ADVANCED RESCUE TRAINING NACELLE, TOWER & BASEMENT RESCUE REFRESHER INCL. WAHR (NTBRR)

Version 1.0
01 October 2018
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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>AS/NZS</td>
<td>Australia and New Zealand Standard</td>
</tr>
<tr>
<td>ART</td>
<td>Advanced Rescue Training</td>
</tr>
<tr>
<td>BST</td>
<td>Basic Safety Training</td>
</tr>
<tr>
<td>CSA</td>
<td>Canadian Standards Association</td>
</tr>
<tr>
<td>EMT</td>
<td>Emergency Medical Treatment</td>
</tr>
<tr>
<td>GWO</td>
<td>Global Wind Organisation</td>
</tr>
<tr>
<td>HSIBR</td>
<td>Hub, Spinner and Inside Blade Rescue</td>
</tr>
<tr>
<td>LOTO</td>
<td>Lock Out Tag Out</td>
</tr>
<tr>
<td>NTBRR</td>
<td>Nacelle, Tower and Basement Rescue Refresher</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>SAR</td>
<td>Search and Rescue</td>
</tr>
<tr>
<td>SRL</td>
<td>Self-Retractable Lifeline</td>
</tr>
<tr>
<td>WAH</td>
<td>Working At Heights</td>
</tr>
<tr>
<td>WTG</td>
<td>Wind Turbine Generator</td>
</tr>
</tbody>
</table>
## DEFINITION LIST

| Clear / precise communication | a. Technician A is giving information to technician B  
|                              | b. Technician B repeats the information  
|                              | c. A confirms that the repetition is correct  
|                              | d. If repetition was not correct the technician starts at “a” again. |
| Flexitime                    | The time that must be utilized in the course, either theory or practical elements, where training provider sees the most valuable for the Delegates. |
| IP                           | Injured person, or ill person – i.e. the affected person requiring first aid treatment and rescue/evacuation |
| PPE                          | Includes Personal Fall Protection Equipment |
| Rescue device setups:        |  
|                              | • Rescue device in stationary mode setup  
|                              | • Rescue device in mobile mode setup  
|                              | • Rescue device in standard mode setup, i.e. the rescue device rigged in the WTG  
|                              | • Rescue device in inverted/reverse mode setup, i.e. the rescue device attached to the injured person (and the rescue device rope’s loaded end is rigged in the WTG) |
| Single rescuer Advanced Rescue operation | When an Advanced Rescue operation is performed by one rescue personnel only. Relevant for personnel working in two-person teams, where Advanced Rescue preparedness is required. |
| Zip line                     | Areal ropeway for injured person transportation. Setup horizontally with a rescue device (Milan) rigged between two structural and/or certified anchor points |
## CHANGE LOG

### Table 1 - Change Log

<table>
<thead>
<tr>
<th>Amendments &amp; Dates</th>
<th>Ver.</th>
<th>Changes</th>
<th>Approved by &amp; Dates</th>
</tr>
</thead>
</table>
| dd-mm-yyyy        | #    | **Cell contents heading**  
Table text  
• Bulletlist table 2 levels  
• Bulletlist table 2 levels  
  – Bulletlist table 2 levels (indented)  
  – Bulletlist table 2 levels (indented)  
Table text (press TAB repeatedly to add more rows) | GWO SC dd-mm-yyyy |
The Global Wind Organisation (GWO) is an association of Wind Turbine owners and manufacturers with the aim of supporting an injury-free work environment in the wind industry. An objective of GWO is to develop common industry training and best practice Standards for health and safety as a vital and necessary way forward to reduce risks for personnel in the wind industry working on site and to reducing environmental risks across Europe and the globe.

The ART Standard was developed in response to the demand for recognizable Advanced Rescue 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 pertaining to the installation, service and maintenance of wind turbine generators and wind power plants.

This Standard describes the requirements for the Nacelle, Tower & Basement Refresher incl. Working at Heights Refresher training that are recommended by the members of GWO.

The members of the Global Wind Organisation (GWO) recognize trained persons as competent within Advanced Rescue in the wind industry and accept the trained person as possessing the required knowledge to conduct rescue operations, in a WTG, using standard wind turbine industry rescue and fall protection. Training is verified through the GWO database WINDA.

Where national legislation sets higher requirements for the specific training, the Training Provider shall incorporate these requirements into the training program.

Additional training may be required for company or country specific reasons.

This standard has been developed by the GWO Training Committee. Disputes and potential non-conformities should be brought to the attention of the GWO Audit and Compliance Committee.

The standard has been approved by the GWO Steering Committee.
GENERAL REQUIREMENT TO GWO NTBRR TRAINING

Upon completion of the Global Wind Organisation (GWO) NTBRR training Delegates will possess the theoretical and practical knowledge required to access and rescue an injured person from the Nacelle, Tower and Basement section.

Target group
Personnel who will be working in the wind industry or related fields, and will have their duties in a wind turbine environment.

Personnel that may need or is selected by their employer to perform advanced rescue or lead an advanced rescue operation, where training according to one or more modules of the GWO Advanced Rescue Training may mitigate the identified risks.

Aims and objectives
The aim of the NTBRR module is to review and build on previously gained knowledge and skills from the ART Nacelle, Tower & Basement training as well as Working at Heights training through theoretical and practical training. Hence, enable Delegates to perform entry-type injured person rescue operations, in a WTG, using industry standard rescue equipment, rescue methods and techniques.

Conformity with other Training
The GWO NTBRR standard sets out minimum requirements.

The modules, learning objectives, lessons and elements may be delivered in the order that fits best for the specific training situation.

Provided the minimum requirements of the NTBRR are met the Training Provider may choose to incorporate delivery of other similar certified training.

Legal requirements
The Training Provider shall identify whether national legislation sets additional requirements for NTBRR or prohibits delivery of certain elements.

If so, the Training Provider shall incorporate these identified requirements in the training.

Duration of NTBRR Module

Table 2 - Duration of Modules excluding meals and breaks

<table>
<thead>
<tr>
<th>Module</th>
<th>Duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nacelle, Tower and Basement Rescue Refresher (NTBRR)</td>
<td>14</td>
</tr>
</tbody>
</table>
Guidance on delivering lesson elements

Within the module timetables, approximate duration of each of the lessons are given. The training provider may choose to deliver elements of the training according to other timetables, as long as the total duration is not reduced, and practical elements are not reduced in length. Theoretical elements may be delivered during the practical exercises when feasible.

Individual exercises can be combined and integrated to create a more challenging scenarios, e.g. connecting the crawl space exercise to the descent exercise into one scenario.

During the exercises the Instructor is free to introduce new elements or change the circumstances of the exercise, to challenge the delegates and to provide a more dynamic scenario. For example, removing equipment, or marking anchor points as defect.

NOTE: If all refresher modules are delivered to the same Delegates, the redundant elements shall be exchanged to other relevant exercises.

Validity period

The NTBRR Module 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 Delegate 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 Delegate must attend the full NTBRR Module(s) to obtain a new training record.

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

Table 3 - Certificate Validity of Course/Modules

<table>
<thead>
<tr>
<th>Course/Modules</th>
<th>Certificate Validity (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nacelle, Tower &amp; Basement Rescue Refresher (NBTRR)</td>
<td>24</td>
</tr>
</tbody>
</table>

Delegate prerequisites for the NTBRR

All personnel participating in NTBRR training shall be medically fit and capable of fully participating.
Training providers shall have a procedure that requires Delegates to sign a statement stating that they are medically fit to participate in the safety training and that they do not suffer from any medical illness or are under influence of any narcotic substance or alcohol. The Annex 2: Medical Self-Assessment Form shall be used if no other equivalent procedure is in place.

Delegates’ signatures testifying to their medical fitness shall be collected prior to the start of the NTBRR course.

Valid GWO ART - Nacelle, Tower & Basement, GWO Working at Heights, GWO First Aid and GWO Manual Handling certificates are prerequisites for participation. Furthermore, Delegates shall have created a personal Delegate profile in WINDA and provide their own WINDA ID prior to completing the NTBRR training.

**Physical demands**

The NTBRR Module is expected to be physically demanding.

If there is any doubt regarding the medical fitness of any Delegate, the Training Provider shall stop training the Delegate and seek a physician’s advice.

Note: Practical exercises shall be designed and delivered solely to meet this Standard and shall not place any physical or mental demands on the Delegates other than those required to meet this Standard.
GENERAL RESOURCES REQUIRED TO DELIVER NTBRR MODULE

The Training Provider shall ensure that Staff, facilities and equipment are in place to support the training of Delegates.

Training Staff

The Instructor shall possess appropriate qualifications and experience to ensure that all training and supportive activities are carried out in accordance with current legislation and current CRITERIA FOR TRAINING PROVIDERS OFFERING GWO TRAINING.

The Instructor must be:

- Trained in instructional/lecture techniques and/or have documented instructional/teaching experience
- Qualified GWO WAH instructor
- Trained in GWO BST/BSTR First Aid and GWO BST/BSTR Manual Handling
- Included in an on-going training program, which includes visits to onshore and/or offshore WTGs (tower, nacelle, hub) prior to instructing ntbRr Modules, to enable them to maintain and update skills related to the ntbRr Modules they instruct. The Instructor shall physically visit the tower, nacelle and hub of WTGs
- Able to apply knowledge and practical skills in alternative rescue methods, techniques and rigging setups compared to those executed by the Delegates during the practical exercises of the ART Modules
- Able to analyse and justify the ART rescue equipment used, uses and limitations of this equipment included.

A person with First Aid qualifications shall be present during all practical training.

All Staff shall possess the appropriate competencies to conduct/assist the elements of training they have been assigned to.

Facilities and Equipment

The full range of facilities and equipment relevant to the modules delivered shall be available during the training. The following facilities criteria shall be adhered to. Turbine manufacturer specifics may limit the application of the training requiring additional methods, techniques and equipment.

Theory training facilities

Facilities shall be designed to enable each Delegate to see, hear and fully participate in the taught subject matter.
Practical training facilities

All facilities shall be maintained and where appropriate, inspected and tested in accordance with current national legislation and manufacturers’ recommendations.

