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Securing Solar for the Grid (S2G)

National Renewable Energy Laboratory
Award # 38445
October 2021–September 2024
Presented on: September 12, 2024

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Team Members: Ryan Cryar, Zoe Dormuth, Jordan Peterson, Chelsea Neely, Emily Waligoske

Standards Development and Best Practices

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Moderated by:

Danish Saleem
National Renewable Energy Laboratory

Panelists

Aung Thant
NERC

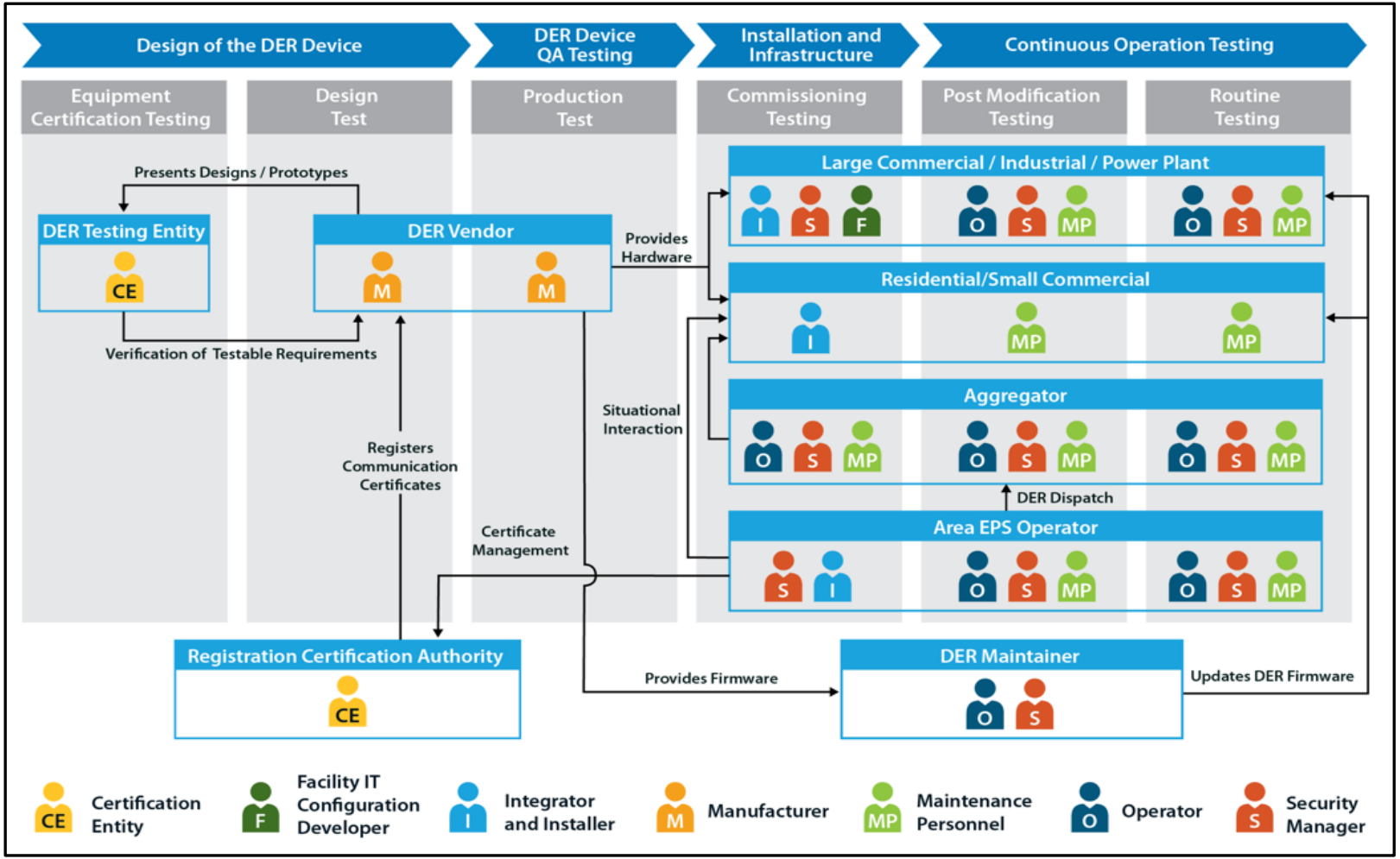
John Franzino
Grid Security, Inc.

