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EDT Forensic Engineering & Consulting

ENGINEER: ELECTRICAL

EDUCATION

2010 — **Master of Engineering, Electrical Engineering**
North Carolina State University, Raleigh, North Carolina

2010 — **Graduate Certificate, Renewable Electrical Energy Systems**
North Carolina State University, Raleigh, North Carolina

1984 — **Bachelor of Science, Electrical Engineering**
North Carolina State University, Raleigh, North Carolina

1982 — **Bachelor of Science, Business Administration**
Appalachian State University, Boone, North Carolina

EXPERIENCE

August 2014 to Present — **Engineering Design and Testing Corp./EDT Engineers, P.C.**
Charlotte, North Carolina

Consulting Engineer, District Engineering Manager
Specialized consulting in the areas of electric power generation, transmission, distribution, and control systems, including synchronous and induction generators, power and distribution transformers, substations, switchgear, protective relaying, distribution and transmission lines. Analyses include design feasibility, reliability studies, root cause, damage assessment, and cost review. Additional consultation in direct stroke lightning, grounding, electrical contact and arc flash

October 2011 to August 2014 — **HDR**
Charlotte, North Carolina

Electrical Engineering Manager for the Charlotte Hydropower Department
Provided subject matter expert support to other hydropower offices, transmission, fossil generation, natural resources, transportation, and renewable energy groups. Project work included arc flash, power flow, short circuit, and protective coordination studies; generator rewinds; control system design; switchgear design; substation and transmission interconnection design; equipment evaluation; damage assessment; and economic feasibility studies.

September 1989 to October 2011 — **Utility Technology Engineers Consultants**
Asheboro, North Carolina

Founding partner of Regional Engineering Firm
Description Lead design projects for water and wastewater plant power distribution and control, utility fiber optic systems, data and communication networks (including SONET, OC-12, gigabit Ethernet, VoIP, and 900 MHz radio). Projects included a 13 MW emergency generation plant for a major university/medical center and 17.3 MW of municipal utility peak shaving capacity.

January 1985 to September 1989 **Black & Veatch, Inc.**
Asheboro, North Carolina

Electrical Engineer in Asheboro, North Carolina Office
Performed design work on electric distribution and transmission projects and power distribution and process control on water and wastewater projects

ANALYSIS/ DESIGN/ CONSULTING EXPERIENCE

Forensic Investigation 2019-2023; Summarized by file type

Construction Defect	4
Energy Audit	1
Equipment Assessment	1
Equipment Breakdown	63
Equipment Breakdown (Renewables)	28
Explosion	1
Fire Origin and Cause	104
Lightning	21
Personal Injury	11
Power System Analysis	10
Scope of Damage	9
Water Damage	26
TOTAL	279

Generation

Confidential Client, 90 MW Wind Farm — *Eastern North Carolina*

Root cause analysis and scope of damage assessment of inverter failure

Confidential Client, 6 MW Solar Farm — *Central North Carolina*

Scope of damage assessment of inverter failure

Confidential Client, 90 MW Wind Farm — *Central, Illinois*

Root cause analysis and scope of damage assessment of bushing failure on 76 MVA 138 kV to 34.5 kV transformer.

Confidential Client, 800 kW Photovoltaic Solar Plant — *Western North Carolina*

Root cause analysis and scope of damage assessment of 920 kVA transformer failure, Western North Carolina.

Confidential Client, 1.5 MW Photovoltaic Solar Plant — *Central North Carolina*

Root cause analysis and scope of damage assessment three phase fault on 25 kV utility interconnection.

Confidential Client, 5 MW Photovoltaic Solar Plant — *Eastern North Carolina*

Root cause analysis and scope of damage assessment of inverter failure.

Confidential Client, 300 kW Wind Turbine — *Northern Ohio*

Root cause analysis and scope of damage assessment of lightning damage to inverter control panel, nacelle indexer, and delamination of turbine blade.

Alcoa Power Generation Incorporated, Cheoah Hydroelectric Project — *North Carolina*

Commissioning of new switchgear, switchyard, exciters, and governors for five-unit 118 MW hydropower plant.

Alcoa Power Generation Incorporated, Yadkin Division — *Badin, North Carolina*

System wide arc flash study for four hydropower plants four switchyards, six transmission lines, and two switching stations.

Brookfield Renewable Energy Group — *Southeastern Maine*

Pre-bid evaluation of 70 MW of generation capacity at nine hydroelectric assets.

Consumers Energy Ludington Pump Storage Plant — *Mason County, Michigan*

Owner's engineer for 1,872 MW pumped storage plant overhaul – assisted with shop drawing and constructability review.

