



**RenewableUK**

**APPROVED TRAINING STANDARD**

**Issue 1: 2010**

**Working at Height & Rescue Training- Wind Turbines**

## Editorial & Approval

This standard has been developed in consultation with key industry representatives covering OEM's, developers, training providers, construction and supply chain partners and key industry stakeholders.

The final editorial and approval of this standard has been made by the RenewableUK Training Sub-group subject to ratification of the full RenewableUK Health and Safety Strategy Group<sup>1</sup>.

## Control Log

Amendments & Dates	Version	Changes	Check	Approved
Full Review: 26/02/10	Issue1: 2010	Full Review	OK	C Streatfeild
Full Review: 19/04/10	Issue2: 2010	Ammendment / Correction	OK	C Streatfeild
Full Review: 13/05/10	Issue3: 2010	Ammendment / Correction	OK	C Streatfeild
Full Review: 13/05/10	Issue4: 2010	Ammendment / Correction	OK	C Streatfeild
<b>Final sign off:</b>				
Name	Position	Date	Approved	
C Streatfeild	Director of Health & Safety, RenewableUK	11/08/2010	C Streatfeild	
L Mallon	Chair - RenewableUK Training Group	11/08/2010	Lisa Mallon	

## Disclaimer

It is the responsibility of the sponsoring organisation or individual attending any RenewableUK approved training course to identify what its particular training requirements are and to determine whether any training approved by RenewableUK meets those requirements. Detailed professional advice should be obtained before taking or refraining from taking action in relation to any of the contents of this training standard and any associated training course delivered against this standard.

<sup>1</sup> Note: This is until a new approvals system has been agreed by RenewableUK.

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## Summary of significant changes: Issue 1:2010

This standard encompasses a full revision of the Working at Height Standard, now called Working at Height & Rescue Training Standard endorsed by RenewableUK (previously BWEA). The key changes to the training standard and approvals system applicable to this revised version of the standard are:

- RenewableUK are now responsible for all standards and approvals protocols<sup>ii</sup>;
- The new title of the standard is “Working at Height & Rescue Training - Wind Turbines”;
- All approved training providers are required to demonstrate that training will be delivered in accordance with this standard and the requirements set out in BS 8454:2006 – Code of Practice for the delivery of training and education for work at height and rescue;
- The scope and application of the standard to onsite training has been clarified;
- The minimum height to perform relevant practical exercises has been reduced from 20m to 15m;
- The content and scope of refresher and repeat training has been clarified;
- The recommended minimum time intervals of repeat and refresher has been amended as follows:
  - It is strongly recommended that practical training drills and exercises in rescue techniques be conducted at least **annually**.<sup>iii</sup>
  - Full re-training against the latest version of full standard shall be conducted at least once every 2 years.
- Approved training providers will be subject to revised periodic inspections and audits. These will include:
  - New **annual** reporting requirement by approved training providers to confirm status of administrative and practical arrangements to meet the latest version of the standard;
  - Undergoing an **annual** inspection and audit of a delivered course subject to reasonable notification of available course dates;
  - Full re-accreditation to the standard at least every **3 years**.
  - Provision of a statistical report detailing number of courses held, number of trainees and feedback of course content.
  - The standard will be subject to a full review no later than **3 years** from the date of publication.

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<sup>ii</sup> With effect from 31st December 2009 RenewableUK (previously known as BWEA) took full control of the standards and approvals protocols for all RenewableUK accredited courses.

<sup>iii</sup> Content as per RenewableUK Working at Height & Rescue – Wind Turbine Standard, rescue elements, minimum contact time for practical exercises shall be 4 hours, responsibility for monitoring processes resides with the employing organisation.

## Introduction

### About RenewableUK

RenewableUK (formerly known as BWEA) is the voice of wind and marine energy and the UK's leading trade association representing the interest of the renewable power sector. This standard supersedes all previous standards and in particular the BWEA Working at Height & Rescue Training Standard approved by OPITO.

This training standard has been developed in consultation with key industry representatives covering OEM's, developers, training providers, construction and supply chain partners and key industry stakeholders. The objective is ensuring that all personnel operating in the wind sector are able to demonstrate a common level of basic competency for working at height and rescue within a wind turbine<sup>IV</sup>.

