

Summary

Luke Martin is a partner and leader in ScottMadden's energy practice. He advises utilities, generators, national laboratories, technology providers, and critical infrastructure organizations on operational technology, cybersecurity, NERC compliance, AI enablement, safety and training, commercial strategy, and digital transformation. Drawing on field, plant, and control center experience, he translates complex priorities into practical strategies, governance models, road maps, and implementation programs that improve performance, compliance, resilience, and workforce readiness. Luke holds an M.B.A. from Duke University's Fuqua School of Business and a B.S. in computer and electrical engineering from North Carolina State University.

Areas of Specialization

- Transmission and Distribution
- Generation
- Nuclear Generation
- Advanced Nuclear and SMR Strategy
- Operational Technology
- Safety and Operational Risk

Solutions and Capabilities

- Cybersecurity and NERC CIP
- Artificial Intelligence Enablement
- NXT GEN® Training
- Program and Project Management
- Risk and Compliance
- Plant Modernization and Digital Transformation

Selected Engagements

Operational Technology, NERC, Cybersecurity, and AI

- Supported a large nuclear generator with the implementation and operational integration of AI-enabled capabilities within its corrective action program. Work includes facilitating cross-functional workshops, capturing operational decision logic, integrating AI governance and processes, and establishing a scalable approach for future operational AI deployments.
- Supported the development and implementation of a NERC CIP compliance program across a large utility's fossil and hydro generation fleet, establishing consistent compliance expectations, strengthening control implementation, and improving fleetwide compliance readiness.
- Supported the development of OutageIQ, an AI-enabled outage planning tool designed to improve planning accuracy, reduce planner workload, and support fleetwide scaling. Work includes data mapping and structuring, integration of lessons learned, prototype execution for 7F combined-cycle outages, process improvement, planner training, and coordination with GE Vernova on data governance and complementary outage innovation opportunities.
- Supported the expansion of a renewable remote operations center (RROC) and its transition to a NERC CIP Medium Impact Control Center to accommodate continued growth in renewable and battery energy storage system (BESS) generation. Work includes assessing and implementing the cybersecurity, operations, governance, staffing, technology architecture, resilience, and compliance programs needed to make the expanded RROC operational, NERC compliant, and scalable.
- Developed a scalable NERC compliance program for an electric cooperative required to register because of significant load growth driven by data center development and AI-related demand in its service territory. Scope included regulatory engagement planning, registration and filing support, standards applicability, governance, policies, procedures, and integration of compliance requirements into capital project execution.

- Adapted NERC CIP standards and developed reliability compliance processes and training for an emerging reliability council and its implementation partners. Facilitated technical working groups with utility and industry stakeholders to align standards, violation severity levels, and compliance milestones, translating NERC CIP requirements into practical implementation guidance.
- Supported AI and digital assurance research for a national laboratory focused on critical energy infrastructure, including stakeholder engagement, methods development, and facilitation frameworks to strengthen reliability, resilience, and operational decision-making.
- Supported development of a Grid AI Deployment Framework for a national laboratory focused on critical energy infrastructure. The framework incorporated responsible AI principles, risk and consequence analysis, and data and business readiness criteria; work also included stakeholder facilitation and AI training to help utilities govern and deploy AI-enabled capabilities.
- Performed component-level data center supply chain risk analysis for a national laboratory and federal energy stakeholders across power, cooling, backup generation, grid infrastructure, and network-support systems. Developed supplier mapping and evaluated the reliability and criticality of UPS, PDUs, switchgear, transformers, HVAC and cooling equipment, and generators, including grid-impact and behind-the-meter generation considerations.
- Supported operational technology (OT) product development, strategy, governance, process improvement, and product planning for a technology provider serving utility, fiber, telecom, and infrastructure clients. Work included market analysis, competitive intelligence, implementation support, and operating model alignment.
- Established a new cybersecurity and OT security program for a large generation fleet. Used a risk-informed approach to identify applicable controls for generation assets, prepared OT security playbooks for critical stations, and developed an implementation road map that integrated requirements into work management.
- Supported a top U.S. utility's enterprise IT and OT initiative to improve cyber resilience, including evaluation of asset-identification tools and process mapping for transferring workloads to operational business units.
- Managed a NERC compliance assessment for a battery storage generation company. Identified physical security design changes prior to construction to secure BES cyber assets, reduce future control costs, and establish a scalable NERC compliance program road map.
- Led a cybersecurity and NERC CIP compliance program recovery effort for a large utility, improving technical documentation, workforce education, work management tools, dashboards, and reporting. The effort supported selected Operations and Planning standards and all NERC CIP standards, contributing to a clean NERC CIP audit.

