

Daniel R. Muller

PE

Staff Consultant



Mr. Muller is an electrical and computer engineer with expertise in the design and analysis of electrical and electronic systems, including data acquisition and field inspections. He is proficient in conducting system analysis using computer modeling and participating in utility distribution design projects. His background spans design, calculations, permitting, submissions, and construction support for electric utility transmission and distribution equipment.

Education

BS, Electrical Engineering & Computer Engineering. Southern Illinois University. 2022

Licenses & Certifications

- Licensed Professional Engineer No. 062.089560
- FCC Technician Operator Class License

Positions Held

Engineering Systems Inc., Aurora, Illinois

- Staff Consultant, May 2025 – Present

ENTRUST Solutions Group, Warrenville, Illinois

- Senior Design Engineer, September 2023 – May 2025

POWER Engineers, St. Louis, Missouri

- Electrical Engineer, May 2022 – August 2023
- Electrical Design Internship, May 2021 – August 2021

Continuing Education

Certified Fire and Explosion Investigator (CFEI) Training – National Association of Fire Investigators (NAFI), 2026

Contact Information

drmullerr@engsys.com

(630) 851-3721

ESi Aurora

4215 Campus Drive
Aurora, IL 60504

Areas of Specialization

- Electrical Utility Equipment
- Medium Voltage Systems
- Electrical Safety
- Batteries
- Solar

Professional Affiliations/Honors

Institute of Electrical and Electronic Engineers (IEEE)

- Member

National Association of Fire Investigators (NAFI)

- Member

Project Experience

Root Cause Analysis (RCA)

- Cooling fan failures – Investigated Battery Energy Storage System (BESS) fan failures through electrical testing and component examination.
- Electrical panel flood loss evaluation – Performed technical and cost analyses of flood-damaged electrical distribution equipment to assess repairability, replacement requirements, and associated losses.
- USB-C and USB-A cables – Evaluated cables with thermal tests and physical teardown to analyze overheating events.
- Swimming pool and spa equipment – Investigated circulating currents to determine code compliance.
- HVAC – Investigated screw compressor failures for large scale systems.
- Foam fire suppression systems – Investigated erroneous discharge.
- RV and marine shore-power systems – Investigated electrical failures and damage involving recreational vehicle and marine shore-power connections.
- Switchgear – Evaluated electrical failures involving switchgear, breakers, and buswork through inspection, and engineering analysis.

Fire Investigations

- Residential dehumidifier fires – Investigated origin and cause of fires involving compressor-driven moisture removal equipment, evaluated failure mechanisms.
- Air conditioner and heater fires – Conducted forensic examinations of residential HVAC appliances to determine ignition sources and electrical failure modes.
- Consumer electronics fires – Investigated mobile devices, laptop computers, and printer products associated with fire events, overheating, and electrical failures.
- Entertainment system losses – Investigated fires and failures involving televisions, audio, gaming, telemetry data acquisition devices, and associated consumer electronic equipment.
- Incense and specialty heater incidents – Examined heating appliances and consumer products involved in thermal events to determine ignition sequence and failure mechanisms.

- Clothes dryer fires – Investigated residential dryer fires involving electrical components, heating elements, motors, and lint accumulation.
- Cooking appliance fires – Performed analyses involving stovetops, hot plates, and toaster appliances to determine ignition mechanisms and contributing factors.
- Service entrance and utility power investigations – Evaluated failures involving utility conductors, metering equipment, service disconnects, and open-neutral conditions resulting in equipment damage or fire.
- Electrical component failures – Analyzed relays, high-limit switches, MOVs, power supplies, and other electrical components to determine failure mechanisms and event causation.
- LED lighting systems – Investigated lighting-related failures involving LED drivers, luminaires, controls, and associated electrical components.
- Rooftop solar photovoltaic systems – Examined PV modules, inverters, rapid-shutdown systems, combiners, and balance-of-system components associated with fire and damage events.
- Electric vehicles, scooters, and bicycles – Investigated fires and failures involving electric transportation devices, charging systems, and lithium-ion battery assemblies.
- Electric vehicle charging equipment – Evaluated Level 1, Level 2, and associated charging infrastructure for evidence of overheating, failure, and code compliance issues.
- Sauna and heating equipment – Investigated electrical and thermal failures involving sauna heaters, controls, relays, wiring systems, and associated accessories.
- Lithium-ion battery cell analysis – Examined cylindrical (18650 & 21700), pouch, and prismatic cells from various devices and packs to determine failure mechanisms, thermal runaway behavior, and contributing causes of fire events.
- BESS Fires - Characterized exemplar batteries with examination of internal features by physical teardown to evaluate internal features, cell construction, and failure mechanisms related to thermal events.

Design and Engineering

- Solar photovoltaic permitting and design – Reviewed solar photovoltaic system designs, permitting packages, equipment selections, grounding systems, and code-compliance documentation for utility interconnection to advise authority having jurisdiction approval.
- Multi-family electrical upgrades – Designed and evaluated electrical infrastructure upgrades for apartment and residential developments, including service sizing, circuit equipment, load calculations, and code compliance assessments.

Seminars Attended

- National Association of Fire Investigators (NAFI)
 - 2024 NFPA 70E Standard of Electrical Safety in the Workplace Series
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Publications

- E. M. Schultz, L. F. Bilancia, T. R. Nagourney, K. G. Cline, P. R. Ritchie and **D. R. Muller**, "MOV Thermal Runaway Features: Fire Cause vs. Effect," 2026 IEEE International Symposium on Product Compliance Engineering (ISPCE), Boston, MA, USA, 2026, pp. 1-7, doi: 10.1109/ISPCE69557.2026.11591488