Andre Ristaino
ISA

David Benton
Berkshire Hathaway Energy

Mike Slowinske
Underwriters Laboratories

How Recently Developed Standards Would Affect Product Lifecycle & Associated Stakeholders



Key Milestones for NREL

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Cybersecurity Certification Standard	Cybersecurity Guide for DERs	Solar PV Supply Chain Cybersecurity	DERMS Cybersecurity
Lead the development of a cyber certification standard for solar PV industry	Develop a guide with recommendations for cybersecurity of DERs i.e., IEEE 1547.3	Analyze and document the gaps in the supply chain cybersecurity for DERs	Identify applicable cybersecurity standards and/or guidelines for DERMS
Develop test guidance to support UL 2941 certification standard	Integrate cybersecurity recommendations into IEEE 1547 standard	Publish cybersecurity recommendations for solar PV industry	Identify cybersecurity considerations for DERMS
Support consensus development for UL 2941 among OEMs, utilities, installers, and aggregators		Lead a solar supply chain cybersecurity workshop	Develop cybersecurity risk profiles for DERMS

Through S2G, NREL co-led the development, coordination, and consensus development of 1) cyber certification standard, 2) cybersecurity guide, 3) cyber recommendations for supply chain and 4) DERMS cybersecurity for solar technologies to help secure the clean energy transition.

Impact of NREL's Work Through S2G

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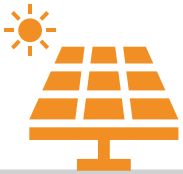
Led S2G proposal in FY 2018

Chaired the laboratory coordination committee (LCC) for last two years. Serving as vice chair this year.

Co-led the development of UL 2941 OOI for solar cybersecurity certification standard

Co-led the development IEEE 1547.3 cybersecurity guide for DERs



Gap analysis for DER supply chain cybersecurity

Supply chain cybersecurity recommendations

DERMS cybersecurity risk profiles

Coordination of cybersecurity requirements from key industry stakeholders

Testing guidance for PV inverters

LCC structure such as charter, graphic, information page, invitation emails, etc.

Co-hosted LCC meetings, recruited members, and much more

Impactful reports and papers to pave the way for new standards, certifications, tools, and recommended practices

The project supported a **first of its kind cybersecurity certification standard** that can be used to validate cybersecurity posture of solar PV inverters before deployment and while in the field.

