



Southern California Edison Grid Integration Evaluation

Cooperative Research and Development Final Report

CRADA Number: CRD-10-376

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In accordance with Requirements set forth in Article XI, A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

Parties to the Agreement: Southern California Edison Co.

CRADA Number: CRD-10-376

CRADA Title: Southern California Edison Grid Integration Evaluation

Joint Work Statement Funding Table Showing DOE Commitment:

Estimated Costs	NREL Shared Resources
Year 1	\$ 800,000.00
Year 2	\$ 800,000.00
Year 3	\$ 800,000.00
Year 4	\$ 600,000.00
TOTALS	\$3,000,000.00

Abstract of CRADA Work:

The objective of this project is to use field verification to improve DOE's ability to model and understand the impacts of, as well as develop solutions for, high penetration PV deployments in electrical utility distribution systems. The Participant will work with NREL to assess the existing distribution system at SCE facilities and assess adding additional PV systems into the electric power system.

Summary of Research Results:

This project focused on the modeling, laboratory testing, quantification, and field demonstration of the impacts of high-penetration PV grid integration of utility-scale (1-5 MW) PV systems on the distribution system. Significant research results were determined in each of these areas. The highlighted research results of this project were: the dissemination of a method to generate high spatial and temporal PV power output data, the development of a method to evaluate the impacts of high-penetration PV via the modeling of salient operating points of the distribution system, the first power hardware-in-the-loop (PHIL) laboratory testing of a large (500 kW) PV inverter, PHIL testing of PV inverters for island detection performance, the quantification of PV impacts via distribution-system-level data collected over a two year time frame, and the field demonstration of two large-scale PV inverters using advanced PV inverter functions to mitigate

PV impacts. Additionally, the culmination of the projects findings has been compiled into a handbook for use by distribution engineers.

Subject Inventions Listing:

No inventions were filed during this project.

Report Date:

5/19/15

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