

Inspection Guide for PV Systems—Field Guide



Make sure all PV system ac/dc disconnects and circuit breakers are in the open position and verify the following.

**SHOULD BE “OFF”
TO START THE
INSPECTION**



1. All work done in a neat and workmanlike manner (NEC 110.12)



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**NO CONDUCTORS
HANGING DOWN
ATTRACTING
ATTENTION OR
DEBRIS**



1. All work done in a neat and workmanlike manner (NEC 110.12)



UGLY



GOOD



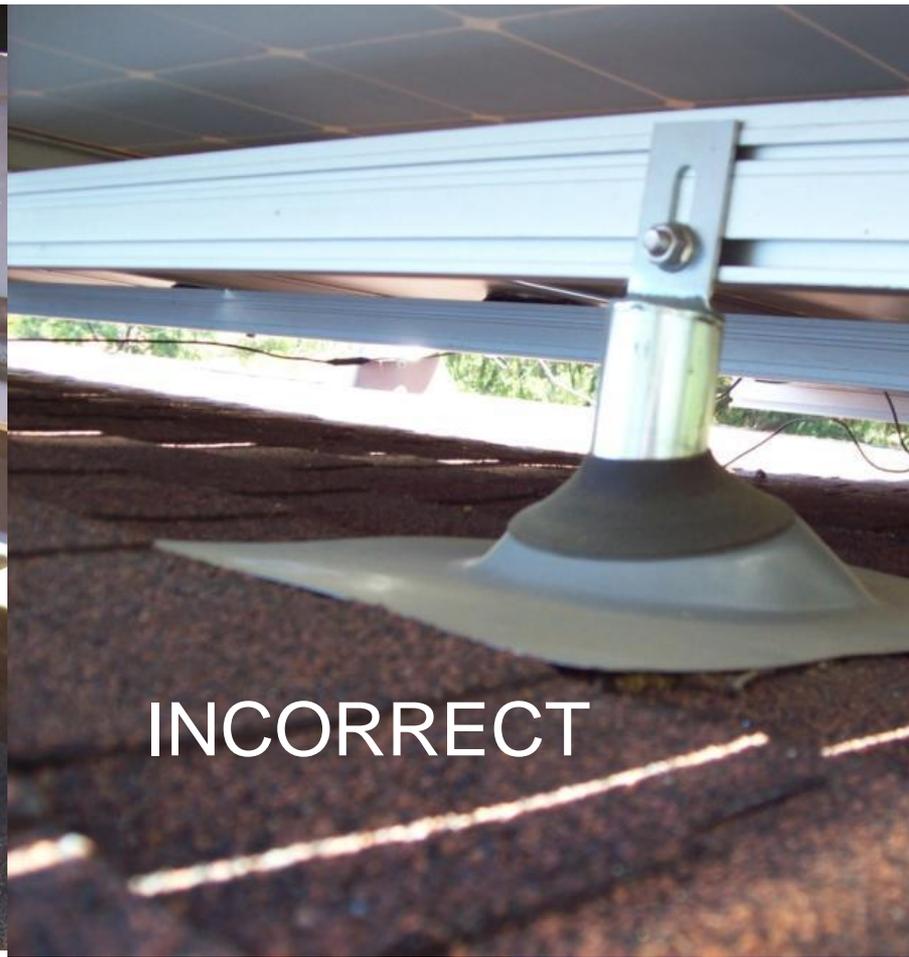
BAD

2. PV module model number, quantity and location (also neat and workmanlike)



2. PV module model number, quantity and location (bad structurally and aesthetically)





3. Array mounting system and structural connections according to the approved plan.

4. Roof penetrations flashed/sealed according to the approved plan.

5. Array exposed cables are properly secured supported and routed to prevent physical damage.



**POORLY ROUTED
UNSECURED AND LAYING ON
ROOF SURFACE AND VENT**

