

PV Reliability, Operations & Maintenance Workshop

Sandia National Laboratories and the Electric Power Research Institute (EPRI) are delighted to host the 2014 PV Reliability & O&M workshop, a focused and interactive conference exploring the technical issues related to PV systems and technologies. Among the topics that the PV Reliability and O&M workshop will examine are current and conceptual O&M approaches for improving plant performance and reducing the levelized cost of solar electricity, advances in component reliability, and data-driven strategies for performing economically efficient system upkeep.

7:30am

Badging/Registration Opens

7:30 – 8am

Continental Breakfast

8 – 8:45am

Welcome & Introduction

An overview of the day-long workshop will be presented, along with intended outcomes, goals, and next steps.

- **Opening Remarks / Workshop Purpose**
Sandia National Laboratories / EPRI
- **Industry Research & Development Roles**
Sandia National Laboratories / EPRI
- **Attendee Introductions**
Name, Company/Role (what are you known for?), Reason/Motive for Attending

8:45 – 10:15am

O&M Market Perspective

Several presentations will provide a compare and contrast of outlooks and priorities surrounding the O&M function.

- **The IE Perspective**
Emily Leslie – Black & Veatch
- **O&M Provider Perspective**
Mike Anderson – SunSystem Technology
- **Utility Perspective**
Jim Hansen – Arizona Public Service
- **Finance Perspective**

Renewable Energy Trust (unconfirmed)

10:15 – 10:30am

Networking Break

10:30 – 11:30am

Rethinking Inverter Reliability and PV System Design

Field testing research results will convey attainable improvements to PV component reliability and system design through novel measurement and evaluation techniques.

- **Inverter Reliability Research & Modeling**
Jack Flicker – Sandia National Laboratories
- **Commissioning PV Systems with an O&M Focus**
Paul Hernday – Solmetric / SunSpec

11:30am – 12:30pm

Advances in O&M – Part I

A range of innovative PV O&M practices will be discussed. Part 1 of this session will focus on the use of UAVs and integrating SCADA into PV system O&M.

- **Panel Discussion – Using Unmanned Aerial Vehicles (UAVs) for O&M**
Paul Bingaman – InspecTools
Rob Andrews – Calama Consulting
Garth Reynolds – SolarCity
- **Integrating SCADA into O&M**
Kevin Suhr, AlsoEnergy

12:30 – 1:30pm

Lunch

1:30 – 2:45pm

Advances in O&M – Part II

Additional innovative PV O&M practices will be shared. Among the topic to be examined during Part 2 of this session will be robotic solutions for PV O&M and a novel approach to scheduling planned maintenance.

- **Panel Discussion – Automated O&M Services**
Jesse Atkinson – Alion Energy
Kyle Cobb – Greenbotics (SunPower)
- **PV System Health Characterization and Loss Analysis using Operation Data**

Karel De Brabandere – 3E

- **PV Plant Operational Efficiency**

Gina Binnard – Belectric

2:45 – 3:15pm

From a System to a Systems Perspective

PV components are tested for initial quality and accelerated aging to gain insights into performance impacts. But this may or may not replicate actual operational behavior. Sandia research efforts to capture real-time field data and gain insights into PV system reliability will be related, as will analysis of how both operational and maintenance activities effect performance and cost.

- **PVROM Results to Date, Current Research, Practical PVROM Benefits to Industry**

Geoff Klise and Colin Hamman – Sandia National Laboratories

3:15 – 3:30am

Networking Break

3:30 – 4:30pm

PV O&M Roundtable

To advance O&M practices for boosting PV system performance, reducing PV system costs, and enhancing overall reliability, participants will have the opportunity to partake in one of three breakouts:

- How to simplify O&M in practice
- How to make O&M activities more predictable
- How to make O&M actions more effective

Results will be used to inform best practices/protocols and standards development.

4:30 – 5pm

PV O&M Standards Development

A review of both best practices and standards efforts that are aimed at filling the gaps for ensuring quality O&M activities will be reviewed. Many efforts have commenced in the past year and this time will be used to discuss coordination between each group and discuss gaps in knowledge/coverage.

- **Integrating Efforts Across Standards Working Groups**
- **PV O&M Gaps Analysis – Final Results**

John Balfour – High Performance PV

5:00 – 5:15pm

Wrap-Up & Closing Remarks

- **Workshop Summary and Call to Action/Next Steps**
Nadav Enbar – EPRI

*****Note** ASTM WK43549 Installation Commissioning Operation Maintenance (ICOMP) working group will be meeting on Thursday May 8 from 8am-1pm at EPRI. Participants are encouraged to attend, or send someone from their organization.***