Daystar Solar Operation and Maintenance Guidelines

1. For the optimal operation of a PV plant, maintenance must be carried out on a regular basis.
2. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place.

Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

SOLAR PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

i. The panels are cleaned at least once every fifteen days.
ii. Any bird droppings or spots should be cleaned immediately.
iii. Use water and a soft sponge or cloth for cleaning.
iv. Do not use detergent or any abrasive material for panel cleaning.
v. Iso-propyl alcohol may be used to remove oil or grease stains.
vi. Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
vii. Wipe water from module as soon as possible.
viii. Use proper safety belts while cleaning modules at inclined roofs etc.
ix. The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
x. Check if there are any shade problems due to vegetation or new building. If there are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
xi. Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.
xii. Never use panels for any unintended use, e. g. drying clothes, chips etc.
xiii. Ensure that monkeys or other animals do not damage the panels.

INVERTER

i. The inverter should be installed in a clean, dry, and ventilated area which is separated from, and not directly above, the battery bank (if applicable).
ii. Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
iii. Check that vermin have not infested the inverter. Typical signs of this include
iv. Spider webs on ventilation grills or wasps' nests in heat sinks.
v. Check functionality, e.g. automatic disconnection upon loss of grid power supply, at least once a month.
vi. Verify the state of cable connections, and circuit breakers.

SHUTTING DOWN THE SYSTEM

i. Disconnect system from all power sources in accordance with instructions for all other components used in the system.
ii. Don't disconnect the DC connector (MC4) when the system is "ON".
iii. Don't switch off the DC isolator before switching "OFF" the AC supply while system is running.
iv. Avoid frequent switching "ON" and "OFF" of the system.
v. Don't change the settings in the Inverter without consulting the service engineers.
vi. To the extent possible, system shutdown will not be done during daytime or peak generation.

INSPECTION AND MAINTENANCE SCHEDULE:

Component	Activity	Description	Interval	By
PV Modules	Cleaning	Clean any bird droppings/ dark spots on module	Immediately	Beneficiary
	Cleaning	Clean PV modules with plain water or mild dishwashing detergent. Do not use brushes, any types of solvents, abrasives, or harsh detergents.	Fortnightly or as per the site conditions	Beneficiary
PV Array	Inspection	Check the PV modules and rack for any damage. Note down location and serial number of damaged modules.	Annual	User/ Technician
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the, array and move them if possible	Annual	User/ Technician
	Vermin Removal	Remove bird nests or Vermin from array and rack area.	Annual	User/ Technician

INSPECTION AND MAINTENANCE SCHEDULE:

Component	Activity	Description	Interval	By
Junction Boxes	Inspection	Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. Check position of switches and breakers. Check operation of all protection devices.	Annual	User/ Technician
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual	User/ Technician
Inverter	Inspection	Observe	Quarterly	User/ Technician
Plant	Monitoring	Daily Operation and Performance Monitoring	Daily	Beneficiary
Logbook	Documentation	Document all O&M activities in a workbook available to all service personnel	Continuous	Site in charge

Operation and Maintenance Guidelines of Grid Connected PV Plants

i. Periodic cleaning of solar modules, preferably once every fortnight or as per site conditions. As this task has to be done by the beneficiary, the vendors shall apprise the beneficiary on the importance and proper technique for cleaning.
ii. O&M of Solar Power Plant shall be compliant with grid requirements to achieve committed energy generation.
iii. Periodic checks of the Modules and BoS shall be carried out as a part of routine preventive and breakdown maintenance.
iv. Immediate replacement of defective Modules, Invertors/PCUs and other equipment as and when required.
v. contact service engineers for any service-related issue.