5. Array exposed cables are properly secured, supported and routed to prevent physical damage.



WELL SECURED AND SUPPORTED

6. Conduit correctly installed and according to CRC R331.3 and NEC 690.4(F).



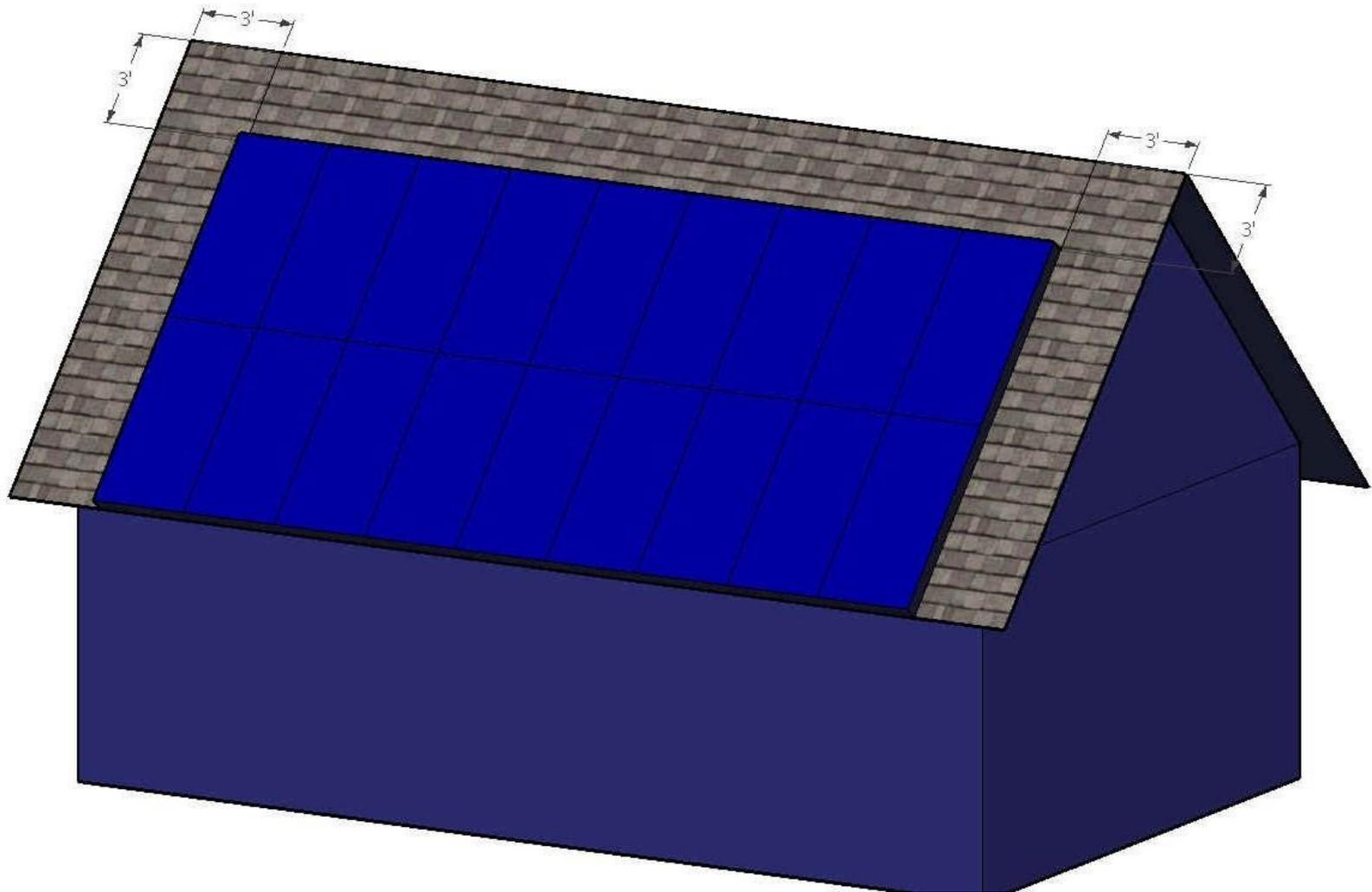
**RUN ALONG RIDGE
CONSISTENT WITH
690.4(F)**



**UNSECURED FLEX
LAYING ON ROOF**



7. Firefighter access according to approved plan.



7. Firefighter access according to approved plan.



**FIRE FIGHTERS HAD PLENTY OF ROOM TO
FIGHT THE FIRE AT THIS RESIDENCE**

8. Roof-mounted PV systems have the required fire classification

CERTIFICATE OF COMPLIANCE

Certificate Number 20150102 - E346702
 Report Reference E346702 - 20140208
 Issue Date 2015-JANUARY-02

Issued to: ZEP SOLAR INC |
 161 Mitchell Blvd Ste 104
 San Rafael, CA 94903-2085 USA |

This is to certify that representative samples of Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels |
 Zep System (Steep Slope) with Type 1 modules |

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 2703, "Outline of Investigation for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels."