### Overview of the standard

The RenewableUK Working at Height and Rescue – Wind Turbines Standard outlines the basic safety training and competence recommended by RenewableUK for all personnel involved in working at heights in wind turbines. The RenewableUK Working at Height and Rescue – Wind Turbines Standard details the process and methods that shall be used in assessing and certifying competence.

Successful achievement of competency requires personnel to demonstrate, to the required level of theoretical understanding and knowledge, and practical application of skills. The following elements of training and assessment must normally be undertaken as a requirement.

- I. Basic training and assessment of knowledge - Normally to be undertaken at a training establishment or onsite under controlled conditions
- II. Continuous development and skills enhancement – In order to ensure that the competency standards is maintained and developed, accounting for new and changing health and safety hazards and risks
- III. Refresher training & assessment – To take place on a regular basis to ensure basic skills and knowledge level is maintained.

### Scope of the standard

This standard is only intended to address the most significant health and safety training issues as they relate to working at height in wind turbines. It applies to both onshore and offshore activities subject to the jurisdiction of UK health and safety law. It is intended to ensure a common approach to basic training delivered by an approved training provider under controlled conditions.

Due to the variety of the equipment used to work at heights, the variability of turbine design and the differing operating protocols that may be adopted by organizations, duty holders including employers must regularly review the suitability and adequacy of any training provided. This would typically arise out of the risk assessments performed to address working at height and rescue in wind turbines. Where these identify any new or revised risks that could have a significant impact on the safety of work at height the adequacy of training provision should be formally addressed by the duty holder.

This standard sets out:

- The syllabus and arrangements to deliver basic training and competence assessment for work at height & rescue by an approved training provider; and

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<sup>IV</sup> This standard only applies to large wind turbines i.e. those with a swept area of >200m<sup>2</sup> and where the primary means of access to the nacelle is internal to the tower.

- The syllabus and arrangements to deliver refresher, repeat training, and competence assessment for work at height & rescue by an approved training provider.

The standard is intended to apply to all work at height situations applicable across the lifecycle of wind turbine installations. However duty holders should still conduct the necessary risk assessments and training needs analyses to determine the suitability of the standard to the particular risks of the project and turbine.

### **Additional and advanced work at height training**

The specific need for additional training will be dependent on nature of the work at height training that may be performed and the specific design or configuration of a turbine. In particular this standard does **not** address the specific training and knowledge requirements for:

- Hub rescue or rescue within blades;
- Safe working at height and rescue associated with lifts in turbines;
- Safe working at height and rescue associated with climb assist and associated technologies;
- Safe working at height and rescue for turbines where primary access to the nacelle is external to the tower; and
- Any other situation with the potential for work at height or rescue in a wind turbine which involve more complex or extreme hazards or operational circumstances. (E.g. extreme weather; chemical exposures etc.)

General advice on advanced and additional training is set out in Appendix I. This is outside the technical scope of this standard.

### **Approval & Recognition of the Standard**

RenewableUK recommends that anyone who is required to work at height in a wind turbine has received training as a minimum to the syllabus set out in this standard and delivered by a RenewableUK Approved Training Provider.

RenewableUK do not recognise or approve any training carried out outside the scope of this standard and the associated approvals protocols. RenewableUK have provided further details of the suitability and equivalence of other training addressing work at height and rescue delivered outside the scope of this standard. Details are available via [www.Renewable-UK.com](http://www.Renewable-UK.com)

### **RenewableUK Approved Training Providers**

Training providers who have demonstrated they have the competence and management systems to deliver training to the standard will be registered as a Renewable UK Approved Training Provider. They will have been accredited and approved against the scope of this standard and the additional requirements set out in BS 8454:2006 – Code of Practice for the delivery of training and education for work at height and rescue.

### **Trainees**

Trainees who have attended and passed the assessment criteria will be awarded a certificate of basic training for work at height and rescue in wind turbines. This will be recorded as “RenewableUK approved - Working at Height & Rescue - Wind Turbines”. This will be deemed valid for a period up to but not exceeding 2 years from the date of completion.

