Flooded Lead Acid Battery Maintenance Manual

Once Every Month:

- **Equalization Charge**: Start equalization between 12:00-1:00 PM. Allow three hours for equalization to complete.
  - To run Equalization Charge please follow the following steps.
    1. Set the C-40 Hydro Charge Controller in Manual Equalizing Mode. To do this press the button on the right side and hold until the LED indicator begins to alternate between red and green. (Reference: C-Series Multifunction DC Controller Owner’s Manual, Page# 31)
    2. Using the white XW Control Panel go to the Battery Menu screen, press Enter. Then Select Activate on the Equalize screen. This should start the Equalization Process. (XW Series Solar Charge Controller Owner’s Manual, Page# 4-13 to 4-14)
    3. Log date of equalization charge into logbook.
  - To stop the Equalization Charge please follow the following steps.
    1. When the Solar Charge Controllers turn off for the Equalization Process press the Reset button on the C-40 Hydro Charge Controller until the LED indicator stops flashing. (Reference: C-Series Multifunction DC Controller Owner’s Manual, Page# 33)

- **Terminals**: Cleaning the Battery Terminals
  - If there is visual build up on the battery strings follow the following the steps.
    1. Use a wire brush to clean the contacts but do not disconnect anything. If you need to disconnect make sure the DC Disconnect is switched OFF.
    2. When finished cleaning switch the DC Disconnect back ON.
  - If there is visual build up on the Inverter Battery terminals please follow the following steps.
    1. CLOSE the hydro valves at the hydro shed. Completely turn off the Hydro Generator.
    2. Switch OFF all of the breakers in the DC Panel.
    3. Disconnect Terminal leads and clean with wire brush.
    4. Reconnect Leads and Switch on all Breakers in DC Panel.
    5. OPEN Hydro valves.

- **Checking Battery Fluids**(After Watering)
  - Checking the Specific weight of the batteries.
    1. Remove vent caps and place measuring device in liquid.
    2. Do NOT breathe in any fumes and keep skin and eyes away from liquid. If any exposed to any liquid rinse with water.
3. Replace vent caps.
4. Repeat process for two batteries out of each of the four strings once before and after equalization charge. Place the data in a log book for future reference.

- Watering Batteries (After Equalization)
  - How to add water to the battery strings.
    1. Remove the vent cap on the battery and check water level.
    2. If the water is below the plates inside the battery add distilled or de-ionized water to a level 3mm below the vent well.
    3. Replace vent cap.

Solar Array Maintenance Manual

Once Every Month:

- Clean solar panels.
  - To clean the solar panels of dust or grime please follow the following steps.
    1. Use a soft towel, warm water, and some dish soap. Clean all dirt and bird droppings. After thoroughly cleaning the panel, rinse so that there is no soap residue is left.
    2. Exercise extreme caution when using ladder so that you don’t scratch the panels them selves or fall causing injury.
  - To clean panels of snow please follow the following steps.
    1. When removing snow from panel arrays don’t use metal objects or objects that will scratch the panels. Would recommend using some type of squeegee with a long handle. It’s easiest to remove snow loads right after it has snowed so that it doesn’t freeze onto the panel.
    2. Exercise extreme caution when using ladder so that you don’t scratch the panels them selves or fall causing injury.

- Inspect solar array for damage from rodents, animals, and Mother Nature.
  - Damage can range from chewed up wires to broken glass in the solar panels. To replace a solar panel please follow the following steps.
    1. Turn off breakers at solar array. Either put a blanket or trap over the solar array. The blanket it to reduce or eliminate the sunlight hitting the panel and creating voltage and current which could cause shock or death if the correct contacts are made.
    2. Unplug the positive and negative wires that are approximately 4 feet long and one end is attached to the panel. Note the wires themselves don’t detach from the panel. To unplug the safety plugs, depress on the sides of the plug and the plugs should come apart.
3. Now you can remove the problem panel and replace it with a new one of the same make and model or one that has the same power characteristics.

Once Every Year:

- Check the tilt angle of the solar arrays.
  - The proper angle of tilt for the array is 60 degrees and this angle should remain the same throughout the year unless winter usage at Taylor increases, then an angle of 30 degrees will be more appropriate for winter months.

Hydro Unit Maintenance Manual

Once Every Month:

- Check and clean sediment trap under hydrogeneration unit.
  - To clean out sediment trap please follow the following steps.
    1. Turn head valve off, the valve that cuts water supply to the turbine off. Turn the three nozzle valves off that supply the turbine itself. Now flip breaker that will isolate the hydrogeneration unit. Now unbolt the 4 bolts that hold the hydro unit to the top of the sediment catch basin.
    2. Using a garden hose wash out the contents of the sediment trap so that sediment flows out drain pipe. If a lot of sediment is present, use a small shovel and bucket to remove sediment.
    3. Note: If cleaning sediment trap in winter, allow the bypass valve for the hydro unit to run at least at a trickle, so that it doesn't freeze while you’re cleaning the sediment trap. Never completely shut off water flow through the water pipe for the hydro unit, this will result in damage to pipe.
    4. Note: Never turn off hydro unit by simply switching a breaker, this will cause turbine to speed up and destroy itself. ALWAYS TURN OFF WATER FLOW BEFORE TURNING OFF POWER COMING OUT OF HYDRO UNIT.