Crisp County Power Commission — *Crisp County, Georgia*

5 MW Hydropower generator stator rewind design, specification, procurement, and contract management.

Department of Water Resources — *California*

Fire and Life Safety Study - Lead electrical engineer for evaluation of life safety, fire protection, and business interruption analysis for 28 pumping and generation facilities with a capacity to deliver 2.6 million acre-feet (8.5 billion gallons) of water annually and generate 1,800 MW of electric power.

Rivanna Water and Sewer Authority — *Charlottesville, Virginia*

Technical and economic feasibility replacement of the electrical systems and repair of the generator, shaft, and turbine after a flood event.

United States Army Corps of Engineers, — *Savannah District, Savannah, Georgia*

Evaluation of the technical and economic feasibility of remote operation of three hydropower plants totaling 1,475 MW of generation capacity.

Voith Hydro Inc. — *York Pennsylvania*

Design of controls and stator temperature monitoring for eleven bulb turbine plants on the Ohio River.

Duke University — *Durham, North Carolina*

Design, procurement, construction, and start-up for 13 MW Central Generation Plant.

Lee County Resource Recovery Facility — *Lee County, Florida*

NERC internal reliability compliance assessment for 52 MW solid waste power plant and resource recovery facility.

Miami-Dade County Resource Recovery Facility — *Miami, Florida*

NERC internal reliability compliance assessment for 77 MW solid waste power plant and resource recovery facility.

SCADA

Duke Energy Progress — *Seneca, South Carolina*

Design engineer for remote metering and control for out of control area wholesale customer 100 kV delivery substations.

Marine Corp Air Station —*Cherry Point, North Carolina*

Project manager and lead SCADA and fiber optic engineer for project to design and install a new delivery substation, upgrade of 87 electromechanical relays with SEL 351 A and design, specification and procurement of a base wide SCADA system.

Board of Public Works — *Gaffney, South Carolina*

Responsible for design, specification, procurement, factory acceptance testing installation, database construction, testing, and commissioning of a UNIX based SCADA system using fiber optic communications at Duke 100 kV wholesale delivery substations, and 25 kV distribution substations. Project included design, specification, procurement, installation, testing and commissioning of single mode fiber optic communication network.

Commissioners of Public Works — *Greenwood, South Carolina*

Responsible for design, specification, procurement, factory acceptance testing installation, database construction, testing, and commissioning, of a UNIX based SCADA system using fiber optic communications at Duke 100 kV wholesale delivery substations, 25 kV distribution substations, natural gas delivery stations, and elevated water towers. Project included design, specification, procurement, installation, testing and commissioning of single mode fiber optic communication network.

Department of Energy Services — *Monroe, North Carolina*

Distribution SCADA System; Responsible for design, specification, procurement, factory acceptance testing installation, database construction, testing, and commissioning, of an Open VMS based SCADA system using fiber optic, FCC licensed 900 MHZ radio and 900 MHz spread spectrum radio communications. System included 47 RTUs at Duke 100 kV wholesale delivery substations, distribution substations, natural gas delivery stations, elevated water towers and sewer lift stations. Project included design, specification, procurement, installation, testing and commissioning of single mode fiber optic and radio communication network.

Electric Department — *Georgetown, South Carolina*

Responsible for design, specification, procurement, database construction, testing, and commissioning of a PC based SCADA system based on SEL relays and data concentrators; using fiber optic communications. System included SEL 351R relays, at SCE&G 100 kV wholesale delivery substations, distribution substations.

Transmission and Distribution

PPL Electric Utilities — Allentown, Pennsylvania

Investigation of the engineering for a $500 million reliability upgrade to 500 kV, 230 kV, and 69 kV transmission and substation facilities in the PJM Regional Transmission Organization (RTO).

Lower Valley Energy — *Jackson, Wyoming*

Investigation of structural failure of 17 double circuited 115 kV transmission structures during wind event.

City of Bristol, Tennessee

Investigation of phase to phase underground primary cable fault.

Bonneville Power Administration — *Portland, Oregon*

QA/QC engineer for design of 500 kV and 230 kV substations - various substations.

Department of Public Utilities — *Orangeburg, South Carolina*

115 kV transmission current differential and step distance relays and self-healing OC-3 and OC-12 SONET communication loop that included voice, data, relaying and SCADA.

Municipal Electric Association of Georgia

Design of 115/12.47 kV five feeder substation.

High Point, North Carolina, Electric Department

100 kV transmission current differential and step distance relays and fiber optic communication channel that included voice, data, relaying and SCADA.