## Glossary

HSW	Health and Safety at Work etc. 1974
MHSW	Management of Health and Safety at Work Regulations 1999
PPE 2002	Personal Protective Equipment Regulations 2002
PPE	Personal Protective Equipment
PPEW 1992	Personal Protective Equipment at Work Regulations 1992
WTG	Wind Turbine Generator
PUWER	Provision and Use of Work Equipment Regulations 1998
LOLER	Lifting Operations and Lifting Equipment Regulations 1998
RUATP	RenewableUK Approved Training Provider
WAHR	Work at Height Regulations 2005
HSE	Health & Safety Executive

# 1. TRAINING PROGRAMME

## 1.1. Target Group

This training standard is designed to meet the basic training and competence requirements for all personnel working at height on wind turbines. (Note: This standard applies to wind turbines with a swept area of >200m<sup>2</sup> and where the primary means of access to the nacelle is internal to the tower.)

## 1.2. Pre-course requirements

### 1.2.1. Academic & Technical

#### 1.2.1.1. Initial Training

There are no academic or technical pre-requisites for attendance on this course.

#### 1.2.1.2. Refresher & Re-training

Delegates must have a valid and in date RenewableUK approved Working at Height & Rescue training certificate to this standard to participate.

### 1.2.2. Medical & Fitness

All delegates must be able to provide evidence of their capability and medical fitness to undergo the training.

Training providers will be required to demonstrate how this will be carried out (e.g. provision of a suitable questionnaire / self declaration of fitness.) Specific procedures must be in place and recorded to address candidates who have notified the training provider of any relevant health condition.

## 1.3. Training Outcomes

Delegates successfully completing the Work at Height and Rescue training will be deemed to have demonstrated the basic knowledge and competence to work at height in a wind turbine.

### 1.3.1. Aptitude and Capability

Delegates must be able to demonstrate the aptitude and confidence required to work at height. Delegates will complete an assessment of their aptitude to working at height during this course. This will consist of climbing to a vertical height of at least 15 meters' and carrying out a hands free work positioning exercise to demonstrate confidence in the safety equipment. Delegates who have not been deemed competent at this test by the conclusion of the training programme are not eligible for RenewableUK approved certification.

### 1.3.2. Basic technical knowledge

On successful completion of training the delegate will be deemed to have demonstrated basic knowledge and understanding of:

- General health and safety duties of employers to provide training and ensure competence of employees
- Personal responsibilities of employees and the self employed
- Overview of relevant legislation (HSW, WAH, MHSW, LOLER, PUWER, PPE 2002, PPEW 1992)
- Outline of WAH and the principles of a hierarchical approach
- Basic reference and application of ACOPs, standards and guidelines (e.g. HSE, BS/EN)
- Generic safe systems of work (e.g. permits & procedures)
- Wind Turbine Safety Rules (scope & application)
- Risk assessments and control measures for WAH
- Housekeeping risks relevant to for WAH

- Planning of operations for WAH
- Different types of equipment use for WAH
- Equipment pre and post use check, including certification of equipment
- Safe and correct use of equipment for WAH
- Equipment identification and selection for WAH
- Conflicting activities and tasks
- Environmental factors (e.g. weather)
- Manual handling and ergonomics
- Appreciate relevance of different turbine designs (size/layout) to WAH & rescue situations;
- Appreciate relevance of different company/site specific H&S procedures and rules

### **1.3.3. Basic practical skills**

On successful completion of training the delegate will be deemed to have demonstrated individually, basic practical skills and the competence to:

- Safely inspect (prior to use), correctly fit, and use PPE for WAH applications
- Work safely at height in a tower or simulated conditions
- Safely carry out a self rescue in a tower or simulated conditions
- Safely carry out a rescue of a casualty in a tower or simulated conditions
- Safely carry out an assisted lower in a tower or simulated conditions

## **1.4. Training Programme**

The training programme is designed to provide a balance of the knowledge and skills necessary to achieve the level of competence set out in the standard. This will be achieved by a combination of explanation, demonstration and participation of the relevant course element.

Examples include:

- Giving a simple, clear and accurate verbal or written explanation of a key topic (e.g. providing a simple description of PPE used to enable safe working at height);
- Demonstrating a relevant safety technique or method (e.g. the correct selection, fitting and use of PPE to enable safe working at height)
- Practical participation in a relevant technique or safe method of work (e.g. carrying out a basic self rescue.)