Risk assessments shall be conducted and documented for all training facilities. The Training Provider shall hold the required permits to operate the facilities.

The learning process is facilitated by identical or comparable elements comparing the training environment and the delegates’ working environment. Identical or comparable elements enhances the application of what is learned. The practical training facilities and the training environment are therefore expected to incorporate as many identical or comparable elements to a real wind turbine working environment as possible.

The objective is that the practical training facility should enable each Delegate to individually and/or as part of a team, see, hear and practice the taught subject matter in such a way, that it resembles the working practices in a real wind turbine environment.

The following training facility items will be required for the ART training:

- Mock-up for the “Rescue up” exercises, to simulate basement/tower rescue with anchor point at min. 6.75 m.
- Mock-up to simulate under the gearbox with a max. 60 cm diameter access crawl way into the crawl space, a height between 60 and 30 cm and minimum 200 cm length (Basement/Tower/Nacelle module)
- Mock-up to simulate the nacelle. Drawing B provides dimensions to the GWO recommended Nacelle mock up. The training provider can deviate from the recommended nacelle measures to facilitate a specific turbine design. The nacelle mock-up must be filled with sufficient simulated assets, to create a realistic nacelle. The maximum available contiguous floor space must be less than 3m², excluding walkways of less than 60 cm width. The sides of the nacelle should be designed in such a way as to prevent direct visual contact from within the nacelle to the teams outside of the nacelle
- Structural and certified anchor points
- It is recommended to connect the various mock ups to recreate a realistic sequence. For example, connecting the nacelle mock-up with the hub mock up. Rather than connecting a blade mock up with the nacelle mock up. This would provide a more realistic scenario. However, if there are practical reasons to separate the individual mock ups, then this is allowed. For example, to allow different teams to train at the same time.
Wind turbine environment explained

What is a wind turbine training environment?

To apply what you have learned, e.g. during a course, is a learning process of its own.

This process is facilitated by identical elements comparing the training environment and the delegates’ working environment. Thus, identical elements enhances the application of what you have learned - The more identical elements, the merrier.

As training provider your goal should be to achieve training facilities and a training environment with as many identical elements to a real wind turbine working environment possible.

In addition, “training as you work”, i.e. executing training end-to-end the way delegates should perform in practice, enhances real work behaviour.

So how do you “train as you work” and design a training environment with a high degree of identical elements?

Depending on the delegate’s job and tasks in the wind industry, many technicians work in the wind turbine tower and nacelle – during pre-assembly, erection, commissioning and troubleshooting, or service of the wind turbine.

For access up/down the tower, the tower is in general fitted with ladder sections provided with a vertical fall protection system, and tower section platforms with ladder hatches fitted with certified anchor points for attachment of personal fall protection
equipment. The wind turbine may hold a basement section fitted as mentioned, and primarily holding electrical cabinets.

In the geared type WTG, access in the nacelle is in general limited to narrow pathways along the left or right side of the main shaft and generator etc. These pathways are often “fitted” with mechanical components and the like, as well as steps and small ladder sections due to variations in floor level, as part of the WTG design – increasing the risk of trips and falls. Access between nacelle and hub is possible through low and often very narrow passageways.

To “train as you work“ training should be executed by doing real work tasks end-to-end under the actual working procedures, and/or realistic emergency situation (fire, first aid, evacuation or injured person rescue) end-to-end scenarios, in a wind turbine environment.

Training Equipment

The required equipment for training shall be available and shall fulfil national legal requirements.

The equipment shall be maintained, inspected and tested in accordance with current national legislation and manufacturers’ recommendations. Risk assessments shall be conducted and documented for all training equipment. The Training Provider shall hold the required permits to operate relevant equipment.
UNDERSTAND GWO LEARNING OBJECTIVES

The described learning objectives (expected learning outcome) are the foundation of the course contents and what the delegate performance assessment must be based upon.

Traditionally learning objectives are prepared within three different domains of learning – knowledge, skills and attitude. A learning objective describes the expected learning outcome on completion of a module or a course, within one or more learning domains.

If a learning objective is related to more than one domain of learning, e.g. to knowledge and skills, one learning objective per learning domain is often prepared – to enable a better understanding of the learning objective.

The GWO Training Provider may apply teaching methods (didactics) that are appropriate to the course participants prior training, education and cultural backgrounds, but should always aim to provide course participants ample possibility to perform hands-on demonstrations and learning reflection.

Taxonomy

To formulate a measurable learning objective, taxonomy is used to describe the level of expected learning outcome within a learning domain.

As an example, belonging to the learning domain of knowledge, to have a delegate name or recognize something, as oppose to have him explain it in his own words, or even apply or demonstrate what he has learned – describes different performance levels, i.e. different taxonomy levels.

Different taxonomies are associated with different learning domains, for instance:

Knowledge: such as Bloom’s “cognitive taxonomy”
- Intellectual knowledge, mental skills and procedures

Skills: such as Simpson’s “psychomotor taxonomy”
- Physical skills, cognitive controlled and observable

Attitude: such as Krathwohl’s “affective taxonomy”
- Attitude and feelings to the learning

Selecting a suitable taxonomy level, an action verb expresses the expected behaviour of the delegate, thus describing the taxonomy level of a learning objective.

Action verbs are usually highlighted in bold in this standard. The table below presents the three learning domains with taxonomy level 1-3, provided with associated action verbs applicable in the learning objective wording, defining the taxonomy level. In the Advanced Rescue Training standard, the learning objectives are in general described as level 2 or 3.
<table>
<thead>
<tr>
<th>Knowledge / Remembering</th>
<th>Skills</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Knowledge / Remembering</td>
<td><strong>Perception</strong></td>
<td><strong>Receive</strong></td>
</tr>
<tr>
<td>Memory of facts, terminology, rules, sequences, procedures, etc.</td>
<td>Watch instructor and repeat action, process or activity.</td>
<td>Listening to discussions of controversial issues with an open mind.</td>
</tr>
<tr>
<td>Locating knowledge in long-term memory and retrieving</td>
<td></td>
<td>Respecting the rights of others.</td>
</tr>
<tr>
<td><strong>2</strong> Comprehension / Understanding</td>
<td><strong>Set</strong></td>
<td><strong>Respond</strong></td>
</tr>
<tr>
<td>Construct a meaning from instructional messages, including oral, written and graphic communication.</td>
<td>Awareness or knowledge of the ability needed to use the skill.</td>
<td>Completing work assignments with highly respect to the agreement.</td>
</tr>
<tr>
<td>Demonstrating basic understanding of facts and ideas.</td>
<td>Carry out tasks from verbal or written instructions.</td>
<td>Participating in team problem solving activities.</td>
</tr>
<tr>
<td>Explain in your own words the steps of performing a complex task.</td>
<td>Showing eagerness to assemble components to complete a task.</td>
<td>Questions new ideas and concepts in order to fully understand them.</td>
</tr>
<tr>
<td>Knows and acts upon a sequence of steps in a process.</td>
<td>Participate actively and respectful in discussions.</td>
<td>Showing enthusiasm.</td>
</tr>
<tr>
<td><strong>Action verbs</strong></td>
<td></td>
<td><strong>Action verbs</strong></td>
</tr>
<tr>
<td><strong>3</strong> Application / Applying</td>
<td><strong>Guided response</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>To use in a new situation.</td>
<td>Follows instructions to build a model.</td>
<td>Demonstrates belief in the company described process.</td>
</tr>
<tr>
<td>Solving problems by applying acquired knowledge, facts, techniques and rules in a different way.</td>
<td>Using a tool after observing an expert demonstrate how to use it.</td>
<td>Shows the ability to solve problems.</td>
</tr>
<tr>
<td>Applying a procedure to a familiar or unfamiliar task.</td>
<td>Be able to demonstrate an activity to other learners.</td>
<td>Informs management on matters that one feels strongly about.</td>
</tr>
<tr>
<td>Using a manual to calculate and operate.</td>
<td>Can complete the steps involved in the procedure as directed.</td>
<td>Decide worth and relevance of ideas and tasks.</td>
</tr>
<tr>
<td><strong>Action verbs</strong></td>
<td></td>
<td><strong>Action verbs</strong></td>
</tr>
<tr>
<td><strong>Guided response</strong></td>
<td></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td><strong>Comprehension / Understanding</strong></td>
<td></td>
<td><strong>Receive</strong></td>
</tr>
<tr>
<td><strong>Knowledge / Remembering</strong></td>
<td></td>
<td><strong>Perception</strong></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
<td><strong>Attitude</strong></td>
</tr>
<tr>
<td><strong>Set</strong></td>
<td></td>
<td><strong>Receive</strong></td>
</tr>
<tr>
<td><strong>Guided response</strong></td>
<td></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td><strong>Perception</strong></td>
<td></td>
<td><strong>Receive</strong></td>
</tr>
<tr>
<td><strong>Attitude</strong></td>
<td></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td><strong>1</strong> Knowledge / Remembering</td>
<td><strong>Perception</strong></td>
<td><strong>Receive</strong></td>
</tr>
<tr>
<td>Action verbs</td>
<td>Action verbs</td>
<td>Action verbs</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Arrange, Define, Describe, Find, Identify, List, Name, Outline, Recognize, Relate, Recall, Retrieve.</td>
<td>Recognizing sounds or pictures that indicate certain functionalities.</td>
<td>Listen to others and remember their opinions.</td>
</tr>
<tr>
<td>Estimate the event of a certain function and be prepared for it.</td>
<td>Be positive and creative to what is being taught.</td>
<td></td>
</tr>
<tr>
<td><strong>Action verbs</strong></td>
<td><strong>Action verbs</strong></td>
<td><strong>Action verbs</strong></td>
</tr>
<tr>
<td>Attempt, Copy, Duplicate, Follow, Organize, Repeat, Sketch, Replicate, Reproduce.</td>
<td>Ask, Be open to, Concentrate, Discuss, Focus, Follow, Listen, Reply, Take part.</td>
<td></td>
</tr>
</tbody>
</table>
ADMINISTRATION AND CERTIFICATION OF NTBRR MODULE

Administrative arrangements
Appropriate for the enrolment and certification of Delegates and all aspects of the delivery of training shall be in accordance with this Standard.

