



GLOBAL WIND
ORGANISATION

Domain Specific Training

Guide to Training for Utility Solar PV

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1. Introduction

1.1 Domain Specific Training

All GWO standards are designed to achieve learning objectives, so the participant can demonstrate to their instructor that they have the knowledge, skills, and ability required to work safely in a Utility Scale Solar PV environment.

GWO course modules are therefore designed to match as closely as possible the scenarios a technician will encounter at work in a Utility Scale Solar PV environment. This guide is intended to provide training providers with a guide for ways of achieving the correct level of fidelity necessary for achieving the learning objectives defined in modules of the GWO Solar Training Standards.

1.2 Training for Work – Fidelity During Training

To achieve scenarios that realistically represent the work environment, GWO training dictates a high amount of fidelity to allow participants to interact with risks, hazards and tasks during training, in the same way that they would in the in the work environment.

Fidelity can be defined as, 'the exact correspondence with a fact or with a given quality, condition, or event; accuracy (e.g. the fidelity of the training a task to the execution of task in the work environment).

Table 1.2 outlines the types of fidelity a training provider must consider when developing training plans for the delivery of GWO Solar modules. Additionally, the training provider must also use the GWO Taxonomy Framework when developing training activities to ensure that the amount of fidelity applied to a learning activity corresponds to the correct taxonomic level. The GWO Taxonomy Framework can be found in the Annex 1 of the GWO Requirements for Training.

Type of Fidelity	Definition	Example First Aid	Example Safe Solar Work (MH, FAW & WaH)	Example Installation	Example Electrical
Physical Fidelity	<i>How accurately equipment, tools, and environment resemble the real thing</i>	Realistic training mannequins for CPR and casualty handling	Realistic loads representative of solar installation work, including panels Firefighting equipment representative of the solar workplace WaH equipment and PPE to facilitate pre-use inspections	Using tools and materials representative for solar installation to practise hand skills	Using representative tools, components and testing instruments for solar electrical work to practise effective use of devices
Psychological Fidelity	<i>How well the training evokes the cognitive and emotional demands of the real task</i>	Simulating high-stress emergency scenarios Realistic first aid incidents in utility scale sites	Realistic simulation of team dynamics in a solar workplace environment with human factor pressures for MH and WAH elements Simulating high-stress emergency fire incidents in solar pv utility scale sites	Realistic simulation of team dynamics in a solar workplace environment with human factor pressures and demands for quality work, carrying out repetitive tasks under time pressure for installation deadlines	Realistic simulation of team dynamics in a solar workplace environment with human factor pressures and demands for quality work under time pressure
Functional Fidelity	<i>How closely the training tasks and workflows match the actual job</i>	Realistic emergency response plan representative for a utility scale site	Realistic fire emergency response plan representative for a utility scale site Recreating solar pv utility scale workplace tasks and procedures for managing safety (eg. apply risk assessments, toolbox talks, right to stop work etc.)	Practicing installation tasks using realistic solar array components and following realistic solar installation checklists	Practicing electrical works using realistic solar arrays, electrical cabinets and following safe work procedures & instructions
Contextual Fidelity	<i>How well the setting (layout, weather, team dynamics) mirrors the operational context</i>	Responding to an incident in a remote work location sometimes in small teams relying on limited access to emergency services	Responding to a fire incident in a remote work location sometimes in small teams relying on limited access to emergency services Working in a utility scale environment team context (large teams during installation, small teams during operations)	Using a realistic training prop to represent the solar installation work setting, including all components mounted and connected in a realistic configuration for inspection. This includes representative examples of common faults, errors and issues	Including simulated solar PV systems with mounted panels and interconnected components required for daily operations. This includes representative examples of common faults, errors and issues

Table 1.2: Types of fidelity



1.3 Instructor Familiarisation Programmes

Instructors are a key to ensuring that participants both understand and are prepared to face the risks, hazards and tasks in the environments they will work in. For training to be effective the instructor must be able to close the gaps between the workplace environment and the training setting whilst allowing participants to safely build skills and abilities by engage in learning activities.

As such GWO requires all training providers to develop a familiarisation programme for their instructors. The requirements for this are outlined in the GWO Requirements for Training clause 8.2.2 which reads:

Instructors must be included in a documented ongoing familiarisation programme consisting of either:

- a. visits to work environment relevant to target module(s) prior to instructing GWO modules training, to enable them to maintain and update skills related to the GWO modules they instruct, or
- b. alternative ways of ensuring familiarisation with the working environments the modules were designed for, and updated skills related to the GWO module(s) they instruct

1.4 Developing and Delivering Training Scenarios

When creating scenario-based training activities, the training provider shall take their point of departure in the job performance requirements that participants can expect to find in the real work settings, for example: correct manual handling of solar panels outdoors where the elements (e.g. wind) are a contributing factor to safety and quality.