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

The Zep System (Steep Slope) achieved a system fire classification of Class C when tested in combination with UL 2703

PHOTOVOLTAIC MODULE		CE
MODEL	KC120-1	
SER NO.	01632A1055	
DATE	2001.6	

IRRADIANCE AND CELL TEMPERATURE	1000Wm ⁻² AM 1.5 25 °C	800Wm ⁻² AM 1.5 47 °C	MAX. SYS. VOLT. 600 V
	Pmax	120 W	
Vpmax	16.9 V	15.2 V	SERIES FUSE 11 A
Ipmax	7.10 A	5.74 A	
Voc	21.5 V	---	MASS 11.9 kg
Isc	7.45 A	---	

UL US LISTED 9PB2	FIELD WIRING STRANDED COPPER ONLY 10 - 14 AWG INSULATED FOR 90°C	FIRE RATING CLASS C
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Only those products bearing the UL Certification and Follow-Up Service.

Look for the UL Certification Mark on the

B. Mahrenholz
 Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Service
 UL LLC
 Any information and documentation involving UL Mark services are provided contact a local UL Customer Service Representative at www.ul.com/contact



Certificate of Compliance

Certificate: 2593411 Master Contract: 257442
 Project: 70016432 Date Issued: December 3, 2014
 Issued to: SolarWorld AG

24 Martin Luther King Strasse
 Bonn, North Rhine Westfalia 53175
 Germany

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Tatjana Galonja-Stojsavljevic

Issued by: Tatjana Galonja-Stojsavljevic

PRODUCTS

CLASS 5311 10 - POWER SUPPLIES - Photovoltaic Modules and Panels
 CLASS 5311 90 - POWER SUPPLIES - Photovoltaic Modules and Panels - Certified to US Standards

PART A:

Photovoltaic Modules with maximum system voltage of 600 V dc or 1000 V dc and with Fire Performance of Type 1, Model Series:

Sunmodule Plus SW, followed by 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295 or 300 followed by "mono", may be followed by "black".

Sunmodule Plus SW, followed by 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275 or 280 followed by "poly", may be followed by "black".

XL modules - "Sunmodule SW", followed by 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355 or 360 followed by "XL mono", may be followed by "black"



Notice slight gap caused by properly installed clip

Wrong grounding hardware

Hardware consistent with instructions

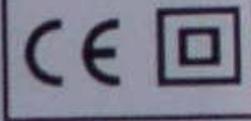


9. Grounding/bonding of rack and modules according to the manufacturer's installation instructions

- 10. Equipment listed and installed according to the approved plan
- 11. Inverter is marked “utility interactive.”



PHOTOVOLTAIC MODULE	
MODEL	KC120-1
SER NO.	01632A1055
DATE	2001.6



IRRADIANCE AND CELL TEMPERATURE	1000Wm ⁻² AM 1.5 25 °C	800Wm ⁻² AM 1.5 47 °C	MAX. SYS VOLT.
			600 V
Pmax	120 W	87 W	SERIES FUSE

Vpmax	16.
Ipmax	7.1
Voc	21.
Isc	7.4



Tightening torques: fuse holders 15 in.-lbs.,
neg. lugs 35 in.-lbs., output lugs 375 in.-lbs.