Delegate performance assessment
Delegates will be assessed by means of direct observation and supplementary oral questions where appropriate (formative evaluation).

Throughout the entire course the instructor will enforce the Delegate Assessment Form (see annex 2) and adhere to it, accordingly, with a high focus on evaluating the Delegate’s practical skills.

The Trainer keeps a Delegate Assessment Form (or adaptation) for each Delegate until the completion / evaluation of the NTBRR Module.

The Delegate Assessment Form (or adaption) is a final evaluation tool for the instructors to assess Delegates during practical elements. It allows measurement of the number of violations in regard to safety, competency, or attitude.

It shall be used as a progressive evaluation tool to discuss the performance of a Delegate in guiding them to success and it also serves as supporting documentation if a Delegate passes or fails the Module. If a Delegate fails to meet the demands of the NTBRR module, they shall attend a new NTBRR Module.

Training Provider may adapt the Delegate Assessment Form to other media. Training Providers shall have a documented procedure in place for dealing with Delegates not meeting the stated learning outcomes.

Requirement to upload training record in WINDA
Training Providers are responsible for uploading a record of training to WINDA, the GWO online database of training records. This must be done as soon as possible and no later than 10 working days after completion of the training program. The Training Providers are required to upload the ART-NR and WAHR records separately to WINDA.

Each record shall contain the following:

1) Delegate’s WINDA ID
2) Course code
3) Course completion date
Course codes:

<table>
<thead>
<tr>
<th>Nacelle, Tower &amp; Basement Rescue Refresher</th>
<th>ART-NR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working At Heights Refresher</td>
<td>WAHR</td>
</tr>
</tbody>
</table>

The Training Provider shall in accordance with the criteria for Training Provider maintain own records of Delegates.

Upon request from GWO or any of the members of GWO, the Training Provider shall be able to verify the training and competence records of any specific personnel either attending a course and/or performing training of a course by name and nationality.

Training providers may issue other additional proof of training, e.g. as paper certificate or plastic cards. If the training provider chooses to do so, it is recommended (not a requirement) to include the delegate WINDA id.
1.1 Aims and objectives of NTBRR Module

The aim of this module is to review and build on previously gained knowledge and skills from the Nacelle, Tower & Basement module as well as the BST Working at Heights module to enable the delegate to perform injured person rescue operations in a WTG nacelle, tower and basement, by using industry standard rescue equipment, methods and techniques.

The Nacelle, Tower and Basement Rescue Refresher module shall ensure that Delegates are able to:

- Assess and determine rescue strategy (relevant rescue method, technique, certified equipment, and required personnel) for various rescue scenarios, from the nacelle, tower or basement of a WTG
- Assess and determine evacuation strategy during a rescue operation, attending to a clear and preferred evacuation route for the injured person outside or inside the tower
- Explain and demonstrate the identification and suitable selection of certified and structural anchor points, relevant for various rescue scenarios
- Explain and apply the concept of lifting angle, angle factor and deviation
- Explain national and local requirements and/or procedures for helicopter rescue in an WTG, including preparing the injured person, preparing the WTG, the Heli-pad safe zones and safe behaviour included
- Explain and control common risks of hazardous energies and common hazards of enclosed space areas, when performing rescue operations
- Apply rescue methods and techniques in performing descending and ascending rescue operations, from a WTG nacelle, tower and basement, using a rescue stretcher and spineboard, manually and power-driven lowering/raising rescue system (rescue device, pulley system or similar)
- Fit a harness and other PPE (e.g. helmet, safety glasses) onto an injured person, in an enclosed space
- Package an injured person on a rescue stretcher and spineboard in a vertical or horizontal configuration to enable safe transportation, by doing regular checks, using rescue equipment such as cervical collar and avoiding head down configuration of the unconscious injured person.
- Manually transport an injured person on a rescue stretcher or spineboard - in a balanced way
- Change directly from balancing an injured person from a horizontal position to a vertical configuration (and vice versa) when suspended
• Perform rescue operations, in the nacelle, tower and basement, using safe and suitable (certified or structural) anchor points, lifting angles, deviation, and edge protection for the rescue equipment

• Perform rescue operations using the casualties personal fall protection on the injured person - as fall protection backup, when required

• Perform rescue operations in a WTG nacelle, tower and basement using personal flashlight (e.g. helmet light), if required due to poor lighting conditions

• Act as the informal rescue team coordinator performing scene assessment and hazard identification, assessing and determining the rescue strategy and exercising clear communication

• Perform clear and precise communication in a stressful rescue operation, both with members of the rescue team as a team coordinator and as a team member

• Apply clear communication and guidance to other emergency responders (e.g. vessel crew or ambulance crew) including coordinating the handover of an injured person

• Transport an injured person horizontally over the length of the turbine, with the use of industry rescue equipment (zip line)

• Transport an injured person to a higher platform, using rescue up techniques and equipment (both manual and power-driven) in a controlled and secure manner

Delegates will show signs of:

• Acknowledging the benefits of having a coordinator in a rescue team, and the responsibility that comes with it

• Taking part in discussing which advanced rescue preparations, and emergency and communication procedures, apply in their own organization

• Committing themselves to avoid incidents from where they may be exposed to a rescue operation

• Committing themselves to act out this value by demonstrating a pro-active approach and role model behaviour.

1.2 Competencies of the NTBRR Module

Perform ascending and descending rescue operations from an enclosed space in a WTG nacelle, tower and basement, to a primary assembly area (ground or transition piece) or a secondary assembly area (vessel), using industry standard rescue equipment

(Rescue scenarios where the injured person is located on the outside of the nacelle and on the outside of the tower are not included)

• Perform these rescue operations in teams acting as the rescue team coordinator
• Prepare an injured person for helicopter rescue from a WTG.

1.3 Duration of the NTBRR Module
The optimal total time for completing this NTBRR Module is estimated to be 16 hours, including meals and breaks. The focus should lie on the practical exercises where the delegates are encouraged to experiment with the techniques. The role of the training provider should be focussed on guiding the delegates during their efforts, rather than on demonstration.

1.4 NTBRR Trainer/Delegate Ratio
• The ratio shown for theory sessions indicates the maximum number of Delegates that can attend the course
• The ratio shown for practical sessions indicates the maximum number of Delegates to be supervised by one instructor during each activity.

<table>
<thead>
<tr>
<th>Module</th>
<th>Session</th>
<th>Trainer – Delegate Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nacelle, Tower &amp; Basement Rescue Refresher</td>
<td>Theory</td>
<td>1:12</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>1:4</td>
</tr>
</tbody>
</table>

1.5 Equipment for NTBRR Module
The following equipment is required during the entire duration of this NTBRR Training to meet the needs of the NTBRR Training Module:

1) Rescue stretcher
2) Spineboard
3) Cervical collar for rescue purpose
4) Manually operated lowering/raising rescue systems for limited distance rescue:
   4.1 Rescue device, and
   4.2 Pulley system, with rope grab
5) Power-driven lowering/raising rescue system
6) Pulleys
7) Edge protector for rope
8) Tag line
9) Flash light (helmet light)
10) Radios when applicable

11) Rescue dummy min. 50 kg/110 lbs. Dummy preferably with detachable parts for proper manual handling

GWO BST/BSTR Working at Heights related equipment:

1) Full body harness
2) Fall restraint lanyards
3) Fall arrest lanyards
4) Helmets and safety glasses
5) Vertical fall arrest system
6) Self-Retractible Lifeline (SRL)
7) Anchor points (certified and structural)
8) Rescue slings
9) Karabiner with mandatory automatic locking system (minimum dobb./triple lock)

The equipment supplied and used by Staff and Delegates shall follow and comply with national legislation and the appropriate guideline standards, e.g.:

<table>
<thead>
<tr>
<th>Europe - EN</th>
<th>UK - BS</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA - ANSI</td>
<td>Canada - CSA</td>
</tr>
<tr>
<td>Australia and New Zealand - AS/NZS</td>
<td>Asia - ANSI / EN</td>
</tr>
</tbody>
</table>

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

1.6 NTBRR Module Time Table

The order in which the elements of this NTBRR training Module are delivered may vary.

Within the module timetables, approximate duration of each of the lessons are given. The training provider may choose to deliver elements of the training according to other timetables, as long as the total duration is not reduced, and the duration of practical elements is not reduced in length. Theoretical elements may be delivered during the practical exercises when feasible.
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Element</th>
<th>Approximate Duration (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Safety Instructions and Emergency Procedures</td>
</tr>
<tr>
<td></td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instructor &amp; Delegate Presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall Aim &amp; Objectives and Agenda</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On-Going Assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>30 min.</td>
</tr>
<tr>
<td>2</td>
<td>Emergency Response Plan in Your Own Organization</td>
<td>Emergency Response Plan in Your Own Organization</td>
</tr>
<tr>
<td></td>
<td>Evacuation Strategy</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>30 min.</td>
</tr>
<tr>
<td>3</td>
<td>Working at height - Knowledge Review</td>
<td>Falls</td>
</tr>
<tr>
<td></td>
<td>Correct fitting of harness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of fall arrest lanyard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of anchor points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of fall arrest systems and work positioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How to attach a guided type fall arrester</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safe and correct use of a SRL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of rescue and evacuation devices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of inspection of PPE, rescue and evacuation devices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>60 min.</td>
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<tr>
<td>4</td>
<td>Control measures to prevent injury during training (Day 1 + Day 2)</td>
<td>Preparations for today’s training, incl. - Inspection/don PPE - Control measures to prevent injury during training - Warm-up</td>
</tr>
<tr>
<td>5</td>
<td>Working at height - Rescue from Ladder</td>
<td>Safe and correct use of rescue equipment from ladder</td>
</tr>
<tr>
<td>6</td>
<td>Working at height - Self-Evacuation</td>
<td>Safe and controlled self-evacuation</td>
</tr>
<tr>
<td>7</td>
<td>Evacuation of an injured person from the Nacelle to the Base of the Tower</td>
<td>Practical exercise evacuation inside and outside of tower</td>
</tr>
<tr>
<td>8</td>
<td>Rescue from Enclosed Space</td>
<td>Enclosed space rescue - Exercises</td>
</tr>
<tr>
<td>9</td>
<td>Rescue from Crawl Space</td>
<td>Rescue from Crawl Space - Exercises</td>
</tr>
<tr>
<td>10</td>
<td>Rescue Up</td>
<td>Rescue Up - Introduction</td>
</tr>
<tr>
<td>11</td>
<td>Evaluation</td>
<td>Reflection Session</td>
</tr>
</tbody>
</table>
1.7 Detailed description of the Nacelle, Tower & Basement Refresher Module

The learning outcomes specified for the Nacelle, Tower & Basement Refresher Module are:

Note: The administrative part of the registration should be carried out before the course commences.

