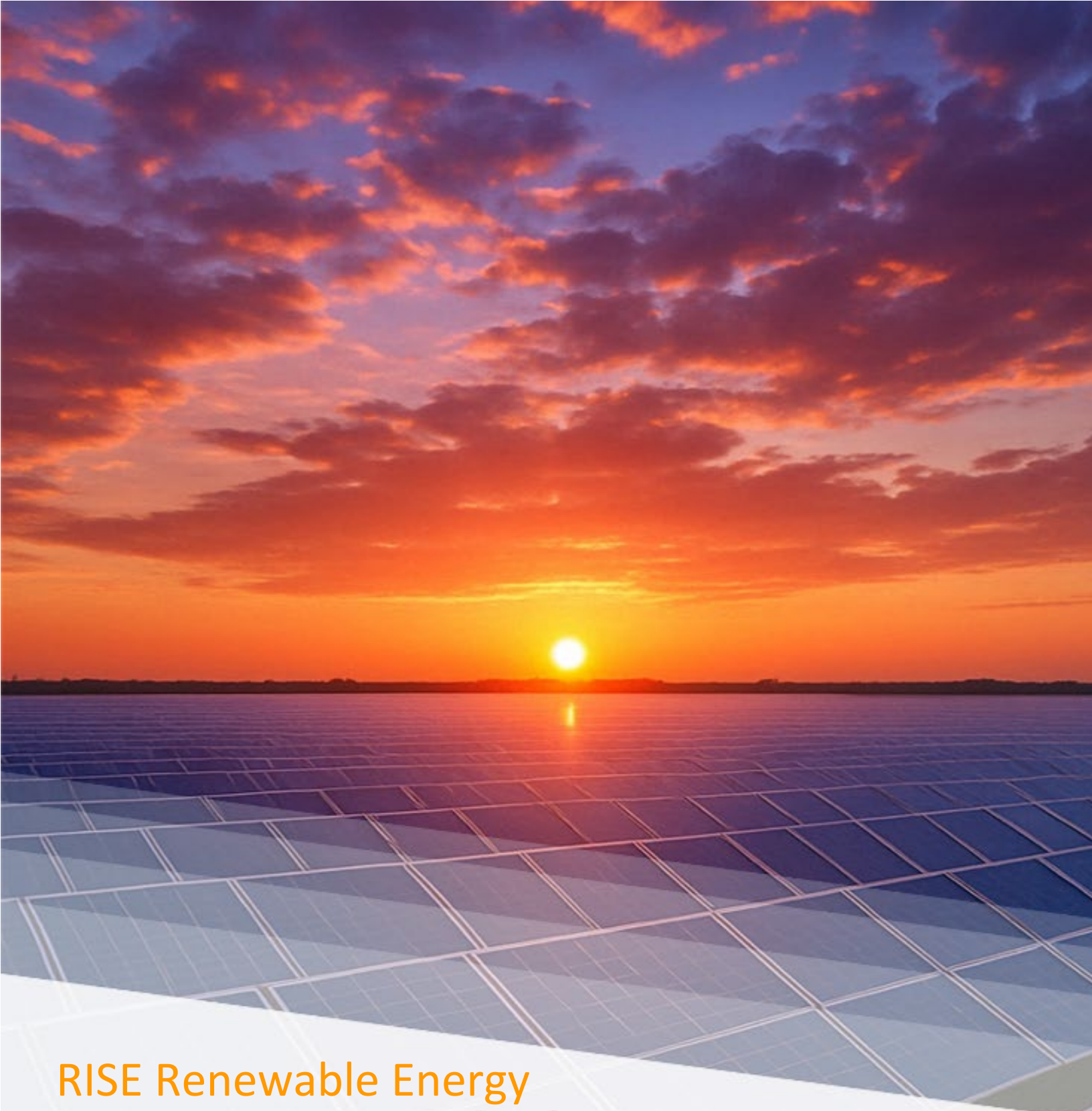

RISE Renewable Energy Training Standard

SYLLABUS

VOLUNTARY TRAINING STANDARD FOR UTILITY-SCALE RENEWABLE ENERGY TECHNITIONS

Developed by

RISE RENEWABLE ENERGY
DEVELOP / TRAIN / SUPPORT

April 2025
Version 1

Legal Statement

Rise Renewable Energy ("RISE"), in collaboration with industry experts, has developed this training program to address key gaps in skills, safety awareness, and training consistency within the utility-scale solar and battery storage sectors. This standard provides a structured curriculum designed to equip new-to-industry employees with essential technical knowledge and safety practices.

