

**ASSESSMENT
MATERIAL****EVIDENCE
GUIDE****Qualification**

LEN0123.v1

Level: 3**Credit: 20****Version: 1****LEN00123F.v1 Install and commission
off-grid solar PV system****CONTENTS**

1. Assessment Summary and Record
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**ASSESSMENT AND
ASSESSOR
DETAILS****Competent**☐**Not Yet Competent**☐**Assessment**☐**Re-Assessment**☐**Assessor Name:****Assessor Code****Assessor Signature****Date**

DD		MM		YYYY					

**CANDIDATE
DETAILS****Candidate Name:**

First Name

Last Name

Father Name**Institute Name and
District****CNIC/BFORM #****OR****Registration Number:****Gender**Male ☐Female ☐**Candidate Consent**

I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.

Candidate Signature:**ASSESSMENT
RESULTS
SUMMARY FORM**You can use this coversheet as an *Assessment Results Summary Form*. Simply post a photocopy of this completed coversheet to **NAVTTTC**

NAVTTTC OFFICE ONLY

**1. DATE
FORM
RECEIVED:**

DD		MM		YYYY					

**2. DATE ENTERED INTO
DATABASE:**

DD		MM		YYYY					

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ASSESSMENT SUMMARY & RECORD

CANDIDATE NAME:					FATHER NAME:		
ACTIVITY		METHOD			DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: INSTALL AND COMMISSION OFF-GRID SOLAR PV SYSTEM	COMPETENT	NOT YET COMPETENT
Practical skill demonstration			✓		Install and commission the off grid 1 KW solar PV System		
Knowledge Assessment		✓			Answer any questions your assessor may have for you during the practical skill demonstration		
Other Requirements	✓	✓	✓	✓	- All candidate module reports completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers - All work completed as module assignments including; ✓ Work related documents and procedures		

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CANDIDATE ASSESSMENT

Candidate Name:

Father Name:

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following practical tasks within set timeframe of five hours:

- Prepare the Plan for installation Install and commission the off grid 1 KW solar PV System
- Mount a photovoltaic array on a roof for PV Module
- Install and commission solar photovoltaic array
- Install Converter Module for AC Load
- Carry out operational checks
-

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical assessment of installing and commissioning off-grid 1 KW solar PV system under observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly carry out: • Prepare the Plan for installation and commissioning of the off grid 1 KW solar PV System. ✓ Follow safety rules as per SOP, s. ✓ Choose suitable location for the PV array and other components. ✓ Obtain tools, equipment and testing devices. ✓ Specify installation requirements for all system components to ensure correct operation, long life, safety and ease of maintenance. • Mounting a photovoltaic array on mounting structure at a roof ✓ Interpret and confirm installation in terms of roof construction and suitable mounting methods ✓ Choose appropriate array frame for the roof type and determine and set correct tilt angle adjustments ✓ Use correct fixing and waterproofing methods appropriate for the roof type • Installing and commissioning solar photovoltaic array ✓ Install system components in suitable location ✓ Connect PV panels and electrical components and minimise cable route length to minimise power loss ✓ Arrange for earthing ✓ Commission off-grid solar PV system to confirm installation • Carrying out operational checks ✓ Test the load of 1 KW and adjust loading component i.e. Search Lights of 1 KW and/or parts ✓ Confirm operation of PV system ✓ Complete work related documents and procedures ✓ Perform final quality inspection ✓ Clean up and store tools, equipment and materials ✓ Carry out customer induction on installed off-grid solar PV system
2. Complete knowledge assessment	Answer all questions my assessor may have during the practical assessment
3. Other requirements	• All candidate module reports completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers • All work completed as module assignments including: ✓ Material estimates ✓ Documented wiring test results ✓ Work related documents and procedures

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ASSESSOR JUDGEMENT GUIDE

Candidate Name:

Father Name:

INSTRUCTIONS FOR ASSESSOR

THIS SECTION CONTAINS MINIMUM EVIDENCE REQUIREMENTS.

The supplied off-grid solar PV system requiring installation and commissioning must meet the evidence requirements of the candidate's competence in installing and commissioning off-grid solar PV system

Set timeframe for practical skill demonstration must reflect the commercially viable timeframe for the tasks.

Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Completed practical assessment of installing and commissioning off-grid 1 KW solar PV system under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out:		
	Prepare the Plan for installation Install and commission the off grid 1 KW solar PV System		
	✓ Identify and obtain safety and other regulatory requirements for installation		
	✓ Choose suitable location for the PV array and other components		
	✓ Obtain tools, equipment and testing devices		
	✓ Specify installation requirements for all system components to ensure correct operation, long life, safety and ease of maintenance		
	Mounting a photovoltaic array on mounting structure at a roof		
	✓ Interpret and confirm installation in terms of roof construction and suitable mounting methods		
	✓ Choose appropriate array frame for the roof type and determine and set correct tilt angle adjustments		
	✓ Use correct fixing and waterproofing methods appropriate for the roof type		
	Installing and commissioning solar photovoltaic array		
	✓ Install system components in suitable location		
	✓ Connect PV panels and electrical components and minimise cable route length to minimise power loss		
	✓ Arrange for earthing		
	✓ Commission off-grid solar PV system to confirm installation		
	Carrying out operational checks		
	✓ Test the load of 1 KW and adjust loading component i.e. Search Lights of 1 KW and/or parts		
	✓ Confirm operation of PV system		
	✓ Complete work related documents and procedures		
	✓ Perform final quality inspection		
	✓ Clean up and store tools, equipment and materials		

	✓ Carry out customer induction on installed off-grid solar PV system • Prepare the Plan for installation Install and commission the off grid 1 KW solar PV System ✓ Identify and obtain safety and other regulatory requirements for installation			
2. Knowledge assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. <i>Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attached.</i>			
3. Other requirements	• Candidate provided all module reports completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers • All work completed as module assignments including: ✓ Work related documents and procedures			

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LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

Instructions	This section contains information regarding; - Context of the assessment - List of required tools and equipment. - List of consumable items required during the service
1. Context of Assessment	This practical skill demonstration will be conducted in a Building Electrician's lab/workshop environment The Assessor will select the required tools, equipment and consumables from the list below for the assessment

2. List of tools and equipment required		
S. No	Tools and equipment	Quantity
1	Personal protective equipment	As Required
2	Fire extinguishers	As Required
3	First aid box	As Required
4	Adjustable wrench	As Required
5	Amp meter	As Required
6	AVO meter	As Required
7	Batteries	As Required
8	Battery charger	As Required
9	Bench vice	As Required
10	Ceiling hole cutter	As Required
11	Charge controller	As Required
12	Chisel	As Required
13	Clamp on meter	As Required
14	Compass	As Required
15	Cutter	As Required
16	Drill machine	As Required
17	Earth tester meter	As Required
18	Extension board	As Required
19	File set	As Required
20	First Aid box	As Required
21	Gloves	As Required
22	Goggles	As Required
23	Grinder	As Required
24	Hammer	As Required
25	Hand drill machine	As Required
26	Helmet	As Required
27	Herts meter	As Required
28	Hex saw	As Required
29	Knife (cable)	As Required
30	Level	As Required
31	L-key set	As Required
32	Lock pliers	As Required
33	Measuring tape	As Required
34	Megger meter (Analog & Digital)	As Required
35	Micrometer	As Required
36	Multimeter	As Required
37	Number punch	As Required
38	Phase sequence meter	As Required
39	Pipe cutter	As Required
40	Pipe vice	As Required
41	Pipe wrench	As Required
42	Pliers set	As Required

43	Punching tool (Networking /Telephone)	As Required
44	Ratchet set	As Required
45	Safety boots	As Required
46	Scissor	As Required
47	Screw driver set	As Required
48	Soldering iron	As Required
49	Spanner set	As Required
50	Steel scale	As Required
51	Steel wire	As Required
52	synchronizing meter	As Required
53	Tachometer	As Required
54	Tester	As Required
55	Thimble press	As Required
56	Tong tester (clamp-on meter) AC/DC	As Required
57	Torch	As Required
58	Vernier calliper	As Required
59	Volt meter	As Required
60	Wire gauge	As Required
61	Wood saw	As Required