Utility Interactive Photovoltaic Inverter

Rated output power: 3200 Watts	DC max voltage: 500 VDC
AC nominal voltage: 240 VAC	DC operating limits: 230-430 VDC
AC operating limits: 211-264 VAC	DC maximum current: 15 Amps
AC maximum current: 14 Amps	Operating temp range -25 to 40C
AC trip current: 20 Amps	Enclosure - Type 3R outdoor use
AC operating Frequency: 60Hz	Built and tested to UL1741
AC frequency range 59.3-60.5 Hz	
S/N: SP32240121005343	



12. Conductors, cables and conduit types, sizes and markings according to the approved plan

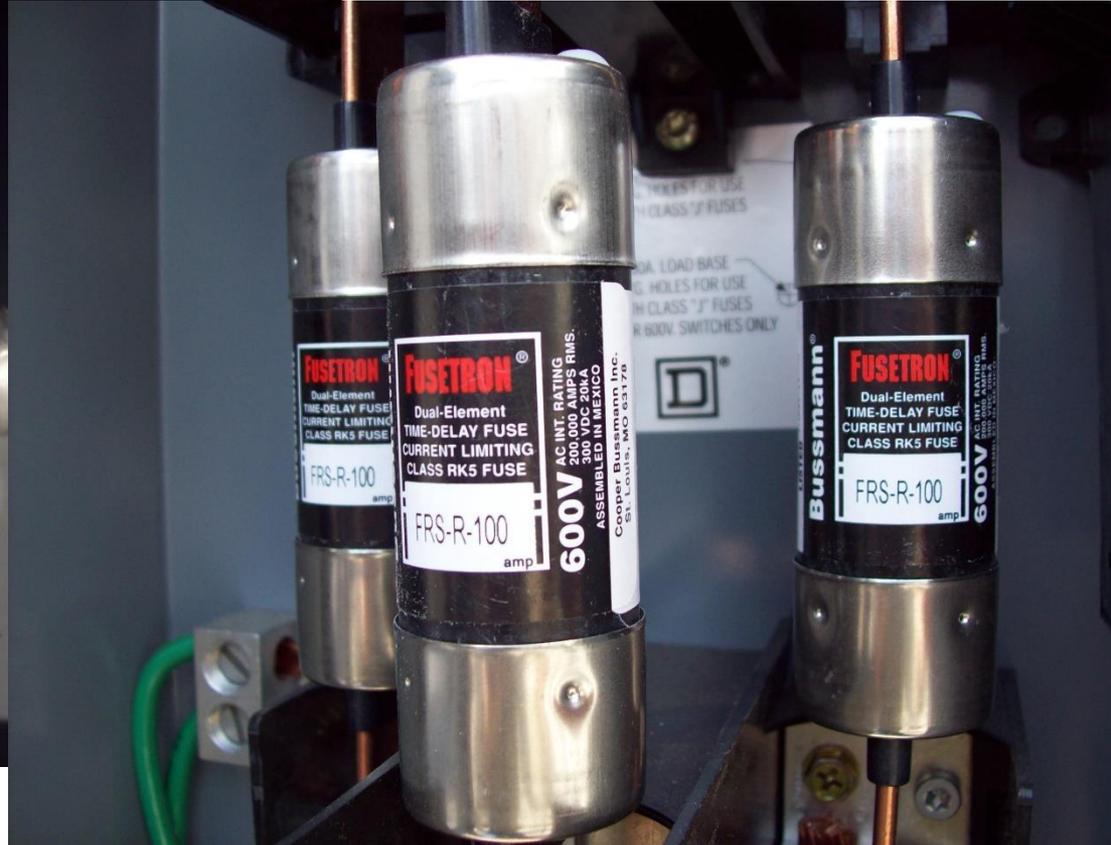
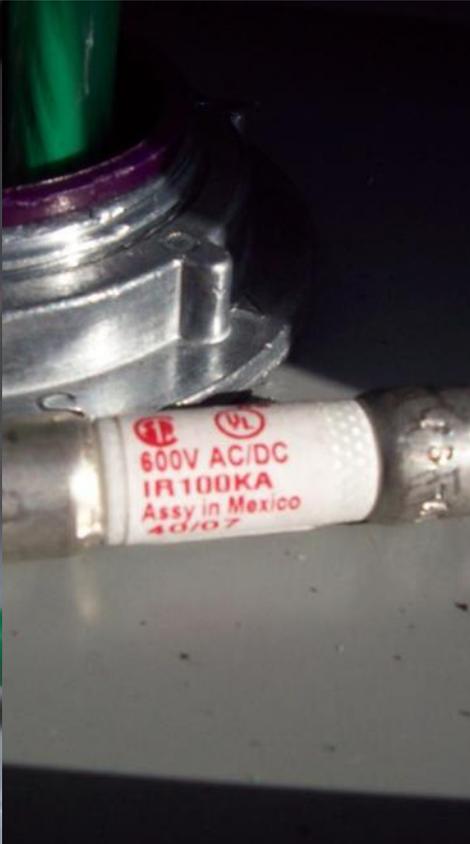