## 2. SYLLABUS

### 2.1. WAH Regulations and Hazards

#### 2.1.1.WAH Regulations

Have a basic understanding of:

- Typical accidents relevant to WAH operations
- Legislation related to WAH activities in/on WTGs including
  - WAHR
  - MHSWR
  - PUWER
  - LOLER
  - PPEW92
  - PPE02
  - HASW

#### 2.1.2.WAH Hazards

Have a basic understanding of:

- Hazards associated with WTG activities involving WAH
- Hierarchy of control of hazards for WAH applications
- Conducting a WAH risk assessment
- Safe working procedures for:
  - Pre-entry
  - Entry
  - Ascending & Descending within the tower or base
  - Working in the yaw platform
  - Working in & on nacelle

Delegates to demonstrate and practice:

- Risk assessment of WAH activities
- Safe working procedures during practical activities

### 2.2. WAH Activities

#### 2.2.1.WAH Equipment

Have a basic understanding of:

- Types of ladders and associated fall protection systems in & on WTGs
- Principles of operation of fall protection systems and equipment including:
  - Harnesses
  - Work positioning
  - Work restraint
  - Inertia reels
  - Lanyards & shock absorbers inc. calculation of clearance distances
  - Placement of anchors and suitability of anchor points
  - CE markings and applicable EN standards
  - The principle and methods of 100% attachment
  - WAH PPE and Restraint Equipment

To understand and demonstrate:

- Selection, inspection & use of appropriate PPE to include:
  - Helmet
  - Eye protection
  - Gloves
  - Footwear
  - Harness
- Correct methods of ascending and descending vertical ladders and use of fall protection system
- Selection, inspection and use of work restraint, work positioning and fall arrest equipment
- Correct method of work restraint and work positioning in & on a WTG

## **2.3. WAH Emergencies**

### **2.3.1. Basic Rescue Principles & Techniques**

Give an explanation of:

- Generic WAH emergencies
- Potential emergencies encountered in a WTG
- Cause and effects of suspension syncope
- Principles of operation of WAH rescue devices (rope & mechanical)
- Basic casualty handling considerations<sup>v</sup>

### **2.3.2. Specific rescue techniques**

Give an explanation and demonstration of:

- Raising the alarm. (A range of techniques must be considered.)
- Selection, inspection and use of rescue devices
- Appropriate rescue techniques for recovery of a casualty both conscious (explanation only) & unconscious from;
  - Vertical ladder
  - Nacelle side
- Appropriate casualty handling techniques during and after casualty recovery
- Selection, inspection and use of escape equipment
- An explanation of how to rescue from within or from the side of the hub

Delegates to practice and demonstrate all elements

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<sup>v</sup> This syllabus does not qualify an individual to carry out any specific first aid procedures. These should be determined by the completion of appropriate risk assessments carried out in accordance with relevant health and safety regulations and in particular those arising out of the Health and Safety (First Aid) Regulations 1981 & subsequent amendments and technical guidance issued by the HSE.

### **2.3.3. Rescue of Self and Casualty**

Provide exercises to enable delegates to practise and demonstrate:

- Selecting and using appropriate equipment and climbing/descending 15 metres (minimum)
- Self rescue
- Rescue of a casualty<sup>VI</sup>
- Assisted rescue
- The correct initiation of emergency procedures

Delegates to practice and demonstrate all elements.

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<sup>VI</sup> It is recommended that where ever possible a suitable mannequin is provided and used for staff demonstration and delegate participation of rescue exercises. Where is it deemed by the training organisation's risk management systems that rescue of live personal is required and sufficiently controlled there shall be no single line attachment of any personal involved, there shall be, at all times when working at height, a back up secondary fall arrest system in use, this applies to both demonstration and participation exercises.

## 3. Training – Delivery & Administration

### 3.1. General arrangements

All training must be delivered in accordance with the BS 8454:2006– Code of Practice for the delivery of training and education for work at height and rescue. This includes arrangements covering:

- Management of the training
- Personnel
- Facilities, apparatus & equipment
- First aid
- Course arrangements
- Delivery of training

### 3.2. Specific arrangements

#### 3.2.1. Duration of Training

The optimum contact time for this training and assessment is seen as 16 hours. It is recommended that the ratio of 25% theory to 75% demonstration and practical is appropriate to deliver and assess all modules.