3. List of consumable items required		
S. No	Consumable Items	Quantity
	PV Panel mono crystalline	As Required
	PV Panel Poly Crestline	As Required
	PV Panel thin film	As Required
	Mounting Structure	As Required
	Mounting array	As Required
1	Cable 3 / .029"	As Required
2	Cable 7 / .029"	As Required
3	Cable 1 / .036"	As Required
4	Cable 23 / .0076"	As Required
5	Cable 40 / .0076"	As Required
6	Switch Single Way	As Required
7	Switch Two Way	As Required
8	Push Button	As Required
9	Bulb Holder Piano Type	As Required
10	Bulb Holder Button Type	As Required
11	Ceiling Rose	As Required
12	Fan Dimmer	As Required
13	Socket Two Pin	As Required
14	Socket Three Pin	As Required
15	Light Plug	As Required
16	Power Plug	As Required
17	PVC Pipe	As Required
18	PVC Elbow	As Required
19	PVC Band	As Required
20	Junction Box	As Required
21	Fan Box	As Required
22	Raval Plug	As Required
23	Pipe Shaddle	As Required
24	Cable Shaddle	As Required
25	Board 4 x 4	As Required
26	Board 7 x 4	As Required
27	Board 8 x 10	As Required
28	TV Pin	As Required
29	Telephone Pin	As Required
30	Insolation Tape	As Required
31	PVC Duct Plain 3/4"	As Required
32	PVC Duct Slotted 1"	As Required
33	PVC Duct Plain 3/4"	As Required
34	PVC Duct Slotted 1"	As Required
35	Fuse Piano Type	As Required

36	Main Switch	As Required
37	Breaker Single Poll	As Required
38	Breaker Double Poll	As Required
39	Volt meter Panel	As Required
40	Ampere Meter Panel	As Required
41	DB Box	As Required
42	DB Switch	As Required
43	PG Connector	As Required
44	Neutral Terminal	As Required
45	Screw Different Size	As Required
46	Steel Nail Different Size	As Required
47	Bulb 100 Watt	As Required
48	Bulb 200 Watt	As Required
49	Nut Bolt Different Size	As Required
50	Electric Bell	As Required
51	Two Pin Shoe	As Required
52	Three Pin Shoe	As Required
53	Cable Tube Connection	As Required
54	Tube Rod	As Required
55	Choke 20w, 40w	As Required
56	Tube Starter	As Required
57	Choke Patti Fitting	As Required
58	Winding Wire Different Size	As Required
59	Slat Paper Different Size	As Required
60	Cotton Tape	As Required
61	Sleeve Different Size	As Required
62	Varnish	As Required
63	Cable Three Core 40/ .0076	As Required
64	Cable Four Core 7/ .036	As Required
65	Cable Three Core 7/ .029	As Required
66	Connection Plate	As Required
67	Clutch Plate	As Required
68	Breaker Fitting Patti (Din Ray)	As Required
69	Relay 12V, 5A	As Required
70	Resistor Different Types	As Required
71	Transistor Different Types	As Required
72	LED	As Required
73	Diode	As Required
74	Rectifier Bridge	As Required
75	Carbon Brush	As Required
76	Battery 6v	As Required
77	Breaker Stripe	As Required
78	Flout Switch	As Required
79	Magnetic Connector	As Required
80	Cut Out	As Required
81	Breaker Cartridge Fuse	As Required
82	ON / OFF Push Button	As Required
83	Timer	As Required
84	Relay AC – 220V	As Required
85	Relay DC- 12V	As Required
86	Selector Switch Volt Meter	As Required
87	Selector Switch Ampere Meter	As Required
88	Emergency Switch	As Required
89	Soldering Wire	As Required
90	Paste	As Required
91	Light Indicator	As Required
92	Limit Switch (MEM Inter Locking)	As Required
93	Motor Driven Selector Switch (Water Tank)	As Required
94	Speaker	As Required
95	Acid	As Required
96	Hydro Metter	As Required
97	Multi Metter (Analogue / Digital)	As Required

98	Cam Starter (single phase & three phase)	As Required
99	Generator Switch	As Required
100	Star Delta Manual	As Required
101	Capacitor Different Size	As Required
102	Intercom Bell	As Required
103	Over Load Relay	As Required
104	Forward Reverse Switch	As Required
105	Tai Different Size	As Required
106	Magnetic Connector	As Required
107	Current Transformer	As Required
108	8 Pin type & 11 Pin type relay with base	As Required
109	Timer Circuit	As Required
110	Relay Circuit	As Required
111	Transformer	As Required
112	Core Transformer	As Required
113	Coal	As Required
114	Calcium Carbonate	As Required
115	Petrol	As Required
116	Heat Sleeve Tube	As Required
117	Changer Over Switch	As Required
118	Timer 0-60 second	As Required
119	Time 1-6 minute	As Required
120	Babon 1 ¼", 1 ½", 2", 2x3"	As Required
121	UPS Card	As Required