Nuclear, Generation, and Advanced Nuclear Strategy

- Supported nuclear AI benchmarking and modernization research for a national laboratory, developing frameworks to connect AI applications, plant optimization, and capacity expansion strategies with practical utility adoption pathways.
- Developed business cases for AI-enabled nuclear engineering applications, assessing ROI, implementation requirements, and operational use cases to help generation organizations prioritize practical AI adoption opportunities.
- Supported nuclear capacity expansion strategy for a national laboratory by analyzing production and investment tax credits (PTCs and ITCs), clarifying nuclear safe harbor guidance, evaluating incentive options, and recommending milestone-based incentives and supply chain coordination programs to accelerate industry deployment.
- Developed commercial nuclear, small modular reactor (SMR), advanced nuclear, and national security nuclear market strategies for a technology provider, translating policy, market, customer, and technology signals into actionable opportunity areas and investment road maps.
- Supported commercial nuclear business development enablement and go-to-market execution, helping leadership prioritize target markets, define value propositions, identify partners and stakeholders, and align internal teams around practical growth opportunities.
- Partnered with a national laboratory to develop a comprehensive business case for plant-wide digital infrastructure modernization across safety-related and non-safety systems at a two-unit U.S. nuclear plant. Analyzed historical parts and labor costs to support a digital instrumentation and control capital investment of more than \$200 million.
- Supported the nuclear plant modernization program team at a leading research institute in developing business case analyses for emerging technologies that can reduce generation operating costs. Topics included drones, robotics, electronic work packages, risk-informed inspections, simulators, field monitoring, automated chemistry, improved training methods, and condition-based monitoring.

- Directed an engagement evaluating business process automation methods for generation work management and scheduling, including AI-enabled work request screening, assisted planning, and automated scheduling.
- Managed implementation of an \$8 million post-Fukushima capital project to enhance offsite radiological monitoring for the world's largest nuclear generator, including network design, monitor procurement, analytic engine software, regulatory approval support, staff training, RFP development, and capital project reporting.
- Led nuclear industry research with a leading national laboratory to identify priority plant-modernization work-reduction opportunities and the infrastructure and tools needed to move the U.S. nuclear fleet toward an integrated, remote-supported operating model.

Plant Modernization and Digital Transformation

- Co-led development of a plant modernization business case tool for an industry research organization, evaluating asset management initiatives such as IoT sensors, monitoring and diagnostics programs, thermal performance monitoring, cycle isolation, and condition-based maintenance.
- Managed research assessing the costs and benefits of monitoring and diagnostics programs using IoT sensors, including impacts on preventive maintenance, major component maintenance deferral, and avoided component failure costs at large U.S. nuclear plants.
- Supported integrated operations and fleet modernization scoping with a major generation utility and national laboratory, helping define process, technology, and organizational enablers for improved operating cost and performance.
- Identified commercially available software and tools to support digital transformation program objectives for a national laboratory research initiative, including advanced training technologies, automated planning and scheduling, drones and robotics, AI condition report analysis, and condition-based monitoring.
- Developed a common digital transformation framework with an energy research institute and stakeholders from generation, nuclear, transmission, and distribution utilities, establishing the basis for a cross-sector digital transformation member research initiative.
- Benchmarked fossil and nuclear utility operators against a global manufacturing leader to identify leading practices in digital innovation, IoT and process automation, analytics, and cybersecurity.
- Supported digital I&C, modernization value measurement, and new nuclear staffing research for an industry research organization, helping generation stakeholders evaluate modernization investments, staffing implications, and practical technology adoption pathways.

Safety and Training

- Conducted safety due diligence for a private equity acquisition of electrical contracting businesses, assessing safety program maturity, operating risks, and integration considerations to support transaction decision-making.
- Supported implementation of a transmission safety management system for a Middle Eastern electric utility, aligning enterprise standards, procedures, work methods, and training to improve field execution and safety governance.
- Led an assessment of transmission safety programs and procedures against global leading practices for a Middle Eastern electric utility. Performed field observations across four regional areas covering control room operations, substation maintenance, and field safety practices, with lessons learned used to update procedures and training.
- Developed procedure and training materials for transmission operations and maintenance activities, helping standardize work practices, strengthen workforce readiness, and support sustained implementation of safety program improvements.
- Developed integrated, end-to-end switching and tagging programs and procedures for a large transmission organization and prepared role-based NXT GEN® video-based training to support implementation.
- Implemented a safety management system for a large, vertically integrated electric utility, partnering with the transmission business unit to align enterprise standards with procedures and work methods.
- Supported safety and training modernization for an electrical service provider following a serious field safety incident during storm response. Conducted field assessments and operator interviews to evaluate safety behaviors, identify causal factors, and develop recommendations to strengthen safety practices across crews, supervisors, safety observers, and trainers.
- Developed field-informed NXT GEN® training content and safety program improvements based on assessment findings, including visual digital safety manual updates, just-in-time learning modules, a

comprehensive pre-job brief focused on critical hazards and mitigation strategies, and improved training completion tracking. Work contributed to the company's best recorded safety performance within 13 months of the assessment.

- Developed LOTO training using ScottMadden's NXT GEN® approach, translating procedure requirements into role-based training to improve worker understanding, consistency, and field execution.
- Led a safety-focused audit of electrical power factor testing performed by transmission and generation crews for a large U.S. utility, reporting results from more than 25 field visits to executive management.