

DAREN T. SLEE, P.E., CFEI
SENIOR MANAGING CONSULTANTdtslee@engsys.com

Mr. Slee specializes in electrical engineering issues involving electrical failure analysis, preproduction circuit safety and functional analysis and testing, electrical reliability analysis, arc flash explosion investigation, utility power and transformer failure analyses, electrocution investigations, as well as printed circuit board and electrical component failure analysis, and the electrical root cause of fires.

Mr. Slee is a well-known expert in battery failure analysis and a contributor to Linden's Handbook of Batteries, Fourth Edition, Appendix H: Methodologies for Battery Failure Analysis. He has performed many failure analyses of lithium-ion batteries, as well as failure analyses and general analyses of batteries of other chemistries concerning nickel metal hydride, lead acid batteries, Zinc-Air, and Vanadium-Redox.

Mr. Slee's experience includes printed circuit board failure analysis specifically as a result of their insulating materials. He is familiar with the many possible root causes of insulating material failures, from degradation due to long-term heating or humidity, conductive anodic filament formation, and electrical component failure. He also has experience in failure analysis of other electrical insulating systems that lead to overheating.

Mr. Slee has expertise in testing electronic systems for safety and functionality. He has performed many investigations focused on reliability and is very familiar with the tools of reliability engineering including failure modes and effects analysis (FMEA), mean time between failure (MTBF) calculations, single (and double) points of failure (SPOF) analysis, and parts derating evaluation.

Areas of Specialization

Electrical component failure analysis
Circuit board failure analysis
Failure calculations
Single points of failure analysis
Parts derating evaluation
Electrical arc flash explosions
Household wiring
Utility substations
High voltage systems and transformers

Education

B.S., Electrical Engineering, San Jose State University, 1999



Licensed Professional Engineer (P.E.)

State of California	License No. 17506
State of Oregon	License No. 93318PE
State of Washington	License No. 56017
Certified Fire and Explosion Investigator	#18758-10421

Professional Affiliations/Honors

Institute of Electrical and Electronic Engineers (IEEE)

IEEE Senior Member No. 40288467

Elected Member of the Board of the IEEE Product Safety Engineering Society
January 1, 2018 to December 31, 2020

Chair of the SPCE 2020 Virtual conference arranged by the Product Safety Engineering Society

Member of the Portable Computer Battery Working Group
Revised the IEEE Std 1625 IEEE Standard for Rechargeable Batteries for Multi-Cell Mobile Computing Devices from 2004 version to the 2008 revision, IEEE Power & Energy Society, Sponsored by the Stationary Batteries Committee

Secretary of the Oregon and Southwest Joint Chapter, IEEE Product Safety Engineering Society and Electromagnetic Compliance Society

San Jose State University

First Place, San Jose State University's Electrical Engineering Senior Skills Audit Exam
Two consecutive years as Dean's Scholar at San Jose State University

Positions Held

Engineering Systems Inc., Clackamas, OR

Senior Managing Consultant, 2021 – Present

Exponent, Portland, OR

Senior Managing Engineer, 2018 – 2021

Jensen Hughes, Portland, OR

Senior Electrical Engineer, 2016 – 2018

Exponent, Menlo Park, CA (2000 – 2004); Los Angeles, CA (2005 – 2016)

Senior Managing Engineer, 2000 – 2016

Continued Education

National Association of Fire Investigators (NAFI); Certified Fire and Explosion Investigator (CFEI) online training, 2019

Book Chapters

Horn Q., Hayes T., **Slee D.**, White K., Harmon J., Godithi R., Wu M., Megerle M., Singh S., Mikolajczak C. Linden's Handbook of Batteries, Fourth Edition, Appendix H: Methodologies for Battery Failure Analysis. Edited by Thomas B. Reddy, 2011

Publications/Presentations

Slee D. Resistive Propagating Printed Circuit Board Faults. Presentation to 2016 IEEE Symposium on Product Compliance Engineering, May 2016.

Slee D. Resistive Propagating Printed Circuit Board Faults. Presentation by invitation at Tesla Motors, Palo Alto, CA, March 2016.

