Course outline: S02 Solar Install K148A
UEENEEK148A - Install, configure and commission LV grid connected photovoltaic power systems

Qualification:	Statement of Attainment issued on successful completion
Applicable to:	Learners, industry/employers, governments, community and Global Energy Training Solutions as the provider
Unit of competency:	Accessible from: http://training.gov.au/Training/Details/UEENEEK148A
Related policies:	Policy & Procedure 1 – Enrolment Policy Policy & Procedure 2 – Credit Transfer & Recognition of Prior Learning Policy & Procedure 3 – Learner Support Policy & Procedure 4 – Assessment Policy & Procedure 5 – Academic Misconduct Policy & Procedure 6 – Alcohol & Other Drugs Policy & Procedure 7 – Access, Equity & Diversity Policy & Procedure 8 – Vulnerable People Policy & Procedure 9 – Work, Health & Safety Policy & Procedure 10 – Incident, Injury & Rehabilitation Policy & Procedure 11 – Competency, & Qualification Assessment Decisions Policy & Procedure 12 – Complaints & Appeals Policy & Procedure 13 – Privacy Policy & Procedure 14 – Fees Policy & Procedure 15 – Industry & Employer Engagement Policy & Procedure 16 – Trainers & Assessors Policy & Procedure 17 – Administration & Other Staff Policy & Procedure 18 – Quality Assurance Policy & Procedure 19 – Business & Financial Risk Management Policy & Procedure 20 – Changes to Qualifications or Business Policy & Procedure 21 – Conflict of Interest Policy & Procedure 22 – Records Management Policy & Procedure 23 – Marketing & Advertising
Monitor and review:	Policy and Procedure 18 – Quality Assurance
Responsibility:	Ben Murphy – as Proprietor
Questions/queries:	Feedback and suggestions welcomed: office@gets.com.au (+61) 02 6262 0077

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1. Material requirements

- Internet access (provided)
- Scientific calculator, ruler, pens and pencils
- Note book
- Hand tools
- Covered footwear

2. Course formats

(2 days total, 5 days for all 3 units of Competency)

Weekend course (over 4 weekends)				**Weekday course – Block (over 1 week)**			
Session	**Times**	**Time of day**	**Week day**	**Session**	**Times**	**Time of day**	**Week day**
(Following Solar Basic)				(Following Solar Basic)			
Session 1	5 pm – 8:30 pm	Evening	Friday	Session 1	1 pm – 4 pm	Afternoon	Tuesday
Session 2	8 am – 12 pm	All day	Saturday	Session 2	8 am – 12 pm	All day	Wednesday
Session 3	1 pm – 4 pm			Session 3	1 pm – 4 pm		
Session 4	5 pm – 8:30 pm	Evening	Friday	Session 4	8 am – 12 pm	Morning	Thursday
(Solar Design starts following Session 3)				(Solar Design starts following Session 3)			

Weekday course – 1 day per week (over 5 weeks)				**Other pathways**
Session	**Times**	**Time of day**	**Week day**	
(Following Solar Basic)				RPL and Assessment only pathways available by application.
Session 1	1 pm – 4 pm	Afternoon	TBA	
Session 2	8 am – 12 pm	All day	TBA	
Session 3	1 pm – 4 pm			
Session 4	8 am – 12 pm	Morning	TBA	
(Solar Design starts following Session 3)				

3. Session activities/tasks

Session	Length	Description			
Session 1	3 - 4 hours	Slide set 1 of 2			
Session 2	3 - 4 hours	Slide set 2 of 2	Work sheet 1 of 5	Work sheet 2 of 5	Work sheet 3 of 5
Session 3	3 - 4 hours	Work sheet 4 of 5	Work sheet 5 of 5	Practical assessment	
Session 4	3 - 4 hours	Theory assessment	Simulated work place assessment		

4. Slide sets

Item	Description	When
Slide set 1 of 2	Inverters	Session 1
Slide set 2 of 2	Installation	Session 2

5. Work sheets

Item	Description	When
Work sheet 1 of 5	Wire components according to AS4509 and AS5033	Session 1
Work sheet 2 of 5	Blocking and bypass diodes	Session 2
Work sheet 3 of 5	Strings and arrays	Session 3
Work sheet 4 of 5	Standards	Session 4
Work sheet 5 of 5	Commissioning and maintenance schedule	Session 5

6. Assessments

Assessment	Description	When	Pass mark
Theory assessment	Multiple choice theory assessment	Session 4	70% overall, 50% in each Competency Point section
Practical assessment	Standards + legislation	Session 3	70%
Simulated work place assessment	Bolt panels on roofs x 3 + connect to inverters	Session 4	100%
Note: Once theory, practical and simulated work place assessments are complete, competency assessment decisions can be made in conjunction with the learner, registered training organisation and employer where applicable.			