Where this training is part of a programme of longer duration the total contact time per day shall not exceed 8 hours and the total training day shall not exceed 10 hours.

#### 3.2.2. Performance Assessment

Delegates will be assessed against the learning outcomes using direct observation, oral and/or written questions as appropriate.

Training providers must have a policy and procedure in place for dealing with persons not meeting the stated learning outcomes.

Note: Training providers must have suitable procedures in place to assist delegates with learning or physical disabilities. In addition arrangements shall also be provided for delegates where English is not their first language.

#### 3.2.3. Scope & frequency of refresher training

It is recommended that training is regularly reviewed based on the particular capabilities and experience of each individual. The recommended scope and content are set out in Appendix II.

The period for this training shall not normally exceed the following intervals

- It is strongly recommended that practical refresher training in rescue techniques be conducted at least **annually**,<sup>vii</sup>
- Full re-training against the latest version of the full standard shall be conducted at least every **2 years**.

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<sup>vii</sup> Content as per RenewableUK Working at Height & Rescue – Wind Turbine Standard, rescue elements, minimum contact time for practical exercises shall be 4 hours. Responsibility for monitoring processes resides with the employing organisation.

### **3.3. Training Providers – Facilities and Resources**

#### **3.3.1.General Requirements**

All training providers must ensure the requirements set out in BS 8454:2006 – Code of Practice for the delivery of training and education for work at height and rescue are applied as they relate to the specific requirements of this standard.

#### **3.3.2.Personnel**

In addition to the requirements set out in Section 4 of BS 8454:2006, the training provider must demonstrate evidence that training supervisors and trainers can demonstrate evidence of their competence and experience in the following areas:

- Working at height and associated rescue situations
- Practical experience of accessing WTGs'
- Instructional and lecture techniques
- Relevant competence assessment techniques
- A range of WAH equipment that may be used in the industry

All supervisors and trainers must participate in ongoing staff training programmes to maintain and update skills and knowledge.

### **3.4.Trainer/Delegate Ratio**

The ratio shown for theory sessions indicates the maximum number of delegates attending the course. Other ratios indicate the maximum number of delegates to be supervised by an Instructor at any one time during each activity.<sup>viii</sup>

#### **3.4.1.Theory**

- The maximum ratio for theory subjects is: 1 : 12

#### **3.4.2.Demonstration & Practice**

- The maximum ratio for demonstrating or practicing any technique is: 1 : 4

### **3.5.Facilities, apparatus & equipment**

#### **3.5.1.Training facilities**

The requirements for facilities, apparatus and equipment are set out in section 5 of BS 8454:2006. All facilities must be maintained and where appropriate, inspected and tested in accordance with current standards, legislation and manufacturers guidelines. Training providers must have suitable record keeping and audit procedures in place to demonstrate how this is being achieved.

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<sup>viii</sup> Training providers must carryout specific risk assessments to justify a specific ratio for a particular group of delegates and/or task performed. For example low ratios may be appropriate when delegates are being supervised for particular exercises off ground level. The above ratios shall not be exceeded.

### **3.5.2.Equipment**

Training providers must have access to a range of WAH equipment, of a type commonly used in the industry. Where there are numerous alternatives the training provider must also use visual aids to provide further understanding. As a minimum the training facility must have the following equipment:

- A WAH training tower (>15 meters') complete with:
  - Ladder access;
  - Landing platform(s) (at least one >15m)
- Full body harnesses
- Fall arrest equipment
- Lanyards
- Manually adjustable work positioning device
- Full site PPE
- Suspension trauma loops
- Full rescue equipment
- Suitable mannequin (for rescue purposes) (Standard adult 50kg)
- Permanent fall arrest devices (minimum 2 examples)
- Karabiners
- Inertia reel blocks
- Nylon webbing endless loops

Employers or sponsors of delegates bringing PPE other than that provided by the RenewableUK approved training provider must provide a signed self declaration stating that the equipment is in good condition and relevant inspections are up to date. Training providers must refuse its use if it fails a visual inspection.

All equipment must be maintained and where appropriate, inspected and tested in accordance with current standards, legislation and manufacturers guidelines. A copy of all relevant inspection and test records must be produced for verification.