Lesson 1 - INTRODUCTION

30 min.

The aim of this lesson is to introduce the Delegates to the course, each other, the facilities and what is expected of them during the course.

To successfully complete this lesson of the NTBRR Module, Delegates must be able to:

- Explain the safety rules and emergency procedures of the training facilities
- Locate emergency exits and equipment, and relevant training facilities
- Recognize who the instructor and other Delegates are
- Describe the main aim and main learning objectives
- Explain the on-going assessment according to delegates assessment form.
- State own expectations for the course

ELEMENr 1.1 - SAFETY INSTRUCTIONS AND EMERGENCY PROCEDURES

The Instructor shall explain:

1.1.1 Safety instructions according to internal procedures

1.1.2 Emergency procedures and emergency exits in the areas where the Delegates will be located during the course.

ELEMENT 1.2 - FACILITIES

The Instructor shall give:

1.2.1 A general description of the on-site facilities (Administration, dining area, restrooms, etc.)
ELEMENT 1.3 - INSTRUCTOR & DELEGATE PRESENTATION
The Instructor shall:

1.3.1 Ensure that all Delegates are registered with a personal Delegate profile in WINDA and have provided their WINDA ID prior to completing the training course.

1.3.2 Give a short introduction, including their backgrounds as instructors

Delegates shall:

1.3.3 Give a short introduction, including their job function, onshore/offshore experience, time of employment in the wind industry, and expected primary geographic work location, etc.

1.3.4 Present his/her own expectations for the course.

ELEMENT 1.4 - OVERALL AIM & OBJECTIVES AND AGENDA
The Instructor shall explain:

1.4.1 The main aim, main objectives and agenda of this ART Module, highlighting the rescue team coordinator functionality.

ELEMENT 1.5 - MOTIVATION
The Instructor shall explain:

1.5.1 Why advanced rescue preparedness and skills are relevant

1.5.2 The importance of personal involvement in the course

1.5.3 How the Delegates will be challenged, and why.

ELEMENT 1.6 - ON-GOING ASSESSMENT
The Instructor shall explain:

1.6.1 The reasons for the on-going assessment

1.6.2 The GWO Delegate assessment form and its use

1.6.3 What is expected of the Delegates.
Lesson 2 - EMERGENCY RESPONSE PLAN IN YOUR OWN ORGANIZATION

30 min.

The aim of this lesson is to raise awareness on emergency response planning and evacuation strategy. This is to inspire the Delegates on what information to search for concerning what specific rescue preparations and rescue procedures apply in their own organisation.

To successfully complete this lesson of the NTBRR Module, Delegates must:

- Take part in discussing what specific rescue preparations, and emergency, communication and command procedures, apply in their own organization
- Focus on the limitations of the rescue preparations available, when deciding on the rescue strategy
- Explain what to consider when deciding on evacuation strategy during a rescue operation, attending to a clear and preferred evacuation route for the injured person outside or inside the tower.

ELEMENT 2.1 - EMERGENCY RESPONSE PLAN IN YOUR OWN ORGANIZATION

The Instructor and Delegates shall discuss:

2.1.1 What specific nacelle/tower/basement rescue preparations and emergency and communication procedures apply in their own organization, e.g. concerning:

2.1.2 Number of rescue personnel available (on site) for a rescue operation and availability of additional rescue personnel

2.1.3 Rescue training level depending on your work location in the WTG and number of personnel (e.g. working in the hub, or in the tower)

2.1.4 Communication procedures of operation, e.g. communication to backup/rescue team, Emergency Medical Treatment (EMT) i.e. ambulance and fire service, Site Lead, service vessel, helicopter Search And Rescue (SAR), and the means of communication - radio or phone (cell, IP or satellite phone)

2.1.5 Command procedures of operation, e.g. site lead command or command in rescue team

2.1.6 National and/or local requirements (e.g. confined space regulations and procedures)

2.1.7 Estimated time for professional emergency response providers to arrive

2.1.8 What to be aware of (during this training) concerning what specific elements in their own WTG type/WTG environment might differ from the
training scenario environment (to visualize and enhance learning transfer), e.g.

2.1.9 Turbine design (e.g. layout, pathways, access ways, components, obstacles, hatches, Heli pad)

2.1.10 Anchor points (certified/structural/location)

2.1.11 Rescue equipment (type/quantity/location)

2.1.12 Emergency light (system/equipment).

ELEMENT 2.2 - EVACUATION STRATEGY

The Instructor shall:

2.2.1 Explain how to assess and determine evacuation strategy during a rescue operation, attending to a clear and preferred evacuation route for the injured person outside or inside the tower - by considering the medical condition of the injured person, time constraints, transition piece size and configuration, nacelle position to the wind, evacuation hatch location, and interfering wind speeds, wind directions, temperatures and wind chill factor

2.2.2 Explain how to mitigate transition piece size and configuration, nacelle position to the wind, evacuation hatch location and interfering wind speeds and wind directions, bringing down an injured person by an outside evacuation;

2.2.2.1 From a nacelle to a transition piece - by means of a passive rescue device setup, and tagline if beneficial

2.2.2.2 From a transition piece to a vessel - by means of an active or passive rescue device setup, and tagline if beneficial

2.2.3 Explain the challenges, methods and techniques of evacuating an injured person from a transition piece to a vessel - highlighting pros and cons on passive or active rescue device setup, communication with vessel crew, and procedures and techniques on how to put down the injured person cautiously on a vessel moving up/down in the swell

2.2.4 Demonstrate proper use of a specific rescue device

2.2.5 Demonstrate how to attach and rig the rescue device in passive setup and how to secure the rope

2.2.6 Explain the requirements, applications and limitations of the device

2.2.7 Explain the common additional rope’s length compared to the specific WTG height

2.2.8 Explain/demonstrate the above mentioned based on the manufacturer’s specifications
2.2.9 Explain pros and cons of utilizing a rescue stretcher type with lifting bridles versus a rescue stretcher/spineboard type without lifting bridles versus no rescue stretcher/spineboard, for an outside evacuation.

2.2.10 Explain and demonstrate how to attach and rig the rescue device in a passive and active setup, respectively, and how to utilize a fall restraint lanyard onto the setup to balance the injured person in a perfect horizontal configuration, if required and possible.

2.2.11 Explain how to load the injured person out of the WTG preferably feet first attending to avoid neck/head injury of the injured person due to hatchway opening contact, or load the injured person out of the WTG head first if this risk cannot be mitigated.

2.2.12 Explain how to cautiously manipulate and balance/let go of the injured person out of the WTG when suspended by utilizing a tagline, at the same time aiming to avoid head down configuration of the unconscious injured person - preventing stomach content release.

Lesson 3 - WORKING AT HEIGHT - KNOWLEDGE REVIEW

60 min.

The aim of this course contents is to ensure the delegates are competent in using the required personal fall protection equipment.

To successfully complete this lesson of the NTBRR Module, Delegates must be able to demonstrate:

- Correct pre-use inspection and inspection of personal fall protection equipment, rescue and evacuation devices.
- Correct use of personal fall protection equipment.
- How to attach a guided type fall arrester to the fall arrest system.
- How to correctly utilize a fall arrest lanyard, including attachment to the ladder system.
- How to use a work positioning lanyard in order to leave hands free for work.
- Knowledge of certified and suitable anchor points.
- Different maximum angles that are allowed.
- Safe and correct use of SRL.
ELEMENT 3.1 - FALLS
The Instructor shall explain and demonstrate:

3.1.1 Fall indicators on equipment
3.1.2 How different situations can influence the approach to the rescue, injuries/no injuries
3.1.3 The risk of Suspension Traumas

ELEMENT 3.2 - CORRECT FITTING OF A HARNESS
During the scenario-based training delegates shall demonstrate:

3.2.1 Correct fitting of a harness

ELEMENT 3.3 - KNOWLEDGE OF FALL ARREST LANYARD
The Instructor shall explain and demonstrate:

3.3.1 The difference between a double and twin fall arrest lanyard
3.3.2 How to use double fall arrest lanyard
3.3.3 How to use twin fall arrest lanyard

During the scenario-based training delegates shall demonstrate:

3.3.4 How to attach the fall arrest lanyard to the ladder system in a safe way
3.3.5 Correct attachment to harness

ELEMENT 3.4 - KNOWLEDGE OF ANCHOR POINTS
The Instructor shall explain

3.4.1 The requirements of certified and structural anchor points.
3.4.2 How to identify suitable anchor points.

During the scenario-based training delegates shall demonstrate:

3.4.3 Select and utilize Certified and structural anchor points

ELEMENT 3.5 - KNOWLEDGE OF FALL ARREST SYSTEMS AND WORK POSITIONING
Delegates shall explain and demonstrate:

3.5.1 Compliance of rail/wire systems

During the scenario-based training delegates shall demonstrate:

3.5.2 How to use the work positioning lanyard
3.5.3 Work with free hands, safely and securely

**ELEMENT 3.6 - HOW TO ATTACH A GUIDED TYPE FALL ARRESTER**

The Instructor shall explain and demonstrate:

3.6.1 Safe and correct use of a Self-Retractable Lifeline (SRL) for exercises (a)
   Different types of Self-Retractable Lifeline (SRL) systems that exist and how they are used, what length they come in, and difference between wire - straps

3.6.2 How to apply a Self-Retractable Lifeline (SRL) correctly to the harness, either to the attachment point (A - point) on the back or to the attachment point (A - point) in the front