THWN WIRE USED
OUTSIDE CONDUIT
IN SUNLIGHT-NOT
ALLOWED

PV WIRE HAS
CORRECT OUTDOOR
RATINGS

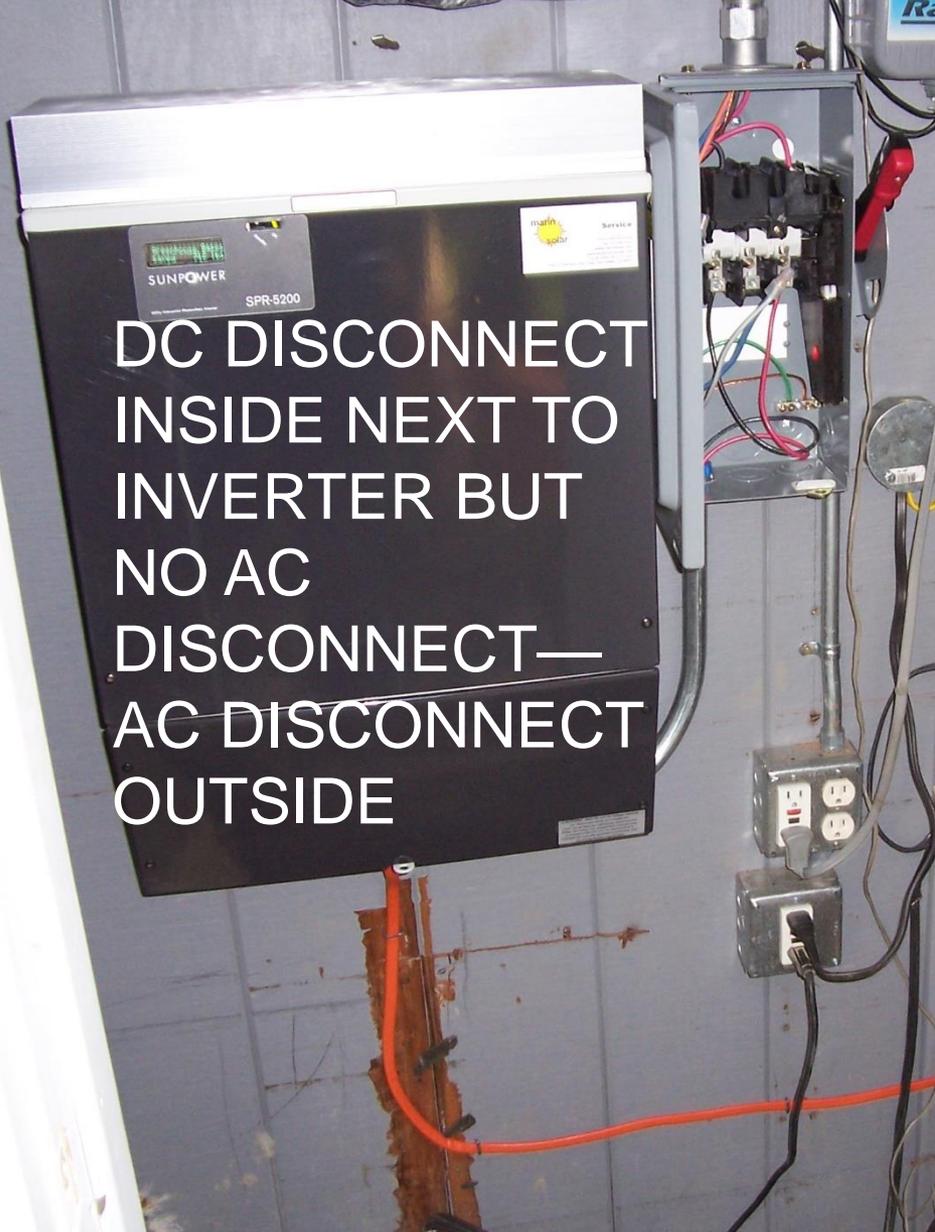


13. Overcurrent devices are the type and size according to the approved plan



14. Disconnects according to the approved plan and properly located as required by the NEC





14. Disconnects according to the approved plan and properly located as required

15. Inverter output circuit breaker is located at opposite end of bus from utility supply



16. PV system markings, labels and signs according to the approved plan



**INTERACTIVE SYSTEM
POINT OF INTERCONNECTION**

**OPERATING AC CURRENT
54.1A**

**OPERATING VOLTAGE
480V**



DC Photovoltaic Power Source

Operating current	19.6 A
Operating voltage	357.0 V
Maximum system voltage	519.5 V
Short-circuit current (max)	26.5 A

**WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION**

**HEAVY DUTY SAFETY SWITCH
INTERRUPTOR DE SEGURIDAD DE SERVICIO PESADO
30 A
600 Vac / V- 600 Vdc 177**

SQUARE D

**⚠ DANGER / PELIGRO
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH
PELIGRO DE DESCARGA ELECTRICA, EXPLOSION O DESTELLO POR ARQUEO**

- **Always use appropriate personal protective equipment (PPE) and follow safe electrical work practices. (See NFPA 70E.)**
- **This equipment must only be installed and serviced by qualified electrical personnel.**
- **Never operate energized parts with door open. Keep door latched.**
- **Turn off switch before removing or installing fuses or making field side connections.**
- **Always use a properly rated voltage sensing device at all line and load bus dips to confirm switch is off.**
- **Turn off power supplying switch before doing any other work on or inside switch.**
- **Do not just reinsert one fuse in fused switch.**
- **Failure to follow these instructions will result in death or serious injury.**