This program draws on guidance from nationally recognized regulatory bodies, including but not limited to:

- **OSHA** (Occupational Safety and Health Administration)
- **NFPA 70E** (Electrical Safety in the Workplace)
- **NFPA 70B** (Standard for Electrical Equipment Maintenance)
- **ANSI** (American National Standards Institute)
- **NIOSH** (National Institute of Occupational Safety & Health)
- **DOE** (Department of Energy)
- **DOD** (Department of Defense)
- And insights from experienced professionals across the renewable energy industries.

The training content outlined in this standard is intended as a recommended baseline, not a one-size-fits-all solution.

While RISE may review training programs aligned with this standard for quality and accuracy, we do not assume liability for how the content is interpreted, implemented, or used by individuals or organizations.

This curriculum is educational in nature, covering general technical and safety principles, such as how to perform electrical measurements or select appropriate personal protective equipment (PPE). However, each employer or site operator remains fully responsible for:

- Determining how to apply training content to their specific operations
- Selecting appropriate PPE and procedures for their worksites
- Ensuring compliance with their own policies and applicable regulations

RISE is not liable for any incidents, injuries, damages, or regulatory issues resulting from the use or modification of this training by third parties. Final responsibility for implementation, competency verification, and alignment with jobsite requirements lies with the adopting organization.

Course Description

Course Title: RISE *Solar New-to-Industry (NTI)*

Course Length: 10 Training Days Total, 70 hours student contact time

Course Location: RISE Academy (Classroom & Solar Lab) 414 Bailey Ave. #A Tehachapi CA, 93561

Course Overview: This course is designed to prepare the student for entry level work within a utility scale solar power plant, while being able to identify basic components, and operate safely. This course is presented in English.

Pre-requisites: Students attending this course should meet their individual employer "Qualified Electrical Worker" standard(s) and any additional employment requirements for their company. This *may* include but is not limited to:

- Previous Mechanical or Electrical knowledge gained through previous work experience, military, or post-high school education etc.
- OSHA 10 and/or OSHA 30

RISE will not ask for or verify these certifications unless they have been obtained through RISE. It is the responsibility of the student's employer to determine eligibility for this course.

- Students will need either a laptop or a mobile device (Cell phone) to log in to interactive exams, such as Kahoot!, Microsoft Forms, or Google Forms.

Course Materials: Students will receive course related content, including but not limited to:

- Student Guide
- Other reference material related to course content

Certificates Earned: RISE certificate "Solar *New-to-Industry*"

- Module 1: CPR/AED/First Aid
- Module 2: NFPA-70E Electrical Safety
- Module 3: Site Safety & Job Planning
- Module 4: AC/DC Electrical Theory
- Module 5: Digital Multimeter (DMM) Basics
- Module 6: PV-101
- Module 7: Fasteners and Torquing

Make-up Work: This course is ineligible for make-up work unless otherwise communicated, permitted, and approved by all affected Parties, and extenuating circumstances exist that warrant make-up work.

Course Objective: To ensure the knowledge and skills necessary to be an entry level solar maintenance technician who will demonstrate competency in performing routine inspections, maintain records, repairs, maintenance, safety second duties and general operations within a Utility scale photovoltaic power plant.

Validation(s): Students will be awarded a completion certificate based on the following:

- 100% attendance
- Class participation & contribution
- The written course examination requires an 80% passing grade, two (2) attempts allowed. An alternate version of examination may be presented if students fail their first attempt.
- Hands-on practical verifications: Students will be allowed two (2) attempts at practical examination, with a minimum 80% passing criteria.

Instructional Methods: Blended: Classroom Lecture/Discussion & Hands-On Lab

Instruction Ratio: Blended, with maximum instructor to student ratio of **1:8**.

Course Evaluations: Students are required to complete the student course evaluation that will be distributed to the class during the last day of the course. Evaluations are anonymous and are used to improve future educational content.

Module Learning Objectives

Module 1: CPR-First Aid-AED (1 Day)

Upon completion of this module, participants will be able to:

- Identify signs of cardiac arrest, and unique conditions that exist within a utility scale PV power plant.
- Understand the CPR cycle for adults.
- Perform high-quality chest compressions and provide rescue breaths.
- Work as a team during multi-rescuer CPR scenarios.
- Identify when an AED is needed.
- Power on and operate an AED safely.
- Place AED pads correctly on the victim's chest, Follow Prompts, and ensure safety during shock delivery
- Recognize medical emergencies and understand when and how to activate emergency medical services (EMS).
- Assess a victim's condition using the primary and secondary survey (conscious/unconscious, breathing, bleeding).
- Perform basic first aid for multiple situations and injuries.
- Use a first aid kit effectively.
- Prevent disease transmission through universal precautions and Personal Protective Equipment.