3.6.3 Different places a Self-Retractable Lifeline (SRL) is allowed to be secured

3.6.4 Importance of using a Self-Retractable Lifeline (SRL)

3.6.5 How to conduct a user inspection and see if a Self-Retractable Lifeline (SRL) is approved, possesses documentation and authorization date

Delegates shall explain and demonstrate:

3.6.6 Legislative requirements

3.6.7 Compliance of rail/ wire systems

During the scenario-based training delegates shall demonstrate:

3.6.8 Correct choice and use of equipment

3.6.9 Correct attachment to rail or wire

3.6.10 Correct attachment to harness

**ELEMENT 3.7 - SAFE AND CORRECT USE OF A SRL**

During the scenario-based training delegates shall demonstrate:

3.7.1 Safe and correct use of a SRL

**ELEMENT 3.8 - KNOWLEDGE OF RESCUE AND EVACUATION DEVICES**

Delegates shall explain:

2.4.1 When and how to use rescue and evacuation devices

2.4.2 Legislative requirements

2.4.3 Requirements for inspection/ certification (vacuum packed/ not vacuum packed)
ELEMENT 3.9 - KNOWLEDGE OF INSPECTION OF PPE, RESCUE AND EVACUATION DEVICES

Delegates shall explain and demonstrate:

3.9.1 How to inspect PPE.
3.9.2 Legislative requirements.
3.9.3 Requirements for certification of PPE

Delegates shall be able to demonstrate, with guidance from the training staff, if required:

3.9.4 How to inspect the rescue and evacuation devices.

Lesson 4 - CONTROL MEASURES TO PREVENT INJURY DURING TRAINING (DAY 1 + DAY 2)

35 min.

The Instructor shall:

- Explain further control measures relevant for the specific training facilities and training to avoid injury during training, e.g.
- Ensure relevant Lock Out Tag Out (LOTO) actions of the relevant training facilities have been conducted, and communicate the LOTO status to the Delegates prior to commencing practical exercises
- Lead a warm-up session of the major muscle groups of the body and ankles, wrists and back ref: annex 3: Guideline for Warm-up exercises.

Delegates shall:

- Perform a user inspection of their Personal Fall Protection Equipment
- Take part in the warm-up of the major muscle groups of the body and ankles, wrists and back.

Lesson 5 - WORKING AT HEIGHT - RESCUE FROM LADDER

80 min.

Live injured person recommended; Exercises in teams of two; 1 exercise per Delegate

The aim of this lesson is to ensure the delegates are competent in performing a rescue operation of an injured person on a ladder.
To successfully complete this lesson the delegates must be able to:

- Utilize their personal fall protection equipment in a safe and appropriate manner on a ladder
- Lower the injured person to the base of the ladder in a safe and controlled manner
- Consider the potential of suspension trauma and take appropriate action.

**ELEMENT 5.1 - SAFE AND CORRECT USE OF RESCUE EQUIPMENT FROM LADDER**

Delegates shall be able to demonstrate:

- **5.1.1** How to perform a safe and controlled rescue from a ladder
- **5.1.2** Correct use of rescue equipment
- **5.1.3** Correct use of personal fall protection equipment
- **5.1.4** Correct use of certified and structural anchor points
- **5.1.5** Appropriate actions to avoid suspension trauma with the injured person.

**Lesson 6 - WORKING AT HEIGHT - SELF-EVACUATION**

35 min.

**1 exercise per Delegate**

The aim of this lesson is to ensure the delegates are competent to perform a self-evacuation from an emergency hatch (The height shall be a minimum of 6.75 m).

To successfully complete this lesson the delegates must be able to:

- Perform a safe and controlled self-evacuation using standard wind industry evacuation equipment, from an emergency hatch (The height shall be a minimum of 6.75 m).

**ELEMENT 6.1 - SAFE AND CONTROLLED SELF EVACUATION**

Delegates shall be able to:

- **6.1.1** Demonstrate as a group correct rigging and attachment of the evacuation device.
- **6.1.2** Apply fall protection at any point when there is a risk from falling from height.
6.1.3 Complete a safe emergency descent, from the emergency hatch (minimum height of 6.75 m.).

Lesson 7 - EVACUATION OF AN INJURED PERSON FROM THE NACELLE TO THE BASE OF THE TOWER

120 min.

Dummy recommended; exercises in teams incl. a team coordinator.

In teams of two-four, 1 inside evacuation exercise per Delegate from nacelle to primary assembly area (ground/transition piece), and rescue device in active setup.

In teams of two, 1 outside evacuation exercise per team - from nacelle to primary assembly area (ground/transition piece), and rescue device in passive setup with tagline.

Each exercise includes: Rescue strategy planning, rescue efforts and Instructor-Led evaluation.

The aim of this lesson is for the delegates to be able to evacuate an injured person in a safe and secure manner to the base of the tower, by lowering the injured person on the inside of the tower.

To successfully complete this lesson, delegates must be able to:

- Assess and determine evacuation strategy during a rescue operation, attending to a clear and preferred evacuation route for the injured person outside or inside the tower
- Explain and demonstrate the identification and suitable selection of certified and structural anchor points, relevant for various rescue scenarios, relevant for various rescue scenarios
- Explain and apply the concept of lifting angle, angle factor and deviation.
- Explain and control common risks of hazardous energies and common hazards of enclosed space areas in a WTG, when performing rescue operations
- Apply rescue methods and techniques in performing descending rescue operations, from a WTG, using a rescue stretcher and spineboard, lowering/raising rescue system (rescue device, pulley system or similar)
- Fit a harness or improvised harness by the use of a rescue sling around the injured person's chest, and other relevant PPE (e.g. helmet, safety glasses) onto an injured person, in an enclosed space
• Package an injured person on a rescue stretcher and spineboard in a vertical or horizontal configuration to enable safe transportation, by doing regular checks, using rescue equipment such as cervical collar and avoiding head down configuration of the unconscious injured person.

• Manually transport an injured person on a rescue stretcher and on a spineboard - in a balanced way

• Change directly from balancing an injured person from a horizontal position to a vertical configuration (and vice versa), when suspended

• Perform rescue operations, in the nacelle, tower and basement, using safe and suitable (certified or structural) anchor points, lifting angles, deviation, and edge protection for the rescue equipment

• Perform rescue operations, using the injured person's personal fall protection on the injured person - as fall protection backup, if required

• Perform evacuation of an injured person from the nacelle to the base of the tower using personal flashlight (e.g. helmet light), if required due to poor lighting conditions

• Act as the informal rescue team coordinator performing scene assessment and hazard identification, assessing and determining the rescue strategy and exercising clear communication

• Perform clear and precise communication in a stressful rescue operation with members of the rescue team as a team coordinator and as a team member

• Perform clear and precise communication to other emergency responders (e.g. vessel crew or ambulance crew) including coordinating the handover of an injured person

• Acknowledging the benefits of having a coordinator in a rescue team, and the responsibility that comes with it

• Taking part in discussing which advanced rescue preparations, and emergency and communication procedures, apply in their own organisation

**ELEMENT 7.1 - PRACTICAL EXERCISE EVACUATION INSIDE AND OUTSIDE OF TOWER**

The Instructor shall:

7.1.1 Highlight specific control measures to prevent injury during training relevant to this specific exercise scenario

7.1.2 Introduce the specific exercise, including (to the extent needed):

   7.1.2.1. Point out a team coordinator for the exercise, and introduce the tasks and responsibilities related to this function

   7.1.2.2. Introduce relevant rescue strategy, method and technique
7.1.2.3. Highlight the considerations to determine where in the WTG to package the injured person on a rescue stretcher/spineboard

7.1.2.4. Highlight what injured person configuration to apply (i.e. horizontal or vertical configuration)

7.1.2.5. Highlight where to attach the lowering/raising rescue system to the injured person or rescue stretcher/spineboard (i.e. harness front or back attachment point). Highlight how to organize the rescue team to the specific rescue operation scenario (who does what)

7.1.2.6. What specific elements/course contents the instructor's assessment will include

7.1.3. Recapture the connected learning objectives/topics for this lesson in the evaluation (i.e. feedback to the Delegates) on completion of the rescue exercise efforts with a focus on:

7.1.3.1. Positive feedback

7.1.3.2. Improvement proposals and alternative solutions

7.1.3.3. Delegates' reflections on what specific elements in their own WTG environment/practice differ from the training scenario environment (to visualize and enhance learning transfer)

7.1.3.4. Delegate's risk mitigation during the exercise

7.1.4. The Instructor shall guide and support the Delegates with applying:

7.1.4.1. Manually operated lowering and raising systems.

7.1.4.2. Fall protection backup of injured person, if required

Delegates shall demonstrate and on request explain, in a team, how to:

7.1.5. Identify and control the specific hazards/risks in the WTG during the rescue operation, e.g. Hazardous energies (mechanical, electrical, hydraulic, pneumatic, magnetic, pressurized substances - i.e. LOTO); Enclosed space areas (hazardous materials, low levels of oxygen); Poor lighting conditions; Dropped objects; Poor manual handling; Temperature/Working conditions (dehydration, heat stroke, exhaustion); Injured person suspension trauma (repetition from GWO WAH put into an advanced rescue context); Slips and trips

7.1.6. Assess and determine evacuation strategy (relevant rescue method, route technique, certified equipment, and required personnel) for a rescue scenario in a WTG

7.1.7. Prepare the injured person for safe transportation (i.e. fit cervical collar, harness and other PPE, and package him on a rescue stretcher or spineboard)
7.1.8 Manually transport an injured person on a rescue stretcher or spineboard - in a balanced way - or by means of a zip line (areal ropeway) when relevant

7.1.9 Attach the rescue device to the injured person in a safe and proper manner

7.1.10 Utilize tagline(s) during one exercise, when performing outside evacuation

7.1.11 Balance an injured person from a horizontal to a vertical position (and vice versa), in order to move the injured person downwards through hatches, or similar

7.1.12 Select and utilize Certified and structural anchor points

7.1.13 Apply the theory of Lifting angle, angle factor, deviation and edge protection

7.1.14 Rig and operate the lowering/raising rescue system in a proper manner aiming to achieve a safe and efficient rigging setup, including the utilization of an injured person personal fall protection equipment backup system

7.1.15 Apply rescue methods, techniques and clear and precise communication in performing safe ascending/descending rescue operations from a WTG

7.1.16 Perform regular checks of the injured person during the entire rescue operation

7.1.17 Perform the rescue effort as a team member or team coordinator

7.1.18 Perform an evacuation (dummy), with the rescue device in a passive setup for evacuation outside of the tower, from the WTG nacelle to a primary assembly area (ground or transition piece)

7.1.19 Perform an evacuation (dummy), with the rescue device in an active setup for evacuation inside the tower, from the WTG nacelle to a primary assembly area (ground or transition piece), carrying the rope bag with him

Lesson 8 - RESCUE FROM ENCLOSED SPACE

110 min.