- **Para evitar lesiones personales, siempre use equipo de protección personal (EPP) apropiado y siga las prácticas de seguridad eléctrica establecidas por el Código Nacional de Normas NFPA 70E.**
- **Este equipo solo debe ser instalado y mantenido por personal eléctrico capacitado. Debe instalarse y repararse solo por personal capacitado y con el interruptor cerrado y la puerta abierta cuando se estén realizando las pruebas de seguridad.**
- **Nunca opere energizado con la puerta abierta cuando se estén realizando las pruebas de seguridad.**
- **Desenergice el interruptor antes de retirar o instalar fusibles o de hacer conexiones en el lado de carga.**
- **Siempre utilice un dispositivo de detección de tensión apropiado en los dips para confirmar de los buses de carga y línea para confirmar la desenergización del interruptor.**
- **Desenergice el interruptor antes de realizar cualquier otro trabajo en el interruptor.**
- **No inserte fusibles de otro interruptor en el interruptor de este.**
- **El incumplimiento de estas precauciones puede causar la muerte o lesiones serias.**
- **Para evitar lesiones personales, siempre use equipo de protección personal (EPP) apropiado y siga las prácticas de seguridad eléctrica establecidas por el Código Nacional de Normas NFPA 70E.**

**Solar Electric Power System
Array DC Disconnect**

**WARNING!
ELECTRIC SHOCK HAZARD - DO NOT TOUCH
TERMINALS. TERMINALS ON BOTH LINE AND LOAD
SIDES MAY BE ENERGIZED IN THE OPEN POSITION.**

16. PV system markings, labels and signs according to the approved plan



OWNER HAD ALL THE EQUIPMENT STUCCOED— INCLUDING ALL THE SIGNS

17. Connection of the PV system to the grounding electrode system according to the approved plan.



18. Access and working space for operation and maintenance of PV equipment



**ANYONE HAVE
A MACHETE
HANDY?**

19. The rapid shutdown system is installed according to the approved plan [690.12]