Bosco J., Tanaka Z., Ott B., **Slee D.** The efficacy of fire-fighting foams for disrupting power generation from silicon solar panels. 2015 IEEE Photovoltaic Specialist Conference (PVSC), New Orleans, LA, June 14–19, 2015.

Slee D. Failure Mode & Effects Analysis (FMEA) methods and accelerated testing concepts. Presentation to 2015 IEEE Symposium on Product Compliance Engineering, May 2015.

Slee D. Failure Mode & Effects Analysis (FMEA) methods and accelerated testing concepts. Presentation to Product Safety Engineering Society San Diego Chapter, December 2014.

Slee D. Failure Mode & Effects Analysis (FMEA) methods and accelerated testing concepts. Presentation to 2014 Testing and Certification Conference, organized by the School of Science and Technology, The Open University of Hong Kong, November 2014.

Ibrahim Z., Stepan J., **Slee D.**, Reza A. Forensic examination, and failure analysis of a 220 MV step-up transformer fire. Proceedings of ASME International Mechanical Engineering Convention & Exposition 2013, San Diego CA, November 15–21, 2013.

Slee D. Lithium-ion & lithium polymer batteries. Presentation to 2013 IEEE Symposium on Product Compliance Engineering, October 2013.

Slee D. Lithium-ion & lithium polymer batteries. Presentation to Product Safety Engineering Society Orange County Chapter, July 2012.

- Slee D.** Lithium-ion & lithium polymer batteries. Presentation to Product Safety Engineering Society San Diego Chapter, May 2012.
- Slee D.** Battery standards, regulations and beyond. Presentation at MicroPower Seminar, January 2012.
- Slee D.** Introduction to printed circuit board failures. Presentation to 2009 IEEE Symposium on Product Compliance Engineering, October 2009.
- Slee D.**, Stepan J., Wei W., Swart J. Introduction to printed circuit board failures. Proceedings, 2009 IEEE Symposium on Product Compliance Engineering, Product Safety Engineering Society, October 2009.
- Slee D.**, Loud J., Swart J. Arcing and fires. Proceedings, 2009 IEEE Symposium on Product Compliance Engineering, Product Safety Engineering Society, October 2009.
- Slee D.** Arcing and fires. Presentation to 2009 IEEE Symposium on Product Compliance Engineering, October 2009.
- Swart J., **Slee D.** Failure analysis methodology for battery powered product incidents. Presentation to 2008 IEEE Symposium on Product Compliance Engineering, October 2008.
- Swart J., **Slee D.**, Hu X. Failure analysis methodology for battery powered product incidents. Proceedings, 2008 IEEE Symposium on Product Compliance Engineering, Product Safety Engineering Society, October 2008.
- Slee D.** Presentation to the California Conference of Arson Investigators on battery safety issues and failure analysis; presentation included information on electrical circuit concerns and battery exothermic reactions, March 2008.
- Slee D.**, Martin R.J., Christiansen E. Vehicle, and vessel fires: When to retain an engineer. International Association of Special Investigation Units - Southern California Chapter Meeting, January 2008.
- Slee D.** Presentation to the Cellular Telephone Industry Association on battery failure analysis methodology, December 2007.
- Slee D.** Presentation to the San Fernando Valley Chapter of ASM International on printed circuit board propagating faults, April 2006.
- Slee D.** Presentation to the California Conference of Arson Investigators on battery safety issues and failure analysis; presentation included information on electrical circuit concerns as well as battery exothermic reactions, July 2006.
- Slee D.** Presentation to the San Fernando Valley Chapter of ASM International on battery safety issues and failure analysis, presentation included information on electrical circuit concerns as well as battery exothermic reactions, October 2006.

Slee D. Presentation to the 30th International Symposium for Testing and Failure Analysis (ISTFA), Printed circuit board propagating faults, November 2004.

Slee D. Printed circuit board propagating faults. Proceedings, 30th International Symposium for Testing and Failure Analysis (ISTFA), November 2004.