



## JOB DESCRIPTION

Job Title: Protection and Systems Engineer Position Number: 95-31

Incumbent: Vacant Effective Date: October 2025

Employment Status: Permanent Bargaining Unit: Yes  No

Supervisor's Title: Manager, Electrical Engineering Department: Engineering & Capital Projects

**Subordinate Positions:** May provide technical leadership, project oversight, and supervision to trades staff, engineering technologists, engineers, EITs, and external contractors or consultants during design, construction, commissioning, and maintenance activities.

### SUMMARY

Under the direction of the Manager, Electrical Engineering, the Protection and Systems Engineer provides specialized engineering, operations, and maintenance (O&M) support for Yukon Energy's protection, control, and monitoring systems across its generation, transmission, and distribution network.

The incumbent ensures safe, reliable, and secure system operation through the design, implementation, testing, and continuous improvement of protective relaying and control systems. Responsibilities include performing relay setting calculations, developing setting files and protection narratives, conducting coordination and fault studies, analyzing system events, and implementing corrective measures to maintain and enhance system reliability.

The position also supports capital projects, ensuring that new facilities, upgrades, and modifications meet industry standards and are seamlessly integrated with existing protection and control infrastructure.

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#### 1. Protection and Control Engineering

- Develop, implement, and maintain protection philosophies, relay settings, and control logic for generation, transmission, and distribution systems.
- Perform and/or support short-circuit, coordination, and arc-flash studies using software such as ASPEN, ETAP, CYME, and PSS/E.
- Design, configure, and test protective relay schemes for transformers, lines, generators, feeders and buses, including pilot and differential schemes.
- Review and approve new settings, setting changes, ensuring system security, selectivity, and compliance with IEEE, CSA, and utility standards.
- Maintain and update protection settings databases, test records, and logic documentation.

#### 2. Operations and Maintenance Support

- Provide engineering support to field crews, operations staff, and maintenance teams for troubleshooting, testing, and repair of protection and control systems.
- Assist in developing and maintaining standardized maintenance procedures, relay test plans, and calibration intervals for protective relays, RTUs, and control systems.
- Maintain and update relay setting files, test records, and configuration documentation to ensure they remain current, accurate, and auditable.

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- Support field teams in identifying issues observed during maintenance or equipment failure events and assist in implementing corrective actions as directed.

### **3. System Reliability, Root-Cause Analysis, and Outage Investigations**

- Lead and support system disturbance and outage investigations to determine the sequence of events, equipment performance, and protection system response.
- Perform detailed root-cause analyses (RCA) of protection misoperations, equipment failures, and control system anomalies using relay event records, digital fault data, SCADA logs, etc.
- Prepare formal outage and RCA reports summarizing findings, contributing factors, and recommended corrective and preventive measures.
- Coordinate with Operations, Maintenance, and Engineering teams to implement and verify corrective actions and ensure long-term system reliability improvements.
- Provide technical feedback from investigations to inform design standards, operating procedures, and capital project requirements, ensuring lessons learned are embedded in future work and ongoing operation.

### **4. Capital Project and Commissioning Support**

- Provide protection and control design input through all project phases — concept, detailed design, construction, commissioning, and closeout.
- Review vendor drawings, calculations, protection schemes, and communication architectures for compliance with YEC standards.
- Participate in Factory Acceptance Tests (FATs), Site Acceptance Tests (SATs), and commissioning activities in both greenfield and brownfield environments, ensuring proper integration with existing systems and infrastructure.
- Support energization of substations, generating units, and control systems by verifying protection schemes, interlocking, and control logic functionality.
- Coordinate with consultants and contractors to ensure quality assurance, as-built accuracy, and seamless integration of new systems.
- Support the integration of new protection and control systems into existing SCADA, EMS, and communications networks.

### **5. Documentation, Standards, and Continuous Improvement**

- Develop and maintain protection standards, coordination studies, test procedures, and commissioning templates.
- Contribute to the development of YEC engineering procedures for O&M and system reliability.
- Prepare technical reports, memoranda, and recommendations for management and regulatory submissions.
- Stay current with IEEE/CSA standards and emerging technologies in protection, automation, and grid modernization to guide utility practice improvements.

### **6. Collaboration and Leadership**

- Provide technical guidance and mentorship to engineers, engineering technologists, field technicians, and contractors.
- Collaborate with Operations, Maintenance, and System Control staff to plan and execute outages, switching operations, and system upgrades.
- Participate in safety meetings, incident reviews, and continuous improvement initiatives to enhance operational reliability and safety.

- Build effective working relationships with internal departments, consultants, and partner utilities.

### 7. Other related duties

## QUALIFICATIONS, SKILLS, AND EXPERIENCE

### 1. Education and Registration

- Bachelor's degree in electrical engineering (Power Systems focus preferred).
- Eligible for registration as a Professional Engineer (P.Eng.) in the Yukon.
- *Alternatively:* Diploma in Electrical Engineering Technology with a minimum of eight (8) years of relevant utility experience, and eligible for or holding a Limited License (L.L.Eng.) to practice in Yukon or another Canadian jurisdiction, or a demonstrated ability to obtain such a license in Yukon.

### 2. Experience

- Minimum five (5) years of progressive utility experience in protection and control for generation, transmission, and/or distribution systems.
- Demonstrated experience providing O&M support, including relay testing, troubleshooting, and field commissioning.
- Proven ability to conduct outage investigations and root-cause analyses for protection and system events.
- Experience with capital project execution, including design review, equipment procurement, and commissioning.
- Familiarity with control, SCADA, and communication systems (DNP3, IEC 61850, Modbus, Ethernet, SEL Mirrored bits and fiber-optic networks).
- Working knowledge of relevant IEEE, CSA, and NETA standards governing protection systems, testing, and maintenance.

### 3. Technical Skills

- Proficiency in ASPEN OneLiner, ETAP, CYME, or PSS/E for system analysis.
- Experience using SEL AcSELerator QuickSet, Synchrowave Events and Real Time Automation Controller (RTAC), and related device configuration tools.
- Strong understanding of generator, transformer, bus, and line protection principles, including differential and pilot schemes.
- Demonstrated commissioning experience in both greenfield and brownfield environments, including integration of new systems with existing infrastructure, relay logic validation, and functional verification of protection schemes prior to energization.
- Knowledge of DER integration and interconnection standards (IEEE 1547, IEEE 1547.1, UL 1741 SA & SB).

### 4. Other Skills

- Strong analytical and problem-solving abilities, particularly under operational pressure.
- Excellent technical writing and reporting skills for internal and regulatory audiences.
- Effective communication and collaboration within multidisciplinary and field-based environments.
- Ability to manage multiple small projects and priorities within operational constraints.
- Valid Class 5 driver's license and ability to travel to remote sites (10–25%).



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### WORKING CONDITIONS

- Work is primarily performed in an office environment, with periodic fieldwork at substations, generating stations, and other utility sites.
- Field assignments may involve exposure to outdoor weather conditions, including extreme cold, heat, and noise.
- Must maintain the confidentiality of corporate and operational information at all times.
- Required to adhere to all corporate safety, environmental, and administrative policies, procedures, and guidelines.
- Travel within Yukon (10–25%) is required to support project, maintenance, and commissioning activities in remote locations.