Exponent®
Engineering & Scientific Consulting

John Loud, P.E., CFEI, CVFI

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Professional Profile

Mr. Loud specializes in electrical engineering issues. He addresses issues related to electronic systems including printed circuit board problems, electronic component failures, circuit analysis, and propagating failures.

Mr. Loud has investigated numerous incidences involving electrocutions and electric shocks and has also conducted many investigations involving electrical/electronic products that are alleged to have caused fires. His expertise further includes work with lighting products, rotating electric machines, as well as secondary battery systems in the area of lithium ion cell testing and protection systems, NiMH, NiCad, and lead acid charging systems.

His test results and recommendations for products using lithium ion cells have been used by many in the portable electronics industry. He has performed fault analysis on electrical distribution equipment, breakers and switchgear. Mr. Loud also has experience with industrial electronic equipment including automated metering equipment, locomotive black-box event recorders, and locomotive control equipment. He is experienced in addressing issues related to electronic manufacturing and service, equipment production, test and circuit board rework and repair. He is also experienced in applying relevant electrical codes and standards including the NEC, NESC, General Orders 95, 128, 165, OSHA, UL, ANSI, etc.

Prior to joining Exponent, Mr. Loud worked for Neta Corporation and Q-Tron Industrial Electronics and worked as a consultant for companies such as General Motors EMD Division, Burlington Northern Railroad, CSX Railroad, and the Atchison Topeka & Santa Fe Railroad.

Academic Credentials & Professional Honors

M.S., Electrical Engineering, San Jose State University, 1995

B.S., Electronics Engineering Technology, DeVry Institute of Technology, 1992

Tau Beta Pi

Eta Kappa Nu

Licenses and Certifications

Professional Engineer, Arkansas, #16740

Professional Engineer Electrical, California, #17564

Professional Engineer, Michigan, #6201058107

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Professional Engineer, Oklahoma, #27594

Professional Engineer, Oregon, #91186PE

Professional Engineer, Virginia, #402055983

Professional Engineer Electrical, Washington, #49008

Certified Vehicle Fire Investigator (CVFI)

Certified Fire and Explosion Investigator (CFEI)

Professional Affiliations

Institute of Electrical and Electronic Engineers—IEEE

Order of the Engineer (member)

Publications

Wright SA, Loud JD, Blanchard RA. Globules and beads: What do they indicate about small-diameter copper conductors that have been through a fire? Journal of Fire Technology 2015; 51(5):1051-1070.

Loud JD, Hu X. Failure analysis methodology for Li-ion incidents. Proceedings, 33rd International Symposium for Testing and Failure Analysis, pp. 242-251, San Jose, CA, November 6-7, 2007.

Loud JD, Murray SJ, Ray RM, Iyer M, Jackson O. Shock injury risk assessment of portable and handheld appliances and use environments. Proceedings, 57th Annual International Appliance Technical Conference, Rosemont, IL, March 27-29, 2006.

Loud JD, Murray SJ, Caligiuri RD. Failure modes in Calrod-type heaters used in home appliances. Proceedings, 57th Annual International Appliance Technical Conference, Rosemont, IL, March 27-29, 2006.

Loud JD. Vector control of an induction machine. Master's Thesis, San Jose State University, 1995.

Presentations and Published Abstracts

Loud JD. The science of electric shocks. Guest lecture at Stanford University, 2007, 2008, 2009.

Loud JD. Accelerated stress testing for home appliances. IEEE ASTR Conference, San Francisco, CA, October 2006.

Loud JD. Top ten failures in electronic circuits. Presented to Engineers at Apple Corporation, April 1997 and at Dell Computer Corporation, February 1998.

Loud JD. Electronic case history review—Learn from someone else's design mistakes. Presented to 300 Engineers at Hewlett Packard Corporation, November 1997.

Loud JD. Safety design of electronic circuits. Presented to IEEE in Austin, TX, February 1998.

Loud JD, Hsu P. Evaluation of vector controlled induction motors as joint actuators for industrial robots.

Proceedings, IASTED International Conference Robotics and Manufacturing, Honolulu, HI, August 19-22, 199.

Reports

Loud JD. Compact driver and controller Part II—Vector control. Report for General Electric Nuclear Energy, 1995.

Book Chapters

Loud JD, Blanchard R, Mimmack G. Electronic Failure Analysis Handbook. Chapters 16 and 20, McGraw Hill, January 1999.

Loud JD. Operations and Maintenance of the Datacord 2000 Locomotive Crash Recorder. Manual for Q-Tron Ltd., 1988.

Project Experience

2500 Amp Breaker Failure: Root cause failure analysis.

Arcing and Fire in Electrical Switch Gear: NEC Violations.

Hot Tub Controller Failure: Design defect resulted in recall.

Electrocution: Expert testimony: Cause of death and the role of an electrician’s fish tape.

Electrocution: Investigate the cause of death and document the site.

Numerous neon sign investigations.

100 KVA Distribution Transformer: Document tear down and subsequent testing.

4800/240 Transformer: Expert testimony: Evaluate 6 pole-mounted transformers supplying power to a building that caught fire.

112kV Transformer: Evaluate transformer windings to determine the root cause of the failure.

Rice Cooker Electrocution: Identified defect that caused electrical fault.

Heat Tape Testing: Investigate failure modes and potential for fire initiation.

Generator Winding Failure: Root cause failure analysis and prediction of susceptibility of remaining population.

Circuit Board Failure in ATM Machine: Root cause failure analysis and failure projection.

Lithium ion cell testing: Identify unsafe operating parameters. (Numerous types and form factors).

Lithium ion cell protective devices for notebook computers: Evaluated failure modes and circuit weaknesses in the protection electronics.

Metal Oxide Varistors, MOVs: Evaluate performance and failure modes.

Lithium ion cell protective devices for cellular phones: Evaluated failure modes and circuit weaknesses in

the protection electronics.

AC Adapters: Evaluated for potential failure modes including fire initiation.

15kV Vacuum Switch: Determine the root cause of distribution power factor correction control failures.

Transient Suppressor Failures: Evaluate the performance and failure mode of transient protectors used on wind turbine generating equipment.

Computer Monitors: Evaluate root cause failure analysis and potential for fire initiation.

Desktop Computer: Evaluate a burned computer and perform testing to determine whether it was the cause or the victim of a fire.

5kV Cable: Root cause failure analysis.

5kV Cable Splice: Identified workmanship-caused failure.

FM Transmitter Fire: Root cause failure analysis for radio station fire.

Water Level Controller: Identified an installation oversight that resulted in a flood.

Solar Simulators, Searchlights and Photovoltaic product line review.

Stepper Motor Failures in Eye Measuring Equipment: Root cause failure analysis.

Instantaneous Hot Water Heater: Evaluate the controller performance.

Instrumentation and Controls Evaluation at an Oil Refinery.

Review of Telephone Switching Equipment involved in a fire.

Project the reliability of telephone switching subjected to mechanical shock based on Bellcore standards.