Dummy recommended; exercises in teams of two incl. a team coordinator; 2 exercises per team.

Each exercise includes: Rescue strategy planning, rescue efforts and Instructor-Led evaluation.
There are several locations on the turbine where work needs to take place with reduced horizontal and vertical space. Such as in the basement/transition piece, yaw section, transformer room or between canopy and generator of a Direct Drive WTG.

The aim of this lesson is for the delegates to be able to apply various techniques to evacuate an injured person from an area with restricted manoeuvrability, filled with sufficient simulated assets, to a location where first aid can be administered.

To successfully complete this lesson, Delegates must be able to:

- Apply the techniques to successfully rescue the injured person from the enclosed space, in a controlled manner
- Assess and determine rescue strategy (relevant rescue method, technique, certified equipment, and required personnel) in an enclosed space scenario
- Explain and demonstrate the identification and suitable selection of certified and structural anchor points, for relevant enclosed space scenarios
- Explain and demonstrate the proper utilization of a specific lowering/raising rescue system, incl. how to properly attach, rig and secure the system, and requirements, applications, limitations and the maximum raising distance possible for the system
- Explain and apply the concept of lifting angle, angle factor and deviation
- Explain and control common risks of hazardous energies and common hazards of enclosed space areas in a WTG, when performing rescue operations
- Apply rescue methods and techniques in performing descending and ascending rescue operations, from a WTG, using a rescue stretcher and spineboard, lowering/raising rescue system (rescue device, pulley system or similar)
- Fit a harness or improvised harness by the use of a rescue sling around the injured person's chest, and other PPE (e.g. helmet, safety glasses) onto a injured person, in an enclosed space
- Assess and determine the suitable attachment point on the injured person and/or spineboard/rescue stretcher, i.e. harness front or back attachment point and in the top or bottom of the spineboard/rescue stretcher
- Perform the rescue operation from the incident scene fully aware of where the injured person is stuck and how to slowly lower/raise the injured person and carefully manipulate him out, constantly evaluating the rescue efforts
- Package an injured person on a rescue stretcher and spineboard in a vertical or horizontal configuration to enable safe transportation, by doing regular checks, using rescue equipment such as cervical collar and avoiding head down configuration of the unconscious injured person.
- Manually transport an injured person on a rescue stretcher or spineboard - in a balanced way
- Change directly from balancing an injured person from a horizontal position to a vertical configuration (and vice versa), in a WTG, when suspended
- Perform rescue operations, in the nacelle, tower and basement, using safe and suitable (certified or structural) anchor points, lifting angles, deviation, and edge protection for the rescue equipment
- Perform rescue operations, in a WTG, using the casualties personal fall protection on the injured person - as fall protection backup, if required
- Perform rescue operations in a WTG enclosed space using personal flashlight (e.g. helmet light), if required due to poor lighting conditions
- Act as the informal rescue team coordinator performing scene assessment and hazard identification, assessing and determining the rescue strategy
- Perform clear and precise communication in a stressful rescue operation, both with members of the rescue team as a team coordinator and as a team member
- Apply clear communication and guidance to other emergency responders (e.g. vessel crew or ambulance crew) including coordinating the handover of an injured person
- Transporting an injured person horizontally over the length of the turbine, with the use of industry rescue equipment (e.g. zip line)
- Acknowledging the benefits of having a coordinator in a rescue team, and the responsibility that comes with it

**ELEMENT 8.1 - RESCUE FROM ENCLOSED SPACE - EXERCISES**

The Instructor shall:

8.1.1 Highlight specific control measures to prevent injury during training relevant to this specific exercise scenario

8.1.2 Introduce the specific exercise, including (to the extent needed):

8.1.2.1. Point out a team coordinator for the exercise, and introduce the tasks and responsibilities related to this function

8.1.2.2. Different rescue strategies, methods and techniques in order to optimize the rescue set up, e.g. refresh how to rig a zip line (areal ropeway) and/or methods/techniques to evacuate from transition piece to secondary assembly area (vessel)

8.1.2.3. To highlight the considerations to determine where in the WTG to package the injured person on a rescue stretcher/spineboard

8.1.2.4. To guide and support the Delegates with exploring different rigging options of attaching the lowering/raising rescue system to the injured person or rescue stretcher/spineboard (i.e. harness front or back attachment point, or attachment point at the foot of the rescue stretcher/spineboard)

8.1.2.5. To highlight what injured person configuration to apply (i.e. horizontal or vertical configuration)
8.1.2.6. To highlight how to organize the rescue team to the specific rescue operation scenario (who does what)

8.1.2.7. What specific elements/course contents the instructor's assessment will include

8.1.3 Recapture the connected learning objectives/topics for this lesson in the evaluation (i.e. feedback to the Delegates) on completion of the rescue exercise efforts with a focus on:

8.1.3.1. Positive feedback
8.1.3.2. Improvement proposals and alternative solutions
8.1.3.3. Delegates' reflections on what specific elements in their own WTG environment/practice differ from the training scenario environment (to visualize and enhance learning transfer)
8.1.3.4. Delegate's risk mitigation during the exercise

The Instructor shall guide and support the Delegates with applying:

8.1.3.5. Manually operated lowering and raising systems.
8.1.3.6. Fall protection backup of injured person, if required.

Delegates shall demonstrate and on request explain, in a team, how to:

8.1.4 Identify and control the specific hazards/risks in the WTG during the rescue operation, e.g. Hazardous energies (mechanical, electrical, hydraulic, pneumatic, magnetic, pressurized substances - i.e. LOTO); Enclosed space areas (hazardous materials, low levels of oxygen); Poor lighting conditions; Dropped objects; Poor manual handling; Temperature/Working conditions (dehydration, heat stroke, exhaustion); Injured person suspension trauma (repetition from GWO WAH put into an advanced rescue context); Slips and trips

8.1.5 Assess and determine the most optimum rescue strategy (relevant rescue method, technique, certified equipment, and required personnel) for a rescue scenario in a WTG

8.1.6 Prepare the injured person for safe transportation (i.e. fit cervical collar, harness and other PPE, and package him on a rescue stretcher or spineboard)

8.1.7 Balance an injured person from a horizontal to a vertical position (and vice versa), in order to move the injured person downwards through hatches, or similar

8.1.8 Apply proper manual handling techniques when transporting the injured person in a balanced and secure way
8.1.9 Select and utilize Certified and structural anchor points

8.1.10 Apply the theory of Lifting angle, angle factor, deviation and edge protection

8.1.11 Rig and operate the lowering/raising rescue system in a proper manner aiming to achieve a safe and efficient rigging setup, including the utilization of an injured person personal fall protection equipment backup system, if required

8.1.12 Apply rescue methods, techniques and precise and clear communication in performing safe lowering/raising rescue operations from a WTG

8.1.13 Perform regular checks of the injured person during the entire rescue operation

8.1.14 Perform the rescue effort as a team member or team coordinator

8.1.15 Show acknowledgement of the added value of having a team coordinator

8.1.16 Conduct a rescue operation in poor lighting conditions

8.1.17 Transport the injured person to the escape hatch by means of a zip line (areal ropeway), to control the handling of injured person more efficiently and reduce manual handling.

Lesson 9 - RESCUE FROM CRAWL SPACE

200 min.

Live injured person recommended; exercises in teams of two-four incl. a team coordinator; min. 6 exercises in total.

Each exercise includes: Rescue strategy planning, rescue efforts and Instructor-Led evaluation.

There are several locations on the turbine were occasionally work needs to take place with strongly reduced vertical space, such as in a transformer room, behind a generator or underneath a gearbox, main bearing or under the floor.

The aim of this lesson is to enable the delegates to rescue an injured person from a crawl space to a location were first aid can be administered.

To successfully complete this lesson, Delegates must be able to:

- Apply the techniques to successfully rescue the injured person from the crawl space, in a controlled manner
- Assess and determine rescue strategy (relevant rescue method, technique, certified equipment, and required personnel) in a crawl space scenario
• Explain and demonstrate the identification and suitable selection of certified and structural anchor points, for relevant crawl space scenarios
• Explain and demonstrate the proper utilization of a specific lowering/raising rescue system, incl. how to properly attach, rig and secure the system, and requirements, applications, limitations and the maximum raising distance possible for the system
• Explain and apply the concept of lifting angle, angle factor and deviation
• Explain and control common risks of hazardous energies and common hazards of crawl space areas in a WTG, when performing rescue operations
• Apply rescue methods and techniques in performing a rescue operation, from a crawl space, covering efforts with and without rescue equipment to ensure the most optimum result
• Prepare the injured person for safe transportation, by doing regular checks, using rescue equipment such as cervical collar and avoiding head down configuration of the unconscious injured person.
• Fit a harness or improvised harness by the use of a rescue sling around the injured person's chest, and other PPE (e.g. helmet, safety glasses) onto an injured person, in a crawl space
• Assess and determine the suitable attachment point on the injured person and/or spineboard/rescue stretcher, i.e. harness front or back attachment point and in the top or bottom of the spineboard/rescue stretcher
• Perform the rescue operation from the incident scene fully aware of where the injured person is stuck and how to slowly lower/raise the injured person and carefully manipulate him out, constantly evaluating the rescue efforts
• Perform rescue operations using safe and suitable (certified or structural) anchor points, lifting angles, deviation, and edge protection for the rescue equipment.
• Perform rescue operations, using the casualties personal fall protection on the injured person - as fall protection backup, if required
• Act as the informal rescue team coordinator performing scene assessment and hazard identification, assessing and determining the rescue strategy
• Perform clear and precise communication in a stressful rescue operation, both with members of the rescue team as a team coordinator and as a team member
• Apply clear communication and guidance to other emergency responders (e.g. vessel crew or ambulance crew) including coordinating the handover of an injured person
• Acknowledging the benefits of having a coordinator in a rescue team, and the responsibility that comes with it
ELEMENT 9.1 - CRAWL SPACE RESCUE - EXERCISES