Contribution Towards Standards Development

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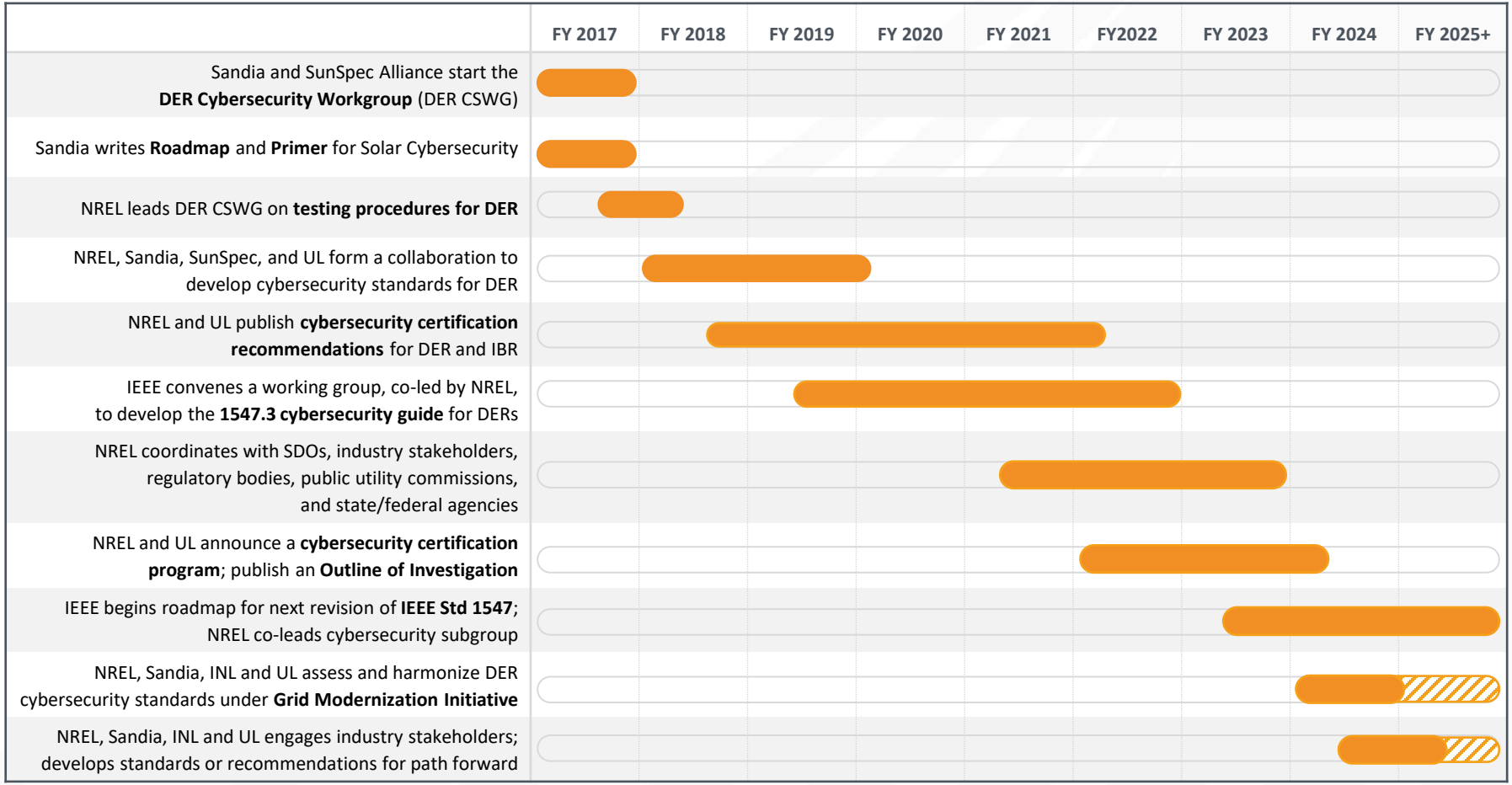

UL 2941: Cybersecurity Certification Standard

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IEEE 1547.3: Cybersecurity Guide for DERs

