



Harvesting Instructions for PV Power Plant Connectors

BACKGROUND

To better understand the failure mechanisms and root causes for connector failure, Sandia National Laboratories has launched a campaign to collect failed and degraded connectors from PV power plants and commercial rooftops across the US. Connectors will be subjected to electrical and metallurgical forensics analysis to look for evidence of corrosion, contamination, defective and degraded materials, cross-mating incompatibility, etc. In return, Sandia will share diagnostic results with participating companies.

HOW TO HARVEST A PV CONNECTOR FOR FORENSICS ANALYSIS

1. Connector should be removed with sufficient cable length attached to enable electrical analysis. We recommend a cable length on both positive and negative sides of 10" in length.
2. An identification number (1,2, etc.) should be taped directly to the cable, with details provided on the accompanying data sheet.
 - Date of Collection
 - Site Name/PV Plant Identifier
 - Location on site (String/Module #)

3. Send harvested connectors to:

Dr. Bruce King
 PO Box 5800, MS 0951
 Sandia National Laboratories
 Albuquerque, NM 87185-0951



At least 10" of cable should remain at both ends; the connector itself should be left intact and labeled

Figure 1. Example of a correctly harvested connector, with adequate cable length and proper labeling.

HOW TO IDENTIFY DEGRADED/FAILED PV CONNECTORS

Problems may be first identified at the inverter level, when performance drops, or at the string and module level, when aerial infra-red (IR) images reveal hot, i.e., failed, modules. Visual inspections of connectors can reveal melting (glossy appearance or deformation), corrosion of the connector and/or cable, arc fault, internal resistance indicated by high temperature readings on an infrared camera, abrasion of the cable sheath, exposed conductors, cross threading, misalignment, damaged or loose gland seals, and loose connection of the plug and socket.

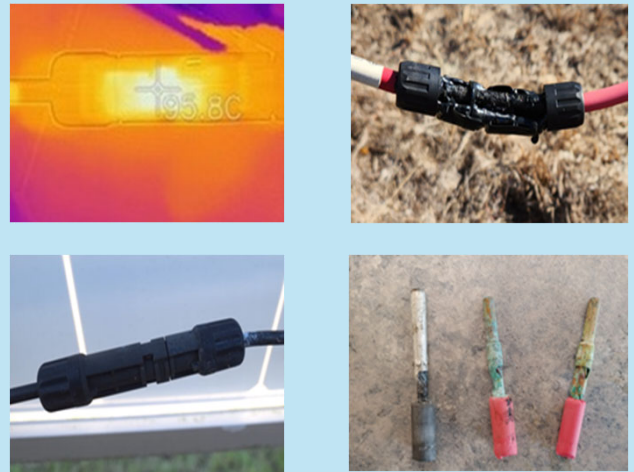


Figure 2. Left to Right: IR image of hot connector; melted connector; external signs of corrosion on the right cable; corroded socket and pins

For More Information Contact:

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Project Website:

- <https://energy.sandia.gov/pv-connectors>



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