The Instructor shall:

9.1.1 Highlight specific control measures to prevent injury during training relevant to this specific exercise scenario.

9.1.2 Introduce the specific exercise, including (to the extent needed):

9.1.2.1. Point out a team coordinator for the exercise, and introduce the tasks and responsibilities related to this function

9.1.2.2. Different rescue strategies, methods and techniques in order to optimize the rescue set up

9.1.2.3. To highlight the considerations to determine where in the WTG to package the injured person on a rescue stretcher/spineboard

9.1.2.4. To guide and support the Delegates with exploring different rigging options of attaching the lowering/raising rescue system to the injured person or rescue stretcher/spineboard (i.e. harness front or back attachment point, or attachment point at the foot of the rescue stretcher/spineboard)

9.1.2.5. To highlight how to organize the rescue team to the specific rescue operation scenario (who does what)

9.1.2.6. What specific elements/course contents the instructor’s assessment will include

9.1.3 Recapture the connected learning objectives/topics for this lesson in the evaluation (i.e. feedback to the Delegates) on completion of the rescue exercise efforts with a focus on:

9.1.3.1. Positive feedback

9.1.3.2. Improvement proposals and alternative solutions

9.1.3.3. Delegates' reflections on what specific elements in their own WTG environment/practice differ from the training scenario environment (to visualize and enhance learning transfer)

9.1.3.4. Delegate's risk mitigation during the exercise.

The Instructor shall guide and support the Delegates with applying:

9.1.3.5. Manually operated lowering and raising systems.

9.1.3.6. Fall protection backup of injured person, if required
Delegates shall demonstrate and on request explain, in a team, how to:

9.1.4 Identify and control the specific hazards/risks in the WTG during the rescue operation, e.g. Hazardous energies (mechanical, electrical, hydraulic, pneumatic, magnetic, pressurized substances - i.e. LOTO); Enclosed space areas (hazardous materials, low levels of oxygen); Poor lighting conditions; Dropped objects; Poor manual handling; Temperature/Working conditions (dehydration, heat stroke, exhaustion); Injured person suspension trauma (repetition from GWO WAH put into an advanced rescue context); Slips and trips

9.1.5 Prepare the injured person for safe transportation (i.e. fit cervical collar, harness and other PPE, and package him on a rescue stretcher or spineboard)

9.1.6 Apply proper manual handling techniques when transporting the injured person in a balanced and secure way

9.1.7 Select and utilize certified and structural anchor points

9.1.8 Apply the theory of Lifting angle, angle factor, deviation and edge protection

9.1.9 Rig and operate a manually operated rescue system to horizontally transport the injured person and how to mitigate the challenges of a horizontal rescue enabling a safe rescue operation

9.1.10 Apply rescue methods, techniques and precise and clear communication in performing safe lowering/raising rescue operations from a WTG

9.1.11 Perform regular checks of the injured person during the entire rescue operation

9.1.12 Perform the rescue effort as a team member or team coordinator

9.1.13 Show acknowledgement of the added value of having a team coordinator

9.1.14 Conduct a rescue operation in poor lighting conditions.

Lesson 10 - RESCUE UP

90 min.

Dummy recommended; exercises in teams of two incl. a team coordinator; Min. 3 exercises per team:

- 1 outside rescue up exercises per team; preparing the injured person, rescue up from transition piece outside tower to nacelle/Heli platform, and rescue device in passive setup
- 1 inside rescue up exercise per Delegate; preparing the injured person, rescue up from either basement to primary assembly area (ground/transition piece) or from transition piece inside tower to nacelle/Heli platform, and rescue device in active setup

Each exercise includes: Rescue strategy planning, rescue efforts and Instructor-Led evaluation. Helicopter transport becomes increasingly important for the offshore wind industry. Without the dependency on helicopters for emergency transport, the evacuation route will always be towards the base of the tower. However, emergency evacuation by helicopter transport from a hoisting platform, requires the rescue team to bring the injured person up to the helicopter hoisting platform, rather than to the base of the tower.

The lesson is also relevant for structures with a considerable basement structure and transition piece. Standard evacuation equipment and techniques might not always be suitable for excessive distances rescue up from inside these locations.

The aim is to enable the Delegates to bring their injured person from a lower platform to the higher platform, outside and inside the tower, by the use of a power-driven lowering/raising rescue system.

To successfully complete this lesson, the Delegates shall be able to:

- Assess and determine evacuation strategy during a rescue operation, attending to a clear and preferred evacuation route for the injured person outside or inside the tower, including a high awareness on the risk of the injured person getting stuck in the WTG (e.g. under a tower-tower sections)

- Explain and demonstrate the identification and suitable selection of certified and structural anchor points, relevant for various rescue scenarios, relevant for various rescue scenarios

- Explain and demonstrate the proper utilization of a specific power-driven lowering/raising rescue system, incl. how to properly attach, rig and secure the system, and requirements, applications, limitations, means of tethering and the maximum raising distance possible for the system and associated battery power source

- Explain and apply the concept of lifting angle, angle factor and deviation

- Explain national and local requirements and/or procedures for helicopter rescue in an onshore/offshore WTG, preparing the injured person, preparing the WTG, the helicopter hoisting platform, safe zones and safe behaviour included

- Explain and control common risks of hazardous energies and common hazards of enclosed space areas in a WTG, when performing rescue operations

- Apply rescue methods and techniques in performing rescue up operations in a WTG from basement to primary assembly area (ground/transition piece), from transition piece inside tower to nacelle/Heli platform and from transition piece outside tower to nacelle/Heli platform, using a rescue stretcher and/or spineboard, raising rescue system (power driven rescue system)
- Package an injured person on a rescue stretcher and spineboard in a vertical or horizontal configuration to enable safe transportation, by doing regular checks, using rescue equipment such as cervical collar and avoiding head down configuration of the unconscious injured person.

- Change directly from balancing an injured person from a horizontal position to a vertical configuration (and vice versa), when suspended.

- Perform rescue operations, using the casualties personal fall protection on the injured person - as fall protection backup, if required.

- Act as the informal rescue team coordinator performing scene assessment and hazard identification, assessing and determining the rescue strategy.

- Perform clear and precise communication in a stressful rescue operation, both with members of the rescue team as a team coordinator and as a team member.

- Apply clear communication and guidance to other emergency responders (e.g. helicopter crew or ambulance crew) including coordinating the handover of an injured person.

- Acknowledging the benefits of having a coordinator in a rescue team, and the responsibility that comes with it.

- Utilize a rescue device in a passive setup (i.e. the rescue device fixed in the WTG) during a rescue up operation outside of the tower.

- Utilize a rescue device in an active setup (i.e. the rescue device attached onto the injured person) during an inside rescue up operation inside of the tower/basement.

**ELEMENT 10.1 - RESCUE UP - INTRODUCTION**

The Instructor shall:

10.1.1 Explain the necessity and relevance of this module.

10.1.2 Demonstrate the method of rigging and operating the power-driven devices including relevant technical specifications, requirements, applications, limitations, means of tethering preventing drop and the maximum raising distance possible for the specific complete power-driven lowering/raising rescue system and associated battery power source (fully charged).

10.1.3 Discuss with the Delegates elements to consider when determining the rescue strategy, attending to a clear and preferred evacuation route for the injured person outside or inside the tower. Including:
- exposure of the injured person to weather,
- the potentially dangerous effect of wind pushing the injured person against the tower,
- emotional state of the injured person.
• the medical status of the injured person
• time constraints
• nacelle configuration and position to the wind
• evacuation hatch location
• Obstructions within the evacuation route

10.1.4 Discuss with the Delegates requirements and procedures for helicopter rescue

10.1.5 Highlight the specific limitations of lifting distances of rescue devices, designed for lowering an injured person.

ELEMENT 10.2 - RESCUE UP, INSIDE AND OUTSIDE OF THE TOWER - PRACTICAL EXERCISES

The Instructor shall:

10.2.1 Highlight specific control measures to prevent injury during training relevant to this specific exercise scenario, according to section 1.6 Control measures to avoid injury during training

10.2.2 Introduce the specific exercise, including (to the extent needed):

10.2.2.1. Point out a team coordinator for the exercise, and introduce the tasks and responsibilities related to this function

10.2.2.2. Introduce relevant rescue strategy, method and technique, including active or passive rescue device setup

10.2.2.3. Highlight what injured person configuration to apply (i.e. horizontal or vertical configuration)

10.2.2.4. Highlight how to organize the rescue team to the specific rescue operation scenario (who does what)

10.2.2.5. What specific elements/course contents the instructor’s assessment will include

10.2.3 Recapture the connected learning objectives/topics for this lesson in the evaluation (i.e. feedback to the Delegates) on completion of the rescue exercise efforts with a focus on:

10.2.3.1. Positive feedback

10.2.3.2. Improvement proposals and alternative solutions

10.2.3.3. Delegates’ reflections on what specific elements in their own WTG environment/practice differ from the training scenario environment (to visualize and enhance learning transfer)

10.2.3.4. Delegate’s risk mitigation during the exercise
The Instructor shall guide and support the Delegates with applying:

10.2.3.5. Power-driven raising rescue systems
10.2.3.6. Fall protection backup of injured person.

Delegates shall demonstrate and on request explain, in a team, how to:

10.2.4 Identify and control the specific hazards/risks in the WTG during the rescue up operation, e.g. Hazardous energies (mechanical, electrical, hydraulic, pneumatic, magnetic, pressurized substances - i.e. LOTO); Enclosed space areas (hazardous materials, low levels of oxygen); Poor lighting conditions; Dropped objects; Poor manual handling; Temperature/Working conditions (dehydration, heat stroke, exhaustion); Injured person suspension trauma (repetition from GWO WAH put into an advanced rescue context); Slips and trips

10.2.5 Assess and determine the most optimum rescue strategy (relevant rescue method, technique, certified equipment, and required personnel) for a rescue up scenario

10.2.6 Prepare the injured person (live injured person preferred) for safe transportation (i.e. fit cervical collar, harness and other PPE, and package him on a rescue stretcher or spineboard, respectively)

10.2.7 Balance an injured person (dummy) from a horizontal to a vertical position (and vice versa), in order to move the injured person downwards through hatches, or similar

10.2.8 Select and utilize Certified and structural anchor points

10.2.9 Apply the theory of Lifting angle, angle factor, deviation and edge protection

10.2.10 Rig and operate the rescue up system in a proper manner aiming to achieve a safe and efficient rigging setup, including the utilization of an injured person personal fall protection equipment backup system, if required

10.2.11 Apply rescue methods, techniques and clear and precise communication in performing safe rescue up operations

10.2.12 Perform regular checks of the injured person during the entire rescue operation

10.2.13 Perform the rescue effort as a team member or team coordinator.

10.2.14 Perform a rescue up (dummy), with the rescue device in a passive setup for rescue up outside of the tower

10.2.15 Perform a rescue up (dummy), with the rescue device in an active setup for rescue up inside of the tower/basement.
Lesson 11 - EVALUATION

20 min.

