O&M Basic Requirements

1. **EH&S (Environmental Health & Safety)** – Team members need to be acquainted with recognizing environmental problems and potential problems. Many solar plants were built without a long term view of erosion, improper drainage among various other weather related factors that have resulted in ponding water in and around equipment, unacceptable ruts and ditches that create hazards for team members walking and driving around the site, etc. Solar plants often offer an inviting habitat for wildlife to nest and hunt in. Many MSA stipulate that these factors be reported in quarterly, Bi-annual or Annual plant inspections. Risks that these factors present can be avoided by O&M personnel being familiar with recognizing and communicating hazardous conditions, a proper understanding of work that is to be done, briefings on procedures that need to be followed and documented, regular maintenance that is performed. It is also crucial that a Health and Safety Policy and Safety Training Matrix be on file and weekly company wide meetings be established to ensure that staff are aware of and knowledgeable in the company’s policies pertaining to the safety and welfare of its employees. There should be written procedures in a Master File for every service that is performed by the O&M team (including office personnel). Among these procedures would be Emergency Evacuation Procedures, Fire Mitigation Plans, Equipment Service and Repair Procedures, Best Work Practices for examples. The EH&S Policy is managed by a Safety Coordinator/Manager who ensures all training documentation, procedures, incident reporting and all other related documentation be kept and maintained.
2. **Personnel and Training –** Team members should be trained and have the relevant qualifications to perform the work in a safe, accountable manner that is in accordance with the company’s HASP (Health And Safety Program).
3. **Asset Management –** We should consider (1) if we will be offering this service and (2) Who will perform the duties. This position is responsible for mainly providing reports to the Asset Owner. The O&M Contractor can provide some data, such as reporting on KPI’s (Key Performance Indicators) but other reporting, such as raw data on energy produced, Performance Ratio and Availability of equipment, Contractor Response Time, etc. These may be required per contract. If the Asset Management team is a separate entity than the O&M Contractor, it would require us to work very closely with the Asset Management team to ensure proper reporting is given. This key position is often responsible for ensuring that the operation of the plant is in accordance with national and local regulations and contracts.
4. **Power Plant Operation –** This is the remote monitoring, data acquisition service operation, and control of the plant. It involves good planning and coordination with the corrective and preventive maintenance teams for the timely shut down of equipment, repairs, outage response, adherence to PPA stipulations, documentation of all personnel that enter and exit the plant. This documentation control and management is crucial to operating and maintaining a plant successfully. Site security, emergency response, outage alerts, trending data and other data acquisition derived data will be documented and communicated by this person or group to constantly improve upon plan performance and good stewardship of the plant assets.
5. **Maintenance –** Regular Physical, Visual, On-Site inspections will be performed by solar plant technicians that should be trained and certified in NFPA 70E, OSHA 10, CPR and CMMS (Corrective Maintenance Management System) documentation at a minimum. Safety protocol and reporting is and will continue to be a major factor in the success and growth of an O&M company. Any reputable organization will have a good safety record and will attract the best field service candidates. Technicians should be or actively pursuing a fluent knowledge of the manufacturer requirements for equipment preventive maintenance for the plants they maintain. Good record keeping and reporting of maintenance is a vital need. Manufacturer service, operation and maintenance manuals will need to be electronically stored in a program such as Sharepoint, BOX and many other records storage applications. A CMMS program ( as mentioned above) will be needed for tracking, documenting, reporting and planning maintenance work, outage service response, incidents, etc. This program will also record and timestamp travel time, on site time, job completion, response time intervals, etc. This is the main tool that the Asset Management team, Operations team and Maintenance team will coordinate and communicate with. It also serves as the means in which all reporting can be generated for the plant or portfolio and sent to the plant owner. Technicians should be well versed in the navigation of this program and be encouraged to be very descriptive in their reporting and documentation, such as pictures, inverter error codes, etc. Efficient use of the CMMS program will ensure that all parties can be aware of the status of an outage, service, planned maintenance, etc. of any plant action. An “On Call” plan will need to be established to ensure all required response times for outages (which vary by contract) be fulfilled. An hourly rate for technicians should be established for normal and afterhours rates, as customers will often request that the O&M Provider perform work that is outside of the normal scope of the contract and will need to quoted and approved before the work begins or charged at an hourly rate. The hourly rate will need to be established before bidding on contracts, as that rate will be in the contract as “Additional Services” or similar language.
6. **Vegetation –** We should discuss this coverage and if we will provide it or not. Mowers will need to have chain guards on the mowing decks to prevent debris such as sticks, pebbles and other projectiles from being slung at the modules and other equipment and damaging them. Some contracts require Buffer Maintenance, such as maintaining bushes, berms and trees that serve as the property buffer, watering bushes, mulching etc. Erosion control is often handled by the vegetation contractor, such as backfill, re-seeding and snow removal. Be sure to have vetted sub contractors that can perform this work if we don’t do it in house, as it will be needed. There will be a need for proper storage of mowing, trenching equipment, tractor and implements, fuel, etc. as many solar plants do not have storage availability and storing equipment and fuel on site for a lengthy period of time may be contrary to owner or O&M EH&S or HASP policies. Most contracts allow for a sub-contractor to be used in any aspect but often the owner may ask to see their HASP documentation. A good vetting process will ensure we have reliable and trustworthy sub-contractors that can assist if needed.
7. **Spare Parts Management –** Some contracts require that the O&M Provider have a means to store, inventory, document and replenish spare parts that are requested by the owner to be kept available. The CMMS software should have the ability to incorporate this and allow reports to be created for parts inventory, tracking and identification.