The training scenarios should incorporate activities that mirror the normal ways of working including safety briefings, reviewing manuals, filling out documentation, stop work procedures, etc. Additionally, the activities required by the scenarios must correspond to the correct taxonomic level described by the learning objectives.

Facilitating scenario-based training

Throughout the facilitation of training scenarios an instructor shall ensure that the focus remains on the performance levels that are required in real work settings, whilst linking activities and learning back to the specified learning outcomes as defined by the GWO Standards related to a Utility Scale Solar PV environment.

During the delivery of training scenarios, the instructors should take on a facilitator role. This means ensuring safety throughout the scenarios, whilst giving participants the opportunity to discover what they are doing and the effect this has on the safety and quality of the task, so that they can make decisions to change their behaviour or reinforce positive behaviour.

Throughout the scenario the instructor should call timeouts to create learning moments, that include, but are not limited to:

- a. Drawing focus to safety and quality
- b. Providing individual and group feedback, e.g. on performance
- c. Assessing participant understanding and engagement
- d. Correctly demonstrate procedures, techniques and how to use equipment



e. Provide time for participants to ask questions and reflect on performance

Note

When introducing new equipment, procedures and methods it is recommended that the instructor use the I.D.E.A.S method:

I – Introduce the tool or method

D – Demonstrate the correct way to use the tool or complete a task

E – Explain what you are doing and why you are doing it

A – Activity where the participants use the tool or complete the task

S – Summary, provide feedback to the participant

Safety during Training scenarios

The instructor is responsible for safety at all times during a training scenario and shall stop the scenario should they deem a situation to be unsafe. The scenario may only recommence once the safety situation has been resolved.



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Solar Training Standards

Module Specific Guidance

15.07



2. Solar Safety Training (S-ST)

2.1 S-ST First Aid

GWO S-ST First Aid module sets the standard for first aid training in the Solar PV industry. A combination of practical and theoretical training provides the skills and knowledge to administer safe and effective first aid and enables work in a safe manner that meets emergency response requirements in accordance with industry needs. The use of scenario-based training is a foundation of GWO First Aid, allowing participants to demonstrate their abilities in as realistic scenario as possible. Such training embraces the knowledge and the skills participants need to be able to assess, assist and provide correct first aid during an incident. With GWO First Aid training, participants are able to demonstrate their ability to:

- Manage incidents by approach and through assessment
- Provide the necessary lifesaving first aid in an incident
- Use first aid equipment correctly
- Display the knowledge and skills for automatic external defibrillator (AED) safety procedures and use an AED correctly

This scenario-based training takes place in groups with one or more participants acting as first aiders, while the others act as casualties or observers. Each participant acts as the first aider at least once. Training providers combine the first aid situations and must include one scenario-based on an electrical incident.

2.2 S-ST First Aid Awareness

GWO S-ST First Aid Awareness module sets the standard for first aid awareness training in the Solar PV industry. The module is shortened version of the S-ST First Aid module and combines practical and theoretical training to provide the skills and knowledge to recognise and administer lifesaving first aid to a casualty in a life-threatening situation. With GWO First Aid Awareness training, participants are able to demonstrate their ability to:

- Manage incidents by approach and through assessment
- Provide the necessary lifesaving first aid in an incident
- Call for help and enable evacuation of a casualty

2.3 S-ST Safe Solar Work

The GWO S-ST Safe Solar Work module sets the standard for preventing and responding to emergency situations in the utility scale solar PV industry. The training provides participants with the knowledge, skills and abilities to safely and prevent and respond to emergency situations relevant to utility scale solar PV work environment. The module includes training in:

- Fire awareness
- Manual handling
- Working at Heights

With GWO Safe Solar Work training, participants are able to demonstrate their ability to:



- Prevent fires and make appropriate judgements when evaluating a fire
- Extinguish an initial fire by using basic handheld firefighting equipment, if the incident is judged to be safe
- Reduce the risk of musculoskeletal injuries
- Perform manual handling tasks and activities in the safest possible way when working in the solar utility scale PV workplace environment
- Recognise work at heights, assess risks and use protective equipment to work safely at heights
- Support a culture of safe work by always keeping the workplace clean and tidy, and applying correct tools for a given task



3. Solar Technical Training (S-TT)

3.1 S-TT Electrical

The GWO S-TT Electrical module sets the standard for working safely with electrical systems in the solar PV industry. The training provides participants with the knowledge, skills and abilities required to connect and commission solar panel system electrical components, and to service and maintain these components during operations. The training covers topics such as:

- Electrical safety
- Electrical components
- Measuring instruments
- Circuits

3.2 S-TT Installation

The GWO S-TT Installation module sets the standard for working safely when installing solar arrays in the solar PV industry. The training provides participants with the knowledge, skills and abilities for installing solar arrays. The module covers key aspects of mechanical prerequisites for installation, assembly of components and electrical assembly. This includes

- A general introduction to solar systems and mechanical components
- Risks and hazards associated with the installation environment
- Basic mechanical completion
- Basic electrical completion



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