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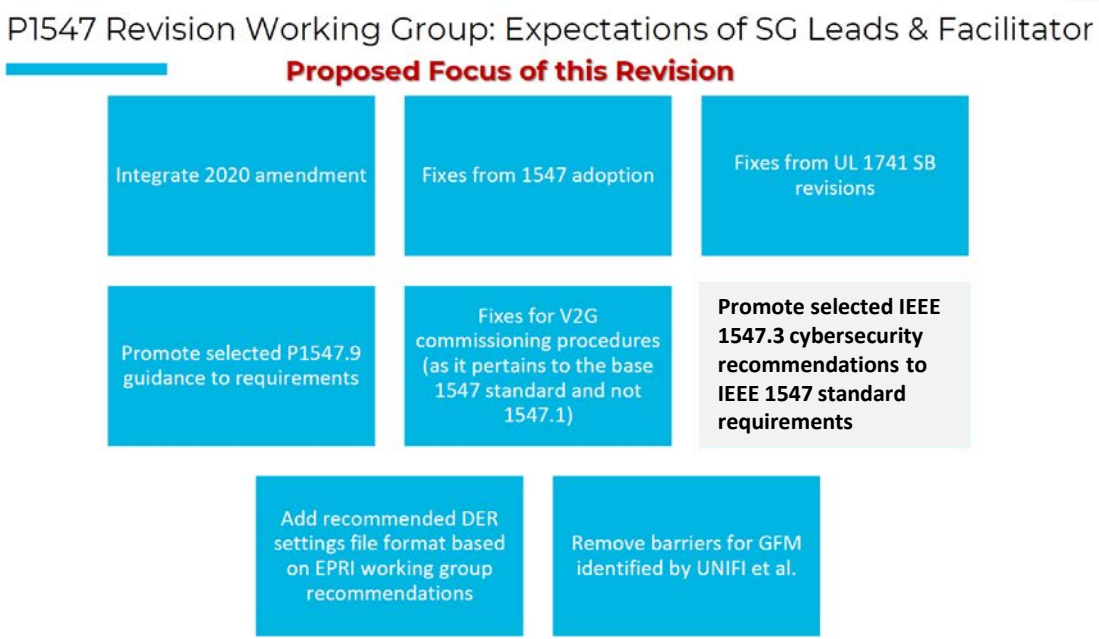
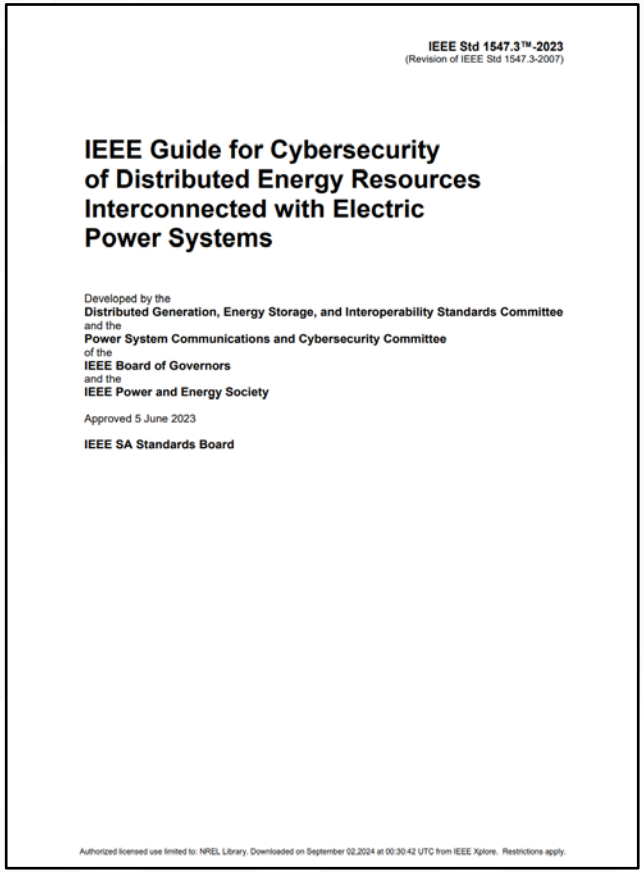



IEEE Std 1547.3™-2023
(Revision of IEEE Std 1547.3-2007)

IEEE Guide for Cybersecurity of Distributed Energy Resources Interconnected with Electric Power Systems

Developed by the
Distributed Generation, Energy Storage, and Interoperability Standards Committee
and the
Power System Communications and Cybersecurity Committee
of the
IEEE Board of Governors
and the
IEEE Power and Energy Society

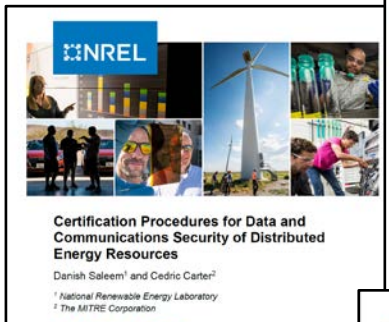
Approved 5 June 2023

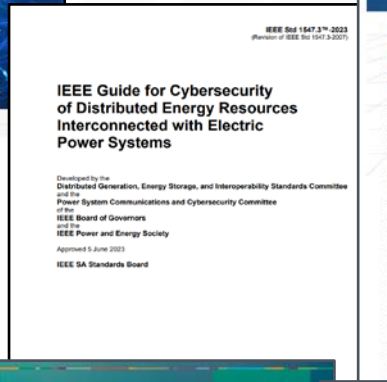
IEEE SA Standards Board

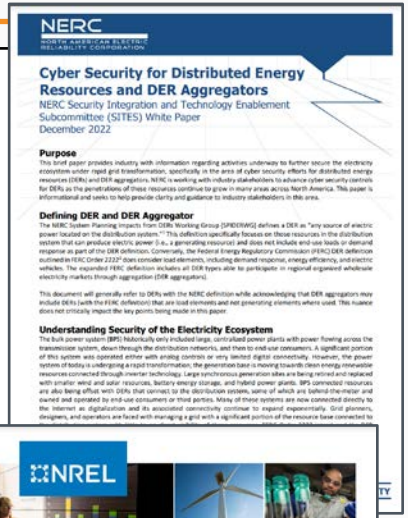
- IEEE 1547.3 cybersecurity guide published in December 2023 after being approved by the working group and standards coordination committee
- It was added to the IEEE 1547 standard revision timeline