### **3.5.3.On-site Training**

The requirements of this standard apply in full for any training undertaken on-site such as an operational wind farm. However due to the additional risks involved further precautions must be taken. As a minimum the training provider in conjunction with the employer or duty holder responsible for the site must:

- Undertake an inspection visit of the site to ensure that the facilities and arrangements meet the requirements of this standard. This must be documented and must highlight any site specific issues relevant to the safe delivery of the training
- A full risk assessment must be carried in accordance with relevant statutory requirements that addresses site specific health and safety issues
- Appropriate measures must be taken to ensure that any site rules or procedures are complied with. If an additional site induction is required this must not form part of the training delivered in terms of contact time with trainees
- The training provider and client must clarify and agree in writing prior to a course the relevant responsibilities of both parties during the period of training

The training provider must fully document all checks undertaken and records of this activity must be available for any audit performed.

## 4. Course administration

### 4.1. General Requirements

All training providers must ensure the requirements set out BS 8454:2006 – Code of Practice for the delivery of training and education for work at height and rescue are applied as they relate to the specific requirements of this standard. Specifically training providers shall ensure suitable arrangements for:

- Management (BS 8454:2006 – Section 3)
- First Aid (BS 8454:2006 – Section 6)
- Course (BS 8454:2006 – Section 7)
- Delivery of training (BS 8454:2006 – Section 8)
- Review (BS 8454:2006 – Section 10)

This standard does not recognise the delivery of any training outsourced to a 3<sup>rd</sup> party.

### 4.2. Certification

Upon successful completion of the course the candidate will be eligible for a certificate. This shall record:

- The name, address and registered number of the training provider
- Full Course Title: “Working at Height & Rescue Training- Wind Turbines”
- Delegate's Name
- Course Dates
- Unique Certificate Number
- Establishment Signatory
- Reference RenewableUK approval and contact details for verifications purposes

## **Appendix I**

### **Additional and advanced Work at Height & Rescue Training**

This standard does not address the specific training requirements for undertaking additional or advanced training such as those described in the introduction (section.4). Duty holders (e.g. employers, contractors etc.) are however strongly advised to conduct the necessary risk assessments and training needs analyses to address the particular hazards and risks of the project, site or arrangements for the relevant wind turbine taking account of the variety of designs and layouts that exist.

RenewableUK may provide additional guidance on the nature and scope of any training specification or syllabus requirements in the future. In the absence of this guidance training providers and clients including employers are recommended to adopt the following approach:

- No delegate/trainee shall receive any additional or advanced training unless they have a valid Working at Height & Rescue in Wind Turbines certificate;
- Any training programmes delivered where the principle or significant purpose of the training is WAH related should be conducted in accordance with BS 8454:2006.

## **Appendix II**

### **Scope and content of refresher and repeat training.**

#### **1 Practical Refresher Training in Rescue Techniques**

RenewableUK strongly advise that formal refresher training in the rescue techniques set out in this standard are carried out at least **annually**. In order to maximise the quality and relevance of this training it is strongly encouraged that this will normally comprise of onsite training, using equipment and procedures commonly used by and available to the delegate. This should be conducted and assessed by either an approved training provider or any other party familiar with the site and equipment and competent to be able to validate the training provided.

#### **Syllabus**

The content of the refresher training should be identified as a result of completing suitable risk assessments and feedback from any incidents or near misses. As a minimum the training must ensure that all of the elements set out in sections 2.3.2 and 2.3.3 of this standard have been demonstrated and practiced by the trainee.

Suitable assessment criteria must be in place to confirm the delegate has achieved competence in the assessed areas.

#### **Duration of training**

It is anticipated the contact time for this training will be at least 4 hours. It is recommended that the ratio of 10% theory and 90% demonstration and practice are appropriate to deliver the training and assess delegate competence.

#### **2 Repeat training**

All trainees must receive re-training against the current versions of the standard at least every 2 years.

#### **Syllabus**

The refresher training shall ensure that all elements of the current standard are delivered.

Where a group of trainees all hold a valid certificate then it is recommended that the ratio of 10% theory and 90% demonstration and practical are appropriate to deliver and assess the repeat training. In all other cases the requirements are as set out in the standard.