REGISTRATIONS and CERTIFICATIONS

Registered Professional Engineer in Alabama (#PE51945)

Registered Professional Engineer in Arkansas (#22245)

Registered Professional Engineer in California (#20997)

Registered Professional Engineer in Connecticut (#PEN.0034391)

Registered Professional Engineer in Florida (#91018)

Registered Professional Engineer in Georgia (#039434)

Registered Professional Engineer in Kansas (#30469)

Registered Professional Engineer in Kentucky (#34502)

Registered Professional Engineer in Louisiana (#PE.0046253)

Registered Professional Engineer in Maine (#PE18461)

Registered Professional Engineer in Maryland (#57853)

Registered Professional Engineer in Massachusetts (#58389)

Registered Professional Engineer in Michigan (#6201066593)

Registered Professional Engineer in New Hampshire (#15482)

Registered Professional Engineer in New Jersey (#24GE05864700)

Registered Professional Engineer in New York (#102611)

Registered Professional Engineer in North Carolina (#015448)

Registered Professional Engineer in Ohio (#E-80292)

Registered Professional Engineer in Pennsylvania (#PE092566)

Registered Professional Engineer in South Carolina (#15418)

Registered Professional Engineer in Tennessee (#117764)

Registered Professional Engineer in Texas (#135772)

Registered Professional Engineer in Vermont (#018.0135415)

Registered Professional Engineer in Virginia (#0402024204)

Registered Professional Engineer in West Virginia (#024069)

Registered Professional Engineer in Wyoming (#16222)

Certified Fire and Explosion Investigator (CFEI) National Association of Fire Investigators, International (NAFI # 20049-11449)

International Association of Arson Investigators (Member # 1309976; since 11/20/2014)

National Council of Examiners for Engineering and Surveying (NCEES # 58703)

PROFESSIONAL ORGANIZATIONS

Institute of Electrical and Electronics Engineers (IEEE)

Inter-National Electrical Testing Association (NETA)

Nation Fire Protection Association (NFPA)

CONTINUING EDUCATION

2022 Fire Investigation Team
Mathematical Modeling of Enclosure Fires
"Circuit Breakers - Different Breaker Types and Maintenance Requirements for Reliability"
Losses at Renewable Energy Installations
Construction Defects
Shortcomings of Low Voltage Testing for Motor Insulation Condition Assessment
Fire Dynamics Calculations
Code of Ethics for Engineers
Electric & Hybrid Vehicle Fires
2023 Ethics for Florida Engineers
An Introduction to Switchgear for Auxiliary Power Systems

2020 *Alternating Current Generators,* Failure & Damage Analysis, Inc
Arc Mapping Basics International Association of Arson Investigators (IAAI)
Charting Your Career Path in Fire Investigation, IAAI
Critical Evaluation and Testing of Commonly Reported, IAAI
Accidental Causes, IAAI
Explosion Dynamics, IAAI
Fire Chemistry, IAAI
Fire Flow Analysis, IAAI
Fire Investigator Scene Safety, IAAI
Investigating Motor Vehicle Fires, IAAI
Motor Vehicles: The Engine and the Ignition, Electrical, and Fuel Systems, IAAI
Motor Vehicles: Transmission, Exhaust, Brake, and Accessory Systems, IAAI
NFPA 1033 and Your Career, IAAI

Residential Electrical Systems, IAAI

Residential Natural Gas Systems, IAAI

The Scientific Method for Fire and Explosion Investigation, IAAI

Understanding Undetermined Fires, IAAI

2019 *Power Engineering Fundamentals*, SunCam, Inc.

2018 *Introduction to Cathodic Protection Final*, Process Engineering Consultants

Electrical Connection Failures, Engineering Design and Testing

Basic or Resistance Testing, Engineering Design and Testing

Current IEEE/ANSI MV Switchgear Design & Testing Standards, ABB

2017 *Alternating Current Generators,* Failure & Damage Analysis, Inc

Introduction to Batteries, Failure & Damage Analysis, Inc)

Personal Protective Equipment, Failure & Damage Analysis, Inc

Photovoltaic Power Systems, Course No. E297T, PDH Center

2016 *Electrical Testing - Understanding Power Factor Testing for Transformers, Bushings, and Bushings, and Breakers,* SD Myers

Half Century Transformers, SD Myers

2015 *Investigation of Gas and Electric Appliance Fires,* Fire Findings

International Fire, Arson & Explosion Investigation Training Program National, Association of Fire Investigators, International

2013 *Alcoa 32.60 Electrical High Voltage Maintenance and Design Safety Practices,* Alcoa Power Generating Inc.

2012 *Alcoa 32.60 Electrical High Voltage Maintenance and Design Safety Practices,* Alcoa Power Generating Inc.

2011 *NFPA 921 Fire and Explosion Investigations Seminar,* Certificate for Fire and Explosion Investigator

2010 *Arc Flash Lockout/Tagout Electrical Safety,* Life Safety Consultants

Fire Protection / Life Safety Qualifications, NFPA Certified Fire Inspector I (CFI) Training (Passing grade on written exam on NFPA 1, 101, 13, 25, 72)