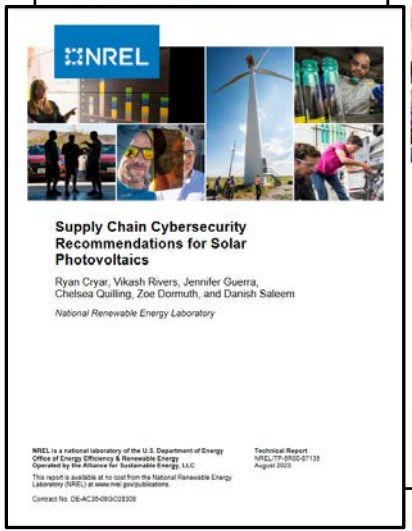
https://ieeexplore.ieee.org/document/10352402/keywords#keywords

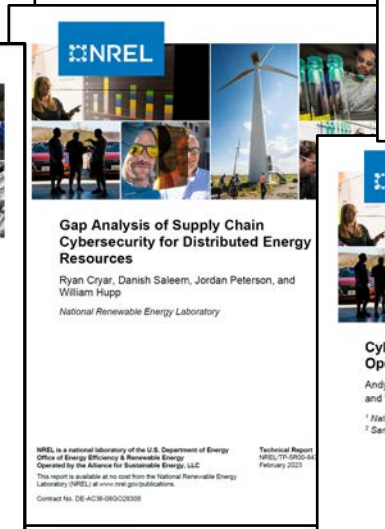
Publications

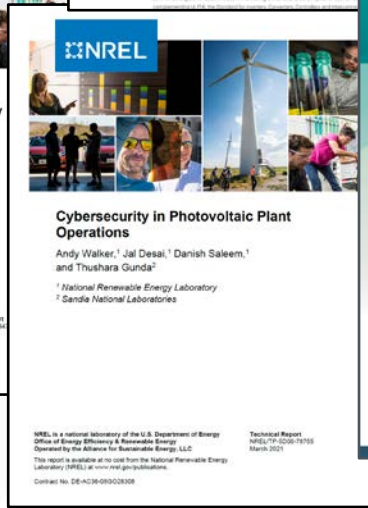


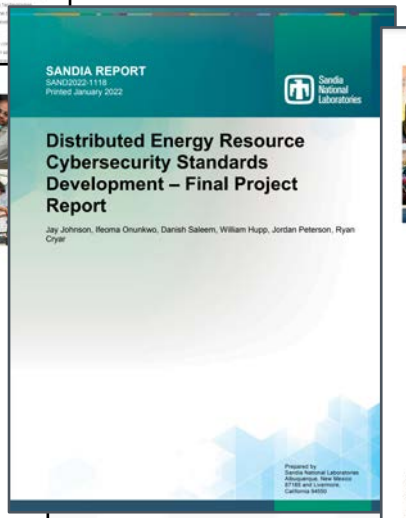


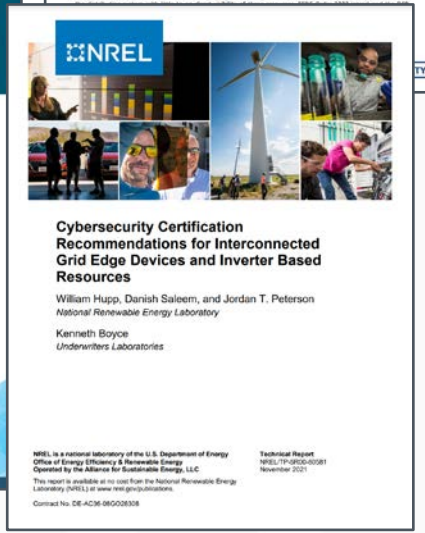












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Thank You

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