PAVAN KUMAR PENKEY

MSEE, SMIEEE

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PROFESSIONAL SUMMARY

Accomplished Power System Protection Engineer with experience designing, developing, and commissioning LV, MV, and HV protection schemes for hyperscale data center, offshore wind substation, industrial, utility, and oil and gas, applications. Meticulously detail-oriented and organized, with strong interpersonal skills and experience leading large budget projects and supervising diverse teams. Highly motivated to make the grid of the future resilient and secure.

EDUCATION

Ph.D. in Electrical Engineering (Part time)	University of Idaho, US	Ongoing
Master of Science in Electrical Engineering	University of Idaho, US	Aug 2016
Academic Certificate in Power System Protection & Relaying	University of Idaho, US	May 2016
B.E. Electrical and Electronics Engineering	Andhra University, India	May 2011

SKILLS

- Protection design
- Power system studies
- Industrial protection
- Utility applications
- Microgrid applications
- Offshore applications
- IBR Integration Studies
- Arc Flash Protection/Studies
- SEL Relays proficiency
- SEL Software Suite
- Omicron Test Universe
- Doble Protection Suite
- ASPEN OneLiner™
- SKM Power* Tools®
- PowerWorld®
- DIGSI 5
- ETAP®
- PTC Mathcad®
- RSCAD®
- MATLAB®

EXPERTISE

- **Project Management and Supervision** Lead multiple protection emphasized projects within time, budget, & quality.
- **Electrical Engineering Design** Designed and developed protection schemes for substations, retrofit designs.
- **Power system modeling and analysis** Modeled and developed various HIL simulations, performed system studies.
- **Protection and Control applications** Developed variety of protection settings and implemented control schemes.
- **Commissioning, Field work and Travel** Commissioned and tested various solutions by spending 1.5 years in travel.

EXPERIENCE

Lead Protection and Control Engineer, GSI, Grid Solutions, GE Vernova, Pullman, WA Feb 2023 – Present

Offshore Wind HVDC/HVAC Interconnection Projects

- Lead the onshore P&C scope for the 345kV AC interconnection cable feeder of South Coast Wind project.
- Developed the key design documents including HV Protection Single Line Diagrams (PSLD), Functional design specification (FDS), Trip/interlocking diagrams and CT/CVT selection criteria.
- Collaborated with the HVDC team and utility stakeholders to execute the project, ensuring seamless interface between HVDC schemes and AC protection systems while developing reference solutions.
- Contributed to the conceptual study and detailed design of onshore and offshore substations for the Empire Wind Project. Delivered key design documents including HV/MV PSLD, AC/DC schematics, Bill of Materials, load lists, trip/interlocking diagrams, ensuring compliance with safety and quality standards.
- Validated SCADA architecture, Protection Philosophy FDS documents, and CT/PT calculations. Conducted high-level protection coordination reviews, including cable schedules and Clause-by-Clause analysis of specifications.

Data Center HV Substation Projects

- Spearheaded the HV Utility interconnection secondary project for the Amazon data center from inception to completion, handling scoping, protection philosophy development, and station control design.
- Lead the development of the entire secondary design package, including PSLDs, 3LDs, auxiliary power design, panel design, AC/DC schematics, wiring, cable schedules, interlocking/trip logic diagrams, and network architecture.
- Validated protection studies such as short circuit, coordination, CT/PT selection, power factor, harmonic, arc flash, flicker, insulation coordination, and TRV. Led RTDS HIL testing, identifying, and implementing improvements.
- Performed DC battery and charger sizing, LV cable voltage drop calculations, and AC auxiliary power design.
- Coordinated with stakeholders, suppliers, and internal teams to deliver solutions that met technical requirements, reviewing all supplier documentation for compliance.
- Validated test documentation by collaborating with relay settings engineers, site managers, commissioning engineers.

- Worked closely with the project engineering manager to proactively resolve issues, and forecasted resources and materials, assigning tasks per the project execution plan.
- Serve as the subject-matter expert (SME) for protection and control, developing innovative source-transfer schemes for future data center mega campuses and review of multiple different site design documentation.
- Partner with commissioning teams to troubleshoot protection events, perform root-cause analysis, and implement corrective actions to prevent recurrence.

Other Projects

- Lead the secondary electrical scope of the supplying the substation equipment to the mega data center campuses being built by Chevron.
- Supporting the TRV/TOV study requirements to validate circuit breakers for this large substation.
- Validated the protection schemes developed for a Synchronous condenser integration with the grid.

Project Engineer – Protection Supervisor, SEL Engineering Services, Pullman, Washington, US 2015 – 2023

May 2015 Internship Aug 2016 Associate Aug 2018 Engineer – I Aug 2020 Engineer – II May 2021 Supervisor

Engineering Supervision

- Promoted to manage a cross-functional team and effectively drive projects from design to commissioning.
- Lead a diverse team as a technical lead to develop protection schemes for mission critical facilities.
- Solved technical problems while documenting the resolutions and laid out strategic plans to avoid reoccurrence.
- Mentored five new engineers and developed training plans by conducting technical sessions regularly.

