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Best Practices for Commercial Roof-Mounted Photovoltaic System Installation

 Springer

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ISSN 2193-6595

SpringerBriefs in Fire

ISBN 978-1-4939-2882-8

DOI 10.1007/978-1-4939-2883-5

ISSN 2193-6609 (electronic)

ISBN 978-1-4939-2883-5 (eBook)

Library of Congress Control Number: 2015940973

Springer New York Heidelberg Dordrecht London

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Printed on acid-free paper

Springer Science+Business Media LLC New York is part of Springer Science+Business Media
(www.springer.com)

Preface

Although PV systems provide many benefits to the environment, there are hazards associated with them being installed onto rooftops. The installation of PV systems on roofs creates electrical, fire, structural, and weather-related hazards that are not adequately addressed by current codes, standards, and guidance documents. Significant progress has been made in the past years (as will be identified in this report), but there are still gaps that need to be addressed.

The purpose of this book is to compile information on a wide variety of hazards and damage potential created by the installation of photovoltaic (PV) systems on commercial roof structures.

The book reviews recent major PV fire incidents including those at Bakersfield, CA, and Mount Holly, NC, Goch, Germany, DeLanco, NJ and LaFarge, WI, and concludes that much can be learned from these and other non-fire-related failure incidents, most of which are not documented in the public literature.

The book then summarizes basic performance categories associated with PV panel installation practice and identifies key installation features impacting this performance. These include performance under structural loading, wind loads, hail, snow, debris accumulation, seismic loads, and fire hazards including flammability of components, ignition hazards, and electrical hazards associated with fire fighter operations.

The book reviews existing information in the literature related to the best practices for installation to address the performance issues described above. A comprehensive reference section is provided.

Finally, an assessment of key gaps in available information and understanding of performance is presented, highlighting areas of additional needed work. These include:

- Long-term performance of PV modules
- Design for wind in the presence of deflectors and shrouds
- Long-term performance with respect to hail damage
- Design for accumulated snow load

Acknowledgments

Appreciation is extended to the Fire Protection Research Foundation for support to this project. Special appreciation is extended to Kathleen Almand and Casey Grant for their assistance in identifying resources and providing comments on the direction of research. The comments and input from the Project Technical Panel helped to direct the study and improve the final report.

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