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TECHNICAL
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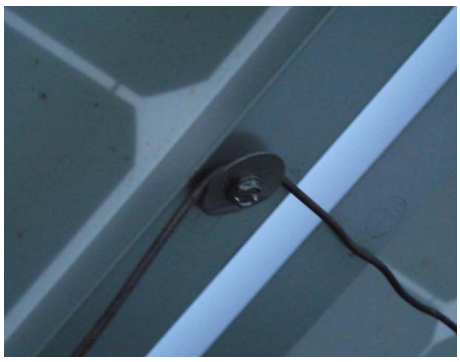
Commissioning Services, Lessons from the Field

During the construction of any project, there are always "field modifications" to the design plans. Frequently, these result in a better, more cost effective installation. On occasion, field modifications made for the sake of cutting costs, or as the result of inexperience, can present themselves as costly problems later on. Solar photovoltaic projects are no exception. Without a detailed final commissioning, problems can go unnoticed, affecting overall output and the reliability of the system.

During a detailed commissioning, current technologies, such as an amperage-voltage (I-V) curve tracer, are able to detect reduced output wattages for strings and individual modules. A visual inspection can sometimes determine the source. Weeds and dirt are a common cause. Module mismatch, and even cell mismatch, as well as diode failure, can be seen in a detailed curve analysis. A module's broken cells or poor solder joints are harder to diagnose. An infra-red (IR) or thermo-imaging scan can reveal these problems, whether the issue results from weeds (upper photo) or something internal.

Inexperienced electricians may try to cut corners with non-code compliant wiring methods. Grounding of the modules is important for lightning and fault protection. The use of tech screws and washers (lower photo) is not a good grounding method and can damage the module. Utilizing this method for grounding voids the manufacturer's warranty. The ground wire in this type of installation is extremely undersized and would melt in the event of a lightning strike. Moreover, the wire would not carry the strike to ground, exposing the modules to the full damaging effect of the strike. Undersized wiring, incorrect fuse and breaker sizes, equipment that is not DC rated or UL listed, and improperly installed (or non-existent) surge protectors are examples of issues that may not be apparent at first glance, but come to light during a thorough commissioning.



Periodic third-party inspections during construction can also help detect problems early, minimize the time it takes to connect to the utility, and avoid delays for corrections. Local electrical inspectors are only given authority over NEC Code issues, not plan compliance or manufacturer specifications. An outside party, under authority of the owner, can assure complete compliance.

As inspections are important to the construction of any new project, third-party field testing and commissioning is an essential element in the health and output of your PV system.

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