

Maintenance Recommendations (AS/NZS 5033:2012)

C1 – SAFETY

Attention should be given in the maintenance procedures to the following safety requirements:

- Emergency shutdown procedure
- Obey all warning signs
- Shut system down and interrupt PV array currents according to the manual shutdown procedure as per AS 4777 (series) or AS/NZS 4509.1
- Split strings into extra low voltage sections (if relevant)
- Warn of any live parts that cannot be de-energised during daylight

C2 PERIODIC MAINTENANCE

The following maintenance activities should be considered for inclusions in the maintenance procedures, according to the location, size and design of the PV array:

- Safety warnings and manufacturer's recommendations
- Cleaning of the PV array might be periodically required in locations where it is likely to collect dust or other shading materials
- Periodic inspections should be carried out to check wiring integrity, electrical connections, corrosion and mechanical protection of wiring
- Verify open circuit voltage and short circuit current values
- Verify functioning of earth fault protection (if relevant)
- Verify operation of tracking systems (if relevant)
- Measure I-V characteristics (if possible)
- Perform seasonal PV array tilt adjustment (if relevant)
- Check PV array mounting structure (s)
- Test operation of switches regularly
- Check for module defects (fracture, moisture penetration, browning etc)
- Verify status of surge arrestors (if relevant)
- Infrared scans can be of use in identifying problems

Example Maintenance Schedule

Sub-system or component	Maintenance action	Frequency	Remarks
Site	Verify – cleanliness (accumulation of debris around and/or under array). No shading of array	Quarterly	Clean site as required Trim trees if required
PV Modules	Verify cleanliness (accumulation of dust or fungus on array) Check for visual defect including – fractures; browning; moisture penetration and frame corrosion	Quarterly 1 year	Clean if necessary Modules with visual defects should be further inspected for performance and safety to determine the need for replacement
	Inspect junction boxes for – tightness of connections; water accumulation/build up; integrity of lid seals; integrity of cable entrance, glands and/or conduit sealing; and integrity of clamping devices. Verify bypass diodes	1 year	Any Defective seals, clamps and by pass diodes should be replaced
Wiring installation	Verify mechanical integrity of conduits	5 year	Any damaged conduit should be replaced
	Verify insulation integrity of cables installed without conduit	5 year	Any damaged cable should be replaced
	Check junction boxes for – tightness of connections; water accumulation/build up; integrity of lid seals; integrity of cable entrance and/or conduit sealing and integrity of clamping devices. Verify blocking diodes and surge arresters for degradation	1 year	Any defective seals, clamps blocking diodes and surge arresters should be replaced
	Check connections for tightness of connections and corrosion	1 year	
Electrical characteristics	-Measure open circuit voltages -Measure short circuit currents	1 year	
		1 year	
Protective devices	-verify integrity of fuses -verify operation of CBs and RCDs -verify operation of earth fault protection system -verify operation of solar array isolation device	1 year	
		1 year	
		1 year	
		1 year	
Mounting structures	-verify tightness and integrity of bolts and other fastening devices -inspect for corrosion	1 year	
		5 year	

This list of items is not exhaustive but provides examples only and values for frequency are examples. Frequency will be site dependent.

C3 OPERATION AND MAINTENANCE PROCEDURES

Operation and maintenance procedures should include the following:

- A short description of the function and operation of all installed equipment. More detailed information should be available from the manufacturer’s documentation
- Emergency and maintenance shutdown procedures
- Periodic maintenance requirements including procedures and schedule
- Equipment manufacturer’s documentation (data sheets, handbooks etc) for all equipment supplied