7. Version control

Version	Date of release	Author	Authorised by	Position	Reason for change
V2	7/2/2017	Ben Murphy	Ben Murphy	Proprietor	Initial release. Version number consistent with full Course outline review version release.

8. Detailed session breakdown

GETS Competency Point Number and Description		Covered in session No #	Training materials		Assessments materials 'Y' for 'N'		
			Slide set No #	Worksheet No #	Theory Questions	Practical Questions	Simulated Workplace
IC1	Describe the basic characteristics of an inverter	1	1	-	Y	-	-
IC2	Identify the Australian standard symbol for a low voltage inverter	1	1	-	Y	-	-
IC3	Describe the essential properties for grid connected inverters	1	1	-	Y	-	-
IC4	Label the block diagram of a grid connected inverter	1	1	-	Y	-	-
IC5	Using a switch analogue, describe an inverter’s basic operating principles	1	1	-	Y	-	-
IC6	Describe the basic features of FET switched inverters	1	1	-	Y	-	-
IC7	Measure an inverter’s parameters under various loads	1	1	-	Y	-	-
IC8	Describe the basic features of PWM techniques	1	1	-	Y	-	-
IC9	Identify the waveforms of square, modified square and sine wave inverters	1	1	-	Y	-	-
IC10	Identify the typical output voltages and periodic times in C9	1	1	-	Y	-	-
IC11	List the 6 essential specifications for typical grid connected inverters	1	1	-	Y	-	-
C1	Using OHS regulations, identify risks involved with a new installation	K125A	-	-	-	-	Y
C2	Record any unexpected safety issues and deal with them accordingly	K125A	-	-	-	-	Y
C3	Describe the rafters and batterns method of fixing roof materials	2	2	-	-	-	Y
C4	Describe methods used to maintain roof waterproofing	2	2	-	-	-	Y
C5	Describe common panel mounting and tilt adjustment methods	2	2	-	-	-	Y

GETS Competency Point Number and Description		Covered in session No #	Training materials		Assessments materials 'Y' for 'N'		
			Slide set No #	Worksheet No #	Theory Questions	Practical Questions	Simulated Workplace
C6	Deal with difficult roof orientations and aesthetic requirements	2	2	-	-	-	Y
C7	Wire components according to AS4509 and AS5033	2	-	1	-	Y	Y
C8	Describe methods used to minimise power losses due to shading	2	2	-	-	Y	-
C9	Describe where and why blocking and bypass diodes are to be used	2	2	2	Y	Y	-
C10	Locate control and metering equipment in appropriate locations	2	2	-	-	-	Y
C11	Select cable routes to minimise cable runs	2	2	-	-	N	Y
C12	Plan for a new installation with clients, other trades and significant regulations	2	2	-	-	Y	Y
C13	Coordinate the ordering and delivery of materials needed for a new installation	2	2	-	-	-	Y
C14	Select and obtain all the tools and equipment needed for a new installation	2	2	-	-	-	Y
C15	Ensure new work occurs without damage to existing structures	2	2	-	-	Y	Y
C16	Use correct isolation and shutdown methods in accordance with AS4509	2	2	-	-	Y	Y
C17	Provide schedules for, and perform regular maintenance on arrays	2	-	5	-	Y	-
C18	Perform regular vegetation control to minimise array soiling and shading	2	2	-	-	Y	-
C19	Label a block diagram of a typical PV grid connected system	2	2	3	Y	-	-
C20	Describe the required sub-systems for a correctly installed PV grid connected system	2	2	3	Y	-	-
C21	Use the schematic diagrams for a new PV grid connected system, to ensure AS 4777.1 compliance	3	-	4	-	Y	-
C22	Use AS4509, AS4086.2, AS/NZS 3000 and relevant OH&S guidelines to ensure correct operation, long life, safety and ease of maintenance	3	-	4	-	Y	-

GETS Competency Point Number and Description		Covered in session No #	Training materials		Assessments materials 'Y' for 'N'		
			Slide set No #	Worksheet No #	Theory Questions	Practical Questions	Simulated Workplace
C23	Select suitable locations for system components, with AS2676.2, AS3011.2, AS4509 and AS4086.2 guidelines	3	-	4	-	Y	-
C24	Describe the function and operation of a grid protection devices, as specified in AS4777	3	-	4	-	Y	-
C25	Installation requirements for a grid connection and UPS system as specified in AS 4777.1	3	-	4	-	Y	-
C26	Install a PV grid connected system	3	-	4	-	Y	-
C27	Test a grid connected inverter system for correct operation	2	2	-	-	-	Y
C28	Locate and rectify any faults within a PV grid connected system	K125A	-	-	Y	-	-
C29	Commission a new installation according to AS4509, AS4086.2, AS/NZS3000 and AS3010.1	3	-	5	-	-	Y
C30	Work site is left clean and made safe in accordance with all regulations	4	-	-	-	-	Y
C31	Test, verify and provide as-installed documentation	3	-	5	-	-	Y