Data Center protection applications

- Developed protection schemes for new architecture in Google data center protection with the integration of IBR.
- Drafted protection philosophy for Google IBR data center protection including RMUs and specified relays.
- Developed an HIL simulation model of Google data center facility in RTDS to perform extensive testing of protection and control schemes using Siemens relays and proposed new methods for IBR integration.
- Tested and validated the protection schemes and response of Inverter controls in Data center model.

Utility protection applications

- Designed the protection schemes for substation equipment upgrades, system retrofit design applications for Utilities, including the development of drawings and protection settings for transformers, bus upgrades, and line upgrades.
- Developed design and setting standards for thermal monitoring of large Utility transformers.
- Prepared detailed design specifications for LV, MV, and HV systems including drawings for AC/DC schematics, single line/three-line drawings, logic diagrams, wiring drawings, panel arrangement, cable schedules, and BOMs.
- Developed and tested protection settings with HIL simulation model for 345kV series compensated lines with IBR sources, which includes shunt reactor protection, MV shunt capacitor control, and transformer thermal monitoring
- Modeled and maintained the power system for Utilities and Industrial customers and performed short circuit studies to calculate the settings of protection relays using simulation tools.

Oil and Gas protection applications

- Appointed as subject matter expert for protection scope on TCO project and received numerous accolades.
- Designed and developed relay protection logic, settings, schematics, functional design specifications for feeder, transformer, motor, generator, line, and bus differential protection schemes.
- Implemented IEC 61850 based transfer schemes and arc flash protection schemes for LV and MV switchgear.
- Performed CT saturation calculations and developed a CT selection criterion for a variety of power system equipment.
- Managed large-scale greenfield installations of several MV and LV substations while testing at switchgear manufacturer facilities and integration yards of Schneider, ABB, Siemens, GE Alstom in France, Italy, and Indonesia.
- Validated protection functions in SEL-751, SEL-710, SEL-751A, SEL-787, SEL-700G, SEL-735, SEL-311L, SEL-2411, SEL-587Z, SEL-849, SEL-411L, SEL-487B, SEL-487E, SEL-T401L, SEL-451 relays and more.
- Collaborated with cross-domain teams to execute projects with SCADA, networking, and load shedding systems.
- Resolved site issues by identifying root cause and provided solutions by replicating the issues in office.
- Performed short-circuit, time-current coordination, and arc flash studies on new and existing LV and MV switchgear.
- Created automated settings development process to avoid manual development task on hundreds of LV MCCs.
- Simplified management of a large volume of relay installations by developing new tools, processes, and systems.

Research/Teaching Assistant, University of Idaho, Moscow, ID, US Aug 2014-Aug 2016

- Performed a feasibility study of establishing a microgrid in the city of Spokane with hydro generation as main source.
- Study involves microgrid modeling in Powerworld along with capacitor and battery sizing with placement.
- Taught about fifty junior level students in Electrical Circuits lab for two semesters and graded the course.

Systems Engineer, Tata Consultancy Services, Chennai, India July 2011–July 2014

- Developed store integration software using webMethods for various stores of Woolworths client in Australia.
- Managed Nokia Middleware for coordination between different applications and supply chain system in Finland.

PUBLICATIONS

- P. Penkey, N. Gaul, B. K. Johnson, and H. L. Hess, "Sizing and location identification for an electrical energy storage system in a renewable microgrid," 2016 IEEE Conference on Technologies for Sustainability (SusTech), 2016, pp. 83-88, doi: 10.1109/SusTech.2016.7897147.
- P. Penkey, H. Samkari, B. K. Johnson and H. L. Hess, "Voltage control by using capacitor banks and tap changing transformers in a renewable microgrid," 2017 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT), 2017, pp. 1-5, doi: 10.1109/ISGT.2017.8086063.
- P. Penkey, M. Alla, B. K. Johnson and T. R. McJunkin, "Improving transmission system resilience using an automation controller and Distributed Resources," 2016 Resilience Week (RWS), Chicago, IL, USA, 2016, pp. 89-94, doi: 10.1109/RWEEK.2016.7573313.
- P. Penkey, F. Alhajeri and B. K. Johnson, "Modeling, analysis and detection of faults in grid-connected PV systems," 2016 10th International Conference on Intelligent Systems and Control (ISCO), Coimbatore, India, 2016, pp. 1-5, doi: 10.1109/ISCO.2016.7727038.
- P. Penkey, Critical Load Serving Capability by Microgrid Operation, University of Idaho ProQuest Dissertations & Thesis, 2016.10149266.
- P. Penkey, A. Mohammad, N. Gaul, B. K. Johnson and H. L. Hess, "Analysis of solar estimation from buildings along with demand response in a renewable microgrid," 2016 First International Conference on Sustainable Green Buildings and Communities (SGBC), Chennai, India, 2016, pp. 1-5, doi: 10.1109/SGBC.2016.7936062.
- N. R. Powell, P. Penkey and B. K. Johnson, "Investigation of Improving High Voltage Transmission Rotor Angle and Voltage Stability with Distributed Generation Resources," 2016 IEEE Power and Energy Society General Meeting (PESGM), Boston, MA, USA, 2016, pp. 1-5, doi: 10.1109/PESGM.2016.7741888.
- R. Gnaedinger P. Penkey, N. Gaul, M. Phillips, B.K. Johnson, H.L. Hess, E. Lee, T. Rolstad, "Critical Load Serving Capability by Microgrid using 100% Renewable Energy," 2016 CIGRE US National Committee Grid of the Future Symposium, CIGRE USNC.

