Save the Date and Call for Abstracts

Sandia-EPRI 2016 PV Systems Symposium

May 9-11th at the Biltmore Hotel in Santa Clara, CA

Sandia National Laboratories (SNL) and the Electric Power Research Institute (EPRI) are delighted to host this symposium on the technical challenges and opportunities related to solar photovoltaic (PV) systems and technologies. Core areas of focus will include PV performance modeling, distribution hosting capacity and screening methods, component reliability, and the PV system lifecycle.

NEW THIS YEAR! We encourage interested parties to submit proposals for presentations to be included in the symposium's program. This is a competitive process, so inclusion in the program is not guaranteed. Please review the topic areas described below for each session and submit the following information to the organizer of the relevant workshop: Name, Affiliation, Title, and Brief Description of your presentation. Proposals should be submitted by ***March 4, 2016****.*

5th PV Performance Modeling Workshop – Monday, May 9th

Lead Organizer: *Joshua Stein, Sandia National Laboratories (jsstein@sandia.gov)*

This one-day workshop will consist of four sessions covering the following topics:

- ***Solar Resource Data Sources and Uncertainty***
  The available choices for irradiance and weather data inputs, including satellite and ground based datasets, will be reviewed. Data providers and researchers will relate the uncertainties in these data and their implications for PV performance modeling.
- ***Spectral Corrections for PV Performance Modeling***
  PV performance models currently model the spectral response of PV technologies in a variety of ways. Some models use air mass as a proxy, others neglect spectral corrections for certain technologies. This session will explore recently developed methods that more accurately represent spectral corrections using readily available data.
- ***Modeling Challenges for New PV Technologies***
  Existing PV performance models are unable to represent every new technology that enters the market. This session will showcase novel models and approaches to characterize new and future PV technologies, including: bifacial PV, low-X reflectors, module and array-scale power electronics, novel array designs, and advanced inverters.
- ***PV Modeling Tools Update***
  Developers of PV modeling software packages will review new and soon-to-be-released features. Attendees will also have the opportunity to recommend new features.

Side Meeting: PVLIB for Matlab and Python (Tuesday, May 10th)

Lead Organizer: *Joshua Stein, Sandia National Laboratories (jsstein@sandia.gov)*

This smaller meeting (limited to ~35 people) is intended for active users of the PVLIB toolbox (either in Matlab or Python). The main developers of these toolboxes would like to gather a group of active users to discuss the present and future states of these tools. The session will start with several presentations covering the main features and differences between versions. An open discussion will follow along with time to collaborate on some coding projects. This latter activity will include a forum for questions and technical support. Topics to be covered:

- Current status of the PVLIB and plans for the future
- How the two versions can be synchronized and/or whether they should be different
- Gaps to focus on for new development
- PVLIB community meet and greet.

PV Grid Integration into Distribution Workshop – Tuesday, May 10th

Lead Organizers: *Tom Key, EPRI; Robert Broderick, Sandia National Laboratories (rbroder@sandia.gov)*

This one-day workshop will help attendees identify methods and best practices for integrating PV into the distribution system, assessing the risk of system impacts for high PV deployment levels, and eliminating interconnection barriers. Proceedings will cover the following topics:

- ***Distribution Modeling for Planning and Screening***
  Data and modeling needs as well as new and existing capabilities for PV screening and distribution system planning will be discussed. Dialog will include basic data requirements, hosting capacity, and new methods (such as QSTS) for modeling how PV systems can impact the distribution system. Review of current interconnection and screening practices, including California's Distributed Resource Plans, will also occur.
- ***Advanced Inverter Functionality***
  This session will highlight the technical evolution of advanced inverters in utility distributed applications, focusing on new advanced functionality, modeling challenges, and lessons learned. Discussion will encompass the increased hosting capacity provided by volt/var, default inverter settings, various ride-through requirements, and black start policies that are changing integration requirements (e.g., interoperability requirements and standards).
- ***Technical and Policy Challenges of High Penetration PV on the Distribution System***
  This session will focus on the wide range of issues associated with accommodating high levels of PV.

- ***Distributed Control and Operation Management with High PV Deployment Levels***
  This session will focus on advanced distribution management systems (ADMS) and operation strategies with high penetration PV, such as distributed energy resource management systems (DERMS) and volt/var optimization (VVO).
- ***Solar Variability Impacts to the Distribution System***
  Solar variability impacts to the distribution system and techniques for managing variability, such as through the use of energy storage, will be examined. Solar forecasting for grid integration of PV will also be discussed.
- ***Commercial Software Capabilities and Recent Improvements***
  Commercial software developers will describe how to use existing distribution modeling software for evaluating the effects of PV systems on distribution planning.

PV Life Cycle Workshop – Wednesday, May 11th

Lead Organizers: *Geoff Klise & Olga Lavrova, Sandia National Laboratories*; *Nadav Enbar, EPRI (nenbar@epri.com)*

This workshop will explore methods and approaches to improving the life cycle value of PV systems (i.e., enabling enhanced performance and, in turn, improved project economics). PV life cycle will be discussed through reliability and O&M lenses, and organized around the following topics:

- ***Lessons Learned from O&M: Improving Current and Future PV System Design***
  This session will explore EPC, Asset Manager, and O&M provider experiences on how to improve project design, specification, and construction for the next generation of PV plants. Topics will include case studies and best practices using feedback mechanisms to ensure that new plants are taking lessons learned (both good and bad) and applying them to the next generation of PV plants.
- ***Budgeting for PV Plant O&M***
  Expected to meet production thresholds over a 20-30 year timeframe, PV plants require a steady diet of O&M oversight to meet contractual terms. However, industry best practices are only just beginning to emerge, and O&M budgets appear to vary widely. This session will examine the PV O&M budgeting process along with guiding rationales, before detailing perspectives on current and potentially future plant upkeep activities and price points.
- ***Reliability Analysis of PV Plus Storage***
  These talks will look at how energy storage and PV are addressing performance reliability concerns and what types of O&M activities are needed to maintain a high degree of plant uptime. More broadly, the session will assess the impact that storage brings to solar's lifecycle value equation.

- ***Deep Dive into the Reliability and Lifetime of PV Systems***

  This session is intended to investigate a variety of relevant topics, including:

  - Failure and performance degradation types in a PV system with/without storage
  - Scenario analysis and how to treat catastrophic failures
  - Life cycle Preventative Maintenance (PM) strategies to achieve greater reliability
  - End-of-life disposal/recycling issues
  - Modern machine learning algorithms for developing Predictive Maintenance (PdM) strategy
  - PM and PdM levelized cost of electricity (LCOE) and/or return on investment (ROI) calculations.

Who should attend? All stakeholders who care about PV performance: Utilities, PV system developers, EPCs, plant owners, integrators, independent engineers, model developers, inverter and inverter component manufacturers, researchers, O&M providers, and asset managers.

Why attend? Develop active collaborations. Help define future standards and best practices. Advance solutions to issues and costs in the PV industry. Obtain information about ongoing applied research at Sandia, EPRI, and other organizations. Expand your network. Broaden the knowledge base with a focus on PV systems optimization.

***Registration fee**: $150 per day, workshop or $375 for all three days. These fees include entrance to workshops, lunch, and coffee breaks.*

Please stay tuned for the workshop agendas and registration information!