Introduction on technical guidelines for utilities integrating PV into their grids

Palau Workshop
8th-12th April

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PPA Pacific Power Association

SPC Secretariat of the Pacific Community

NORTHREP
North Pacific ACP Renewable Energy and Energy Efficiency Project

IRENA
International Renewable Energy Agency

PPUC Palau Public Utilities Corporation

PALAU PUBLIC UTILITIES CORPORATION

Outer island maintenance visits

Maintenance and Fault finding

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Republic of Palau

PALAU PUBLIC UTILITIES CORPORATION

Overview

- Maintenance visits to outer islands
  - Status
  - Maintenance
  - Performance
  - Awareness & Training
  - Reporting
- Installation records

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Upon Arrival

- You arrive on site
- You stayed dry
- And so did your tools
- AND you brought
  - distilled water!

- What is the first thing you do?

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- Check the electrolyte level!

The battery is the most sensitive component in the system

- Check the battery voltage in acceptable range: 42V to 60V => for a 48V system
- System active or OFF?
- Any problems?

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- Visual inspection – physical:

– Shading!!

– Dirt

– Damage

– Corrosion of structure

- Visual inspection – electrical:

– Burnt terminal (panel center)

– DC Center (sometimes)

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2. Performance

This depends on whether there is sunlight

- Check each module string:
  Amps must be the same (unless shading)
- Load test: Observe battery voltage,
  any funny sounds in inverter
- Battery check

(either selected cells or whole battery set):

– SG reading
– Volts of cell, in particular under load

3. Maintenance: Basics

- Top up batteries
- Clean: Battery tops, array
- Close all enclosures tightly
- Clean panels

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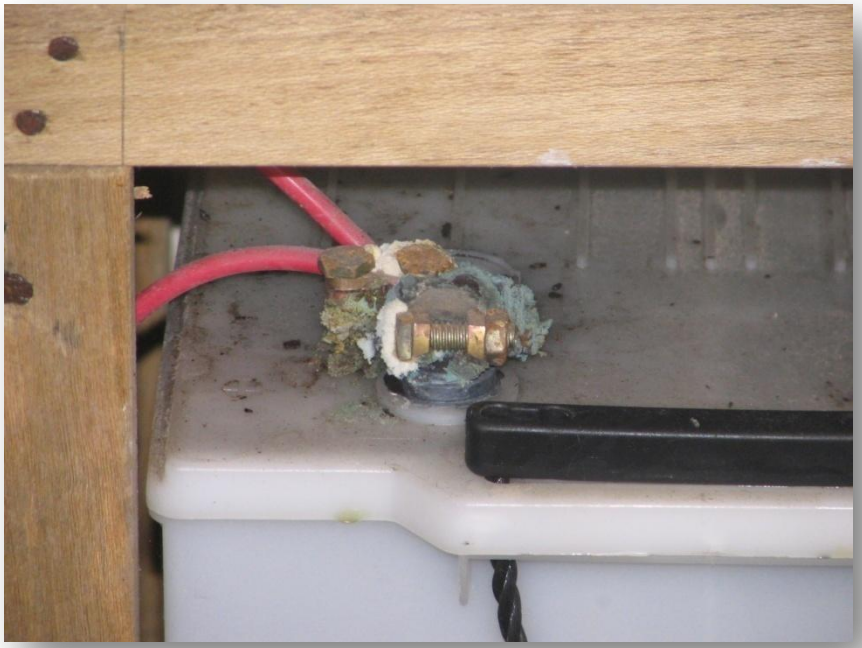
When things look like this:



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Maintenance in depth

- Shut down system
- Disconnect PV array
- Disconnect Battery DC connection at battery
- Check connections:

– In junction box
– In Panel Center
– In DC Center
– At battery fuse
– At battery cell

- Cut off and redo if corroded!

Awareness & Training

- Talk to community/users
- Talk to local operator – remind him of how the system works
- What kind of loads are ok,
- which loads are not ok
- Like a reminder each time
- How much can be operated?
- Systems are generously sized - it should be used.
- Is there enough distilled water?

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End-user training

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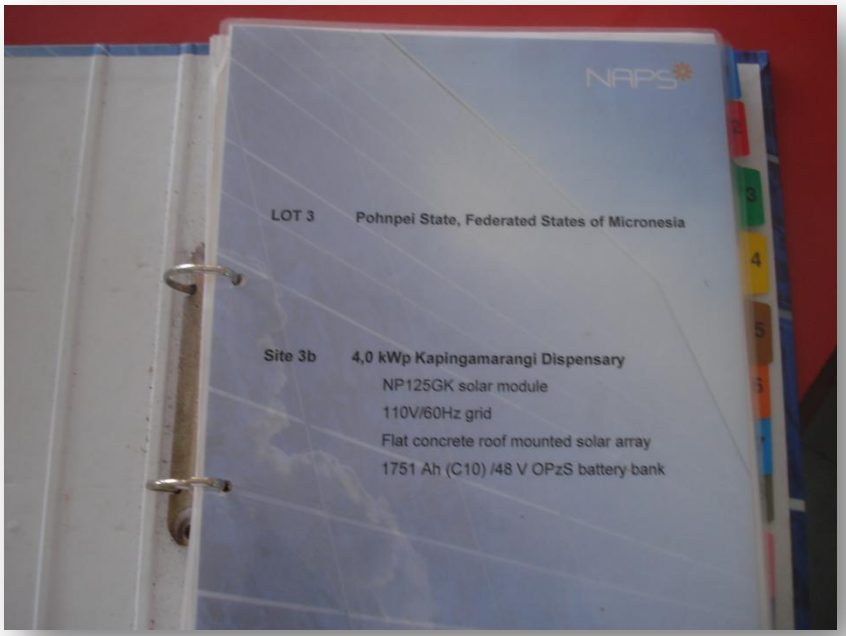
AND…