HONORS AND AWARDS

- Outstanding service and leadership to IEEE Award, IEEE Palouse section 2025
- Customer Excellence Award, GE Vernova Engineering & Technology Awards 2024
- Expert certification under Technical Expert Program of GE Vernova 2024
- IEEE Senior member Award 2022
- Distinguished service Award, IEEE Palouse section 2020
- Outstanding Graduate Student Award, GPSA, University of Idaho 2016
- Student achievement award and Scholarship, University of Idaho 2015
- Technical Research Exhibition, first place at NSBE Fall regional conference, San Francisco 2015

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Professional Society Affiliations

- Senior Member, Institute of Electrical and Electronics Engineers (IEEE).
- Member, IEEE Power & Energy Society (PES).
- Member, IEEE Industry Applications Society (IAS).
- Member, IEEE Power Electronics Society (PELS).

Peer Review and Judging

- Judge, Washington State University Computer Science Capstone Poster Competition (2023–present).
- Reviewer, IEEE PES General Meeting 2024 conference (papers: 24PESGM1587, 24PESGM1347).
- Reviewer, IEEE Transactions on Power Delivery Journal.
- Reviewer, IEEE Transactions on Power Systems Journal.
- Reviewer, IEEE TPEC 2026 conference.

Working Group Involvement

- IEEE PES Working Group 15.05.08 HVDC & FACTS Economics and Operating Strategies.
- IEEE PES Working Group for HVDC Digital Twin.

- C52: Revise IEEE Std C37.246-2017. IEEE Guide for Protection systems of Transmission to Generation Interconnections.
- C54: Data Center Protection, Automation, and Control (PAC) Systems.
- IEEE SA: Data centers: Standards Needs Analysis and Recommendations.

Service to Professional Society

- Section Chair, IEEE Palouse Section (approx. 300 members) (2022–present); Treasurer (2016–2022).
- Professional Chapter Representative, IEEE Region 6, IEEE Power & Energy Society (2023–present).
- IEEE PES Day Regional Lead (Region 6), IEEE PES Young Professionals (2025).
- Chair, Professional and Educational Activities Subcommittee, IEEE PES Young Professionals (2023–2024).
- Mentor, IEEE PES Young Professionals Mentoring Program; supported early-career engineers from multiple countries.
- Collaborated with several IEEE distinguished lecturers and IEEE Fellows in organizing several technical events and workshops in the region and local IEEE Palouse section.

Presentations and Outreach

- Session Chair, "Resilient Control Architectures for Power Systems," IEEE PES General Meeting 2024; featuring Scott Manson, Craig Rieger, Brian Johnson, Vivek Singh, and Mike Diedesch.
- Presenter, SASE Stem connect 2025: "Creating Your Elevator Speech and Personal Branding" workshop.
- Invited Speaker, Panel "Powering the Digital Future: Innovation, Infrastructure, and Impact," AKPESSC 2025, IEEE PES Kerala Chapter.
- Invited Speaker, IEEE PES Kerala Chapter Industry-Expert Interaction (Enlighten) 2023 Series: "Protection Fault Analysis Methods Using Symmetrical Components".
- Organizer and presenter, IEEE PES Young Professionals global, hands-on "Grid Game" event (2023).
- Invited Speaker, Workshop "Resilient Control Architectures and Power Systems," demonstrating Grid Game benefits and uses, University of North Dakota.

Certifications

- Oracle Certified Professional, Java SE 6 Programmer (2013).
- Programming in HTML5 with JavaScript and CSS3 Specialist (2013).

REFERENCES

- Dr. Brian K Johnson, University Distinguished Professor, SEL Endowed chair , University of Idaho.
- Dr. Craig Rieger, MD of TRECS Consulting, retd Directorate Fellow, Idaho National Laboratory.
- John D McDonald, MD of JDM Associates, retd Smart grid business development leader, GE Vernova.
- Scott Manson, Fellow Engineer, Schweitzer Engineering Laboratories, Inc.
- Dr. Anamika Dubey, Associate Professor, Huie-Rogers Endowed chair, Washington State University.