



HAROLD HARKONEN, P. ENG

PRINCIPAL, SENIOR E & C ENGINEER

EXPERIENCE

Mr. Harkonen is a company Principal and Senior Electrical and Control Engineer. He has a broad range of experience in the specification, design, and commissioning of electrical power and control systems. He has specialized experience in the application and configuration of digital protective relays and high voltage substation design.

Core competencies include:

- Project engineering and management.
- Detailed electrical power and control system design.
- Power system commissioning.
- Power system evaluations and troubleshooting.

The following is representative of Mr. Harkonen's experience:

- Power system evaluation for remote gold mining and processing site in order to determine best alternatives for proposed site electrical load increases.
- Customer liaison to IESO regarding application for mine site load increase and review of proposed alternatives measures for voltage support.
- Detailed digital relay logic/configuration and switchyard ground grid design for 112 MW windfarm including 34.5 kV collector circuit breakers, 34.5/240 kV step up transformer, 240 kV tie-line, and 240 kV tie substation.
- Project manager for 115 kV switchyard modernization projects including installation of new 115/12.5 kV step down transformers, 115 kV SF6 circuit breakers, air break switches, 115 kV buswork, and ground grid design. Included direction of electrical, structural, and civil disciplines.
- Product development for hydraulic turbine generator protection and control systems for small waterpower installations.
- Detailed 115 kV ground grid evaluation and analysis for existing industrial substation including subsequent step and touch potential hazard mitigation design work.
- Detailed electrical design for 115 kV / 4160 volt substation transformer protective relaying installations.
- Industrial power distribution arc flash hazard analysis and mitigation design utilizing NFPA 70E and IEEE1584 standards.
- Project manager for upgrade of a 15 MW GE turbine control system from Mark II to Mark V series controls. Also included installation of a remote monitoring and control system at the powerhouse control room.
- Lead electrical project engineer for the installation of a 20 MW steam turbine

generator. Included the upgrade of the 125 kV incoming and mill 13.8 kV protective relaying systems. Also included liaison with the utility to ensure a reliable and safe system interconnection.

- Detailed audit of industrial electrical power distribution system from 115 kV incoming to 600 V distribution to evaluate potential reliability issues and develop 5-year maintenance and capital improvement plan.
- Detailed electrical design to modernize the protective relaying for a 115/13.8 kV distribution system including the incoming utility supply connection and plant generation.
- Detailed electrical design for the replacement of a 13.2 kV, 3000 KVA unit substation, motor control centres, and effluent aeration system. Included project management of other engineering disciplines and trades.

PROFESSIONAL AFFILIATIONS

- Association of Professional Engineers of Ontario (1991)
- Association of Professional Engineers, Geologists and Geophysicists of Alberta (2005)
- Association of Professional Engineers and Geoscientists of British Columbia (2008)
- State of Minnesota Professional Engineer (2003)
- State of Wisconsin Professional Engineer (2004)
- NCEES Record Verification (2004)
- Institute of Electrical and Electronic Engineers – Senior Member (1989)
- Instrumentation, Systems, and Automation Society (1998)
- Pulp And Paper Technical Association of Canada (2002)

EDUCATION

1989	Lakehead University	Thunder Bay, ON
	■ Bachelor of Engineering (Electrical)	

1987	Lakehead University	Thunder Bay, ON
	■ Electrical Engineering Technologist	

EMPLOYMENT HISTORY

1999-Present	KMH Engineering Inc.	Thunder Bay, ON
	■ Principal, Senior Electrical & Control Engineer	

1998-1999	MVS Engineering Inc.	Thunder Bay, ON
	■ Senior Electrical & Control Engineer	

1997-1998	Champion International Inc.	Canton, NC
	■ Electrical and Instrumentation Maintenance Engineer	

1995-1997	Kimberly-Clark Inc.	Coosa Pines, AL
■	Electrical and Instrumentation Project Engineer	
1989-1995	Kimberly-Clark Inc.	Terrace Bay, ON
■	Electrical Maintenance and Project Engineer	