- Important read AND use the manual …… always



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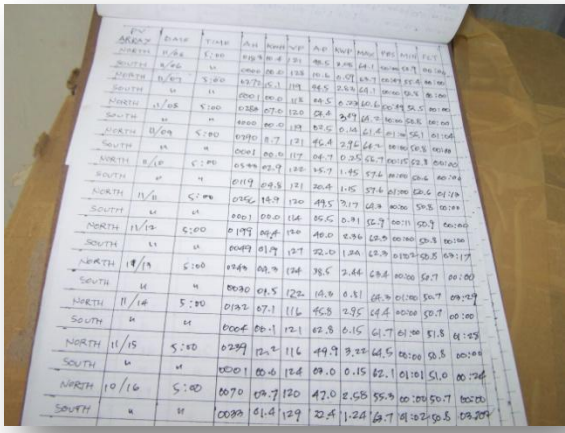
Reporting

- This is an ongoing activity!
- This is critical – continuity is essential
- Report your findings
- Make notes for next maintenance trip
- The report should have the format:

– System status

– Performance

– Maintenance tasks performed



- Keep the reports on site.
- Take a notebook to note down issues for the next site visit.

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Then …

- Enjoy the friendliness of the community

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EU SOLAR TEAM


TEAM


02/19/2009

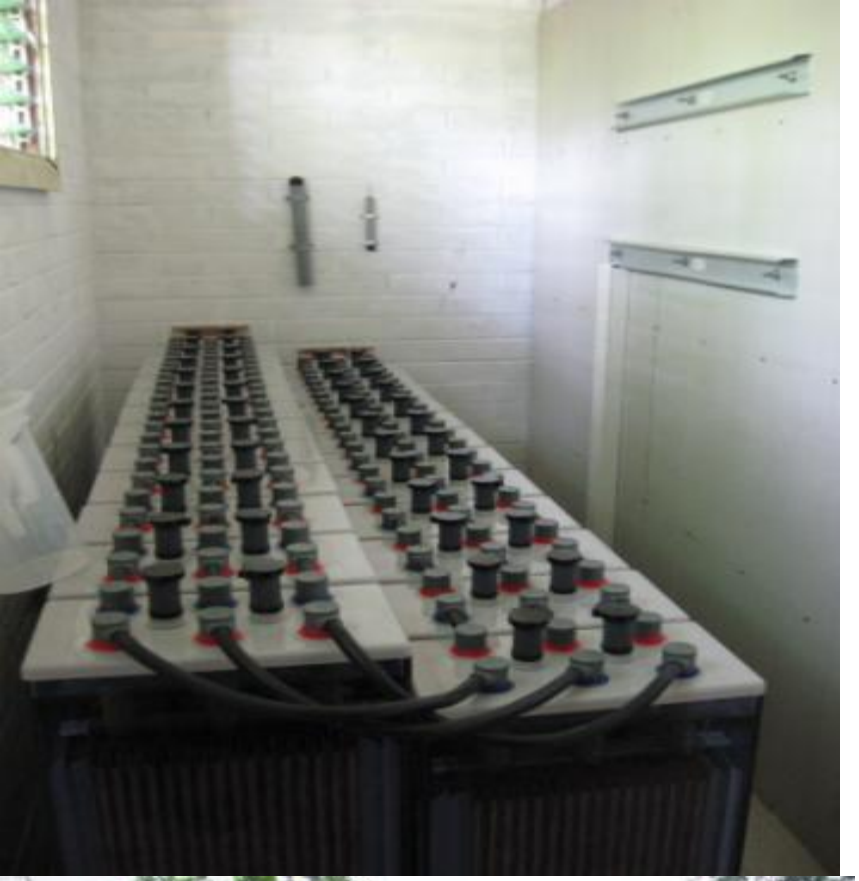
Lessons learned – Products

- Products often not suitable for harsh outer island conditions
- Wrongly chosen equipment for island environment
- Improper match of system components by end-users

➢ Need for standardization of systems

➢ Need for awareness in local vernaculars

Renewable E
Micro



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Misconception:
“LOW Maintenance is NO Maintenance”

A slide show presentation after a successful installation of a 8 kWp Solar System on a Outer Island School

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REMEMBER

Monitor, Manage, Maintain (the 3Ms)

Monitor: - the solar system
- weather condition
- power usage

Manage: - daily energy consumption
- usage of devices
- users behavior (switch off unused devices)

Maintain: - clean the panels
- clean the batteries & power centre
- fill batteries with distilled water

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“The product of professionalism is pride in your work, that leads to a quality installation”

A bright future for a new generation