The aim of this lesson is to enable the Delegates 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 his/her way of work. Additionally, the aim is to give the Delegates the opportunity to conduct an open-minded written and oral formative evaluation of the training.

To successfully complete this lesson, Delegates must:

- Show commitment to avoid incidents requiring a rescue operation
- Show commitment to act out this value by demonstrating a pro-active approach and role model behaviour
- Participate in the formative evaluation of the module in a constructive manner

ELEMENT 11.1 - REFLECTION SESSION

The Instructor shall:

11.1.1 Give the Delegates final feedback on the formal Delegate performance assessment and inform them whether they have passed (failed Delegates must be informed individually prior to the reflection session)

11.1.2 Help the Delegate to do a summative self-evaluation, i.e. mentally overview and assort what is learned, identify key takeaways and bridge the gap between what is learned during the module and applying it in his/her way of work. This can be achieved e.g. by an individual reflection session, question session and/or class discussion

11.1.3 Re-present the overall aims and objectives of the course for the Delegates' comparison on their learning outcome and meeting of their previously stated expectations of the course

11.1.4 Give an overall feedback and feed forward on the Delegates' learning outcome

11.1.5 Encourage the Delegates to examine and grow awareness of what specific elements in their own WTG type/WTG environment differ from the training scenario environment (to visualize and enhance learning transfer) and to discuss with colleagues advanced rescue methods and techniques under the local specific conditions identified after course completion

11.1.6 Motivate the Delegates to avoid incidents requiring rescue efforts during daily work and demonstrating a pro-active approach and role model behavior.
ELEMENT 11.2 - FORMATIVE EVALUATION

Delegates shall:

11.2.1 Conduct an online or written formative evaluation of the module, as a minimum

The Instructor shall:

11.2.2 Respond on relevant elements of any oral feedback from the Delegates.
MODULE 2 - HUB, SPINNER AND INSIDE BLADE REFRESHER

Delivery of the Hub Refresher module covers same content, duration, learning objectives as described in the initial Hub module standard.

The Hub module training can consist of first time Delegates and refresher Delegates in the same classroom. The training is designed to allow the more experienced Delegates to contribute more actively and share their knowledge with the refresher Delegates.

Note: If training is conducted with first time Delegates and refresher Delegates in the same classroom then first time Delegates shall receive an ART-H record in WINDA and refresher Delegates shall receive an ART-HR record in WINDA.
### ANNEX 1 - DELEGATE ASSESSMENT FORM (TEMPLATE)

<table>
<thead>
<tr>
<th>Delegate full name as in passport:</th>
</tr>
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<tbody>
<tr>
<td>Delegate WINDA ID:</td>
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<tr>
<td>Course module:</td>
</tr>
<tr>
<td>Date of completion:</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Scenario Organisation</th>
<th>Violation of Assessment Measures</th>
<th>0-2 passed / 3 failed</th>
<th>Instructor Remarks</th>
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</thead>
<tbody>
<tr>
<td>Awareness of personal and group safety at all times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organises and utilises correct equipment for given scenario</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organises individuals and groups as required</td>
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</table>

<p>| Scenario Management | | | |
|---------------------| | | |
| Establishes and maintains control of the exercise scenario at all times | | | |
| Fully participates in the exercise scenario | | | |
| Follows instructions when required | | | |
| Demonstrates correct and safe Manual Handling in exercise scenario | | | |</p>
<table>
<thead>
<tr>
<th>Knowledge and Understanding</th>
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<tbody>
<tr>
<td>Applies subject knowledge correctly in given scenario</td>
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<tr>
<td>Demonstrates understanding of subject</td>
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<tr>
<td><strong>Total Marks</strong></td>
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</tr>
<tr>
<td>0-9 Pass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-27 Fail</td>
<td></td>
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<tr>
<td><strong>PASS:</strong> ☐</td>
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<tr>
<td><strong>FAIL:</strong> ☐</td>
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</tbody>
</table>

Instructor Name (in CAPITAL letters)

Instructor Signature

Training provider
ANNEX 2 - MEDICAL SELF-ASSESSMENT FORM (TEMPLATE)

Your personal health is your own responsibility. Your Training Provider shall not be held responsible for any illness whatsoever during or after the training.

I hereby confirm that I have read and understood the listed risks and potentially life-threatening medical conditions and that I am physically and medically fit to participate in GWO Training. I hereby confirm that there is no factor that will inhibit or affect my participation in GWO Training. I agree to follow all instructions from the appointed Instructor for the duration of the GWO Training. Should there be any doubt regarding my medical fitness, the training provider will stop the training and seek a physician’s advice.

<table>
<thead>
<tr>
<th>Name as in passport</th>
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</thead>
<tbody>
<tr>
<td>Delegate WINDA ID</td>
<td></td>
</tr>
<tr>
<td>Course module</td>
<td></td>
</tr>
<tr>
<td>Signature and date</td>
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</tr>
</tbody>
</table>

The following conditions could pose a risk, when you participate in GWO training

- Asthma or other respiratory disorders
- Epilepsy, blackouts or other fits
- Angina or other heart complaints
- Vertigo or inner ear problems (difficulty with balance)
- Claustrophobia/Acrophobia (fear of enclosed area/height)
- Blood pressure disorder
- Diabetes
- Pacemaker or implanted defibrillator
- Arthritis, osteoarthritis or other muscular/skeletal disorders affecting mobility
- Known allergies (E.g. bee, wasps or spider stings/bites)
- Recent surgery
- Any other medical condition or medication dependency that could affect climbing or physical impact of climbing
## ANNEX 3 - GUIDELINE FOR WARM-UP EXERCISES

<table>
<thead>
<tr>
<th>Body part/major muscle group</th>
<th>Exercise</th>
<th>Duration/repetitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Head rotations:</td>
<td>10 repetitions (five each way)</td>
</tr>
<tr>
<td></td>
<td>• Rotate your head clockwise and counter clockwise</td>
<td></td>
</tr>
<tr>
<td>Shoulders</td>
<td>Shoulders rotation:</td>
<td>10 repetitions</td>
</tr>
<tr>
<td></td>
<td>• Place your legs at shoulder-width</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Feet straight and toes facing forward</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Keep your arms straight at your sides</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Perform both shoulders rotation clockwise and counter clockwise</td>
<td></td>
</tr>
<tr>
<td>Arms</td>
<td>Arm swings and big arm circles:</td>
<td>10 times clockwise</td>
</tr>
<tr>
<td></td>
<td>• Stand up straight with your feet shoulder-width apart</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rotate your arms forward making big circles and then switch rotating backwards.</td>
<td>10 times counter clockwise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 times in opposite directions</td>
</tr>
<tr>
<td>Wrists</td>
<td>Wrist rotation:</td>
<td>10 repetitions for each wrist</td>
</tr>
<tr>
<td></td>
<td>• Perform wrists rotation in both directions</td>
<td></td>
</tr>
<tr>
<td>Torso</td>
<td>Torso swings:</td>
<td>15 repetitions to each side</td>
</tr>
<tr>
<td></td>
<td>• Stand with your legs straight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Place your feet at shoulder-width</td>
<td></td>
</tr>
<tr>
<td><strong>Hips</strong></td>
<td><strong>Hip rotation:</strong></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>• Bend your torso forward 90 degrees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Raise both arms straight to the outside</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Place your hands on your hips and keep your head straight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Perform extensive hips rotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 repetitions clockwise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 repetitions counter clockwise.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Thighs</strong></th>
<th><strong>Squats:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stand with your legs straight</td>
<td></td>
</tr>
<tr>
<td>• Place your feet at shoulder-width</td>
<td></td>
</tr>
<tr>
<td>• Push your hips back and slowly bend your knees.</td>
<td></td>
</tr>
<tr>
<td>• Keep your back straight and your eyes looking forward.</td>
<td></td>
</tr>
<tr>
<td>• Raise yourself back up when your knees reach a 90-degree angle</td>
<td></td>
</tr>
<tr>
<td>15 repetitions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ankle</strong></th>
<th><strong>Ankle rotation:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Place your feet slightly apart</td>
<td></td>
</tr>
<tr>
<td>• Perform rotation for each foot clockwise and counter clockwise</td>
<td></td>
</tr>
<tr>
<td>10 repetitions for each foot</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Back</strong></th>
<th><strong>Back stretch:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Open legs slightly and place hands on the hips</td>
<td></td>
</tr>
<tr>
<td>• Turn to the right and left</td>
<td></td>
</tr>
<tr>
<td>• Incline the back to the right and left</td>
<td></td>
</tr>
<tr>
<td>• Move Back forward and backward</td>
<td></td>
</tr>
</tbody>
</table>