Brooks Engineering
3949 Joslin Lane, Vacaville, CA 95688
Voice (707) 332-0761

William F. Brooks, PE

Synergistic Activities

- Helped facilitate the development and expansion of domestic and international markets for grid-connected PV systems for the past 36 years.
- Performed dozens of fire investigations related to PV systems and documented the root cause of the fire and methods to mitigate future incidents.
- Developed permitting and inspection guidelines used widely throughout the United States to streamline the process and reduce the soft costs of implementing PV systems.
- Provides PV system inspection services for financiers, jurisdictions, and attornies.
- Provided training for more than 17,000 electricians, PV system installers, building officials, and inspectors over the past 30 years for government and private entities.
- Developed inverter eligibility requirements for California and managed the eligible inverter list for 8 years for the California Energy Commission. This list is used nationwide.
- Facilitated the development of the initial Rule 21 distributed energy resource interconnection standards for California.
- Key developer of nationwide interconnection requirements for PV systems.
- Written several widely-used guides and articles for installers, inspectors, and owners of PV systems.
- Designed and installed all types of PV systems from small off-grid systems for clinics in India to large utility-scale multi-megawatt PV systems.

Education and Training

North Carolina State University, Raleigh, North Carolina
Degree: Mechanical Engineering, Master of Science, 1992
North Carolina State University, Raleigh, North Carolina
Degree: Mechanical Engineering, Bachelor of Science, 1986 -- Magna Cum Laude
High School Valedictorian, Ben Lippen High School, Asheville, North Carolina, 1982

Professional Experience

2005 – Present **Brooks Engineering** Vacaville, CA
Principal Engineer
Provide consulting engineering services to a wide variety of PV industry clients and government agencies. Consulting areas include codes and standards compliance, fire investigation, permitting, inspection, interconnection, safety, system design services, technical manual development, systems analysis, operation and maintenance, and troubleshooting of PV Systems.

1998 - 2004 **Endecon Engineering** San Ramon, CA
Project Engineer
Developed and directed technical training program at the California Energy Commission for PV system installers and code officials. Worked with utilities and other related organizations on interconnection standards and agreements for PV systems. Helped develop national PV installer standards with the North American Board of Certified Energy Practitioners. Provided a wide variety of consulting services to large and small PV companies and governmental organizations.

1988 - 1998 **North Carolina Solar Center** Raleigh, NC
Solar Engineering Specialist
As one of four founding staff, coordinated all engineering-related activities of the N.C. Solar Center including analytical studies, and evaluation of solar products under development.

Professional Affiliations

- Member of National Electrical Code®(NEC), Code-Making Panel No. 4 for Articles 690, 691, 692, 694, 705, and 710 since 2009. Appointed chair of NFPA firefighter safety task force for PV installations by CMP No.4. Appointed chair of NFPA Large-Scale PV Electric Supply Station task group by CMP No.4 that drafted NEC Article 691, Large-Scale PV Electric Supply Stations.
- Registered Electrical and Mechanical Professional Engineer in California.
- Code Official Panel lead for Solar America Building Codes committee for U.S. Dept. of Energy.
- Former member of the board of directors of the American Solar Energy Society and the Solar Ratings and Certification Corporation.
- Member of technical review committees for IEEE-929, IEEE-1547
- Member of Standards Technical Panel for UL1741, UL3741, UL1703, UL2703, and UL9540.
- Member of IEC TC82 Working Group 3 and Working Group 6 covering international PV standards for PV components and systems.

Publications

- PV and the NEC, 3rd Edition, Bill Brooks and Sean White, Routledge, June 2023. 316-page book.
- Connection of Normal and Emergency Power Sources for Homes, International Association of Electrical Inspectors Magazine, March-April 2020.
- Hot Topics for PV System Installations, International Association of Electrical Inspectors Magazine, January-February 2017.
- The Heat Is On: Fault Detection and Fire Prevention, SolarPro Magazine, November/December 2015 Issue 8.6.
- Field Guide for Testing Existing Photovoltaic Systems for Ground Faults and Installing Equipment to Mitigate Fire Hazards, National Renewable Energy Laboratory, October 2013.
- Inverter Ground-Fault Detection "Blind Spot" and Mitigation Methods, Solar America Board *for Codes and Standards, June 2013,* http://solarabcs.org/about/publications/reports/blindspot/index.html
- The Ground-Fault Protection Blind Spot: Safety Concern for Larger PV Systems in the U.S., Solar America Board for Codes and Standards, January 2012, http://solarabcs.org/about/publications/reports/blindspot/index.html
- Expedited Permit Process for PV Systems, Version 4, Solar America Board for Codes and Standards, February 2012, http://solarabcs.org/permitting.
- The Bakersfield Fire: A Lesson in Ground-Fault Protection, SolarPro Magazine, February/March 2011 Issue 4.2, http://solarprofessional.com/articles/design-installation/the-bakersfield-fire-a-lesson-in-ground-fault-protection
- Understanding the CalFire Solar Photovoltaic Installation Guideline, Version 1.0, Solar America Board for Codes and Standards, February 2011, www.solarabcs.org
- Field Inspection Guidelines for PV Systems, Version 1.1, Interstate Renewable Energy Council, June 2010, http://irecusa.org/wp-content/uploads/2010/07/PV-Field-Inspection-Guide-June-2010-F-1.pdf.
- Inspector Guidelines for PV Systems, Version 2.1, Interstate Renewable Energy Council, March 2006, http://irecusa.org/fileadmin/user_upload/NationalOutreachPubs/InspectorGuidelines-Version2.1.pdf
- A Guide to PV System Design and Installation, California Energy Commission Consultant Report Number 500-01-020, June 2001, www.energy.ca.gov/reports/2001-09-04_500-01-020.PDF