Module 2: NFPA70E (2 Days)

Upon completion of this module, participants will be able to:

- Explain what a "Qualified Electrical Worker" is.
- Explain the purpose of and identify approach boundaries.
- Identify electrical hazards with a PV solar system and fill out a Job Hazard Analysis mitigating those hazards.
- Explain the purpose of Lockout/Tagout and demonstrate proper procedure in locking out an electrical system.
- Identify appropriately rated electrical shock, arc flash, and arc blast personal protective equipment.
- Inspect electrical tooling, protective equipment, and metering for serviceability.
- Demonstrate dawning and doffing electrical personal protective equipment.

Module 3: Site Safety & Job Planning (2 Days)

Upon completion of this module, participants will be able to:

- Explain the purpose of site orientation.
- Describe what an Emergency Action Plan is.
- Demonstrate a simulated site inspection and discuss mitigations.
- Describe what is found on a Safety Data Sheet, and where to find it.
- Explain the reasoning for quality inspections and reporting.
- Explain the purpose of fall mitigation.
- Identify the fall protection hierarchy of controls.
- Identify the trigger height for requiring mitigation of work at height
- Identify governing agencies associated with fall protection requirements.
- Demonstrate an inspection of a portable ladder.
- Identify correct working at height personal protective equipment for different scenarios.
- Demonstrate the correct fit of a fall arrest harness.
- Explain the three different fall factors and their application within the solar industry.
- Explain the proper class of fire extinguisher for job.
- Demonstrate ability to properly inspect a fire extinguisher.
- Explain the hazards associated with fighting a fire for means of egress.
- Participate in a job plan for various utility scale solar job identifying and mitigating unique hazards.

Module 4: Electrical Theory (1 day)

Upon completion of this module, participants will be able to:

- Explain the definition of, and the relationship between voltage, current, resistance, and power.
- Explain the application of ohm's law and watt's law in power generation.
- Explain the difference between AC and DC power.
- Explain the difference between series and parallel circuits.
- Identify the use of common electrical components used in the renewable energy industry.
- Demonstrate the ability to design simple circuits and explain their function.
- Demonstrate voltage, current, and resistance measurements within a series and parallel circuit.

Module 5: Digital Multi-Meter Basics (non-OEM specific), 1 day

Upon completion of this module, participants will be able to:

- Understand common functions of a Digital Multi-Meter.
- Demonstrate the ability to choose the appropriately rated meter for the work environment.
- Demonstrate a physical inspection of a digital multi-meter and determine its serviceability.
- Explain the operational limitations of various styles of meters and demonstrate their proper usage and storge.
- Demonstrate a "Live-Dead-Live" test utilizing a proving unit.
- Demonstrate resistance, continuity, AC voltage, DC voltage, capacitance, and diode measurements.

Module 6: PV-101 2 day

Upon completion of this module, participants will be able to:

- Identify common PV system designs, general components, types and scale.
- Identify general components found on a power conversion station (PCS).
- Identify different PV module types.
- Demonstrate the physical replacement of a solar module.
- Demonstrate the ability to create a solar module connector.
- Demonstrate proper wire management practices on fixed array and tracking PV system.
- Explain safe work practices while working on and around a tracker.
- Identify major components within a Single Axis Tracker system.
- Identify common failure points within a Single Axis Tracker system.
- Identify key differences between commonly used tracker systems.
- Demonstrate ability to correctly use a grease gun and perform general maintenance on a tracking system.
- Explain safe work practices while working in and around an inverter.
- Demonstrate ability to identify major components in an inverter.

Module 7: Fasteners and Torquing 1 day

Upon completion of this module, participants will be able to:

- Explain basic fastener theory.
- Identify various bolts and nuts for their grading and coating.
- Demonstrate an inspection, and storage of a manual torque wrench.
- Demonstrate adjusting and proper use of a manual torque wrench.
- Explain the importance of proper torquing of high current components.
- Explain where to find supporting documentation for various electrical cabinets.
- Demonstrate visual checks, and verification of torque markings.
- Explain friction modifiers and their role in torquing.
- Demonstrate proper preparation of high-current connections.
- Demonstrate proper application of torque
