Q. **Asset Management**

Describe the duties and responsibilities of Hydro's Protection and Control (P&C) engineers and P&C technologists.

A. **Protection and Control (P&C) Engineer**

The P&C Engineer specializes in the area of power utility design and provides project management and technical support within the asset management function.

From a project management perspective, the P&C Engineer is responsible for all aspects of the engineering design from the conceptual stage to final feasibility. The P&C Engineer is also responsible for the project budget, work preparation, design procurement, contract preparation, as well as inspection and testing of equipment and systems. Specifically, duties include identifying and developing design standards and procedures; evaluating and making recommendations on procurement requirements including awarding of contracts specific to the project. The P&C Engineer provides engineering support during construction and commissioning phases of projects and may also direct other employees and external contractors in the installation of certain equipment and systems.

From a technical service support perspective, the P&C Engineer provides support to field operations on a daily basis including detailed analysis of operating systems and maintenance problems (conditions). This includes reviewing system events and outages and providing technical support on findings; carrying out protection coordination reviews (studies) for generator, transmission and distribution line settings; and preparing settings for relays used in generation facilities (i.e., hydro,

thermal, gas turbine, diesel), terminal stations, and/or transmission lines and distribution systems.

P&C Engineers also ensure continuity and knowledge transfer of technical expertise through design standards and by providing support through mentoring and coaching other technical service employees (such as P&C Technologists and junior engineers).

Protection and Controls (P&C) Technologist

P&C Technologists progress through a four-year step progression program before obtaining their full Technologist status with Hydro. The P&C Technologist performs a variety of duties which include installing, testing, maintaining and modifying protective relays, meters (including revenue metering monthly checks), and instrumentation and control equipment associated with the provincial power grid, distribution systems and generating systems. The P&C Technologist also performs other tests that relate to the primary equipment insulation integrity such as power factor and dielectric tests. They are also required to maintain and keep historical test records for primary equipment, which they will use to compare and evaluate equipment performance.

The P&C Technologist can also be involved in the commissioning of major system components, which includes troubleshooting and the testing of system components along with protection and control schemes. They also prepare drawings, material lists and cost estimates for new and modified installations and are responsible for preparing and maintaining system and equipment drawings.

Throughout the performance of the above duties, P&C Technologists are responsible to ensure their personal safety and the safety of others through the

promotion of the corporate safety and health program as well as ensuring that environmental aspects of the duties and responsibilities are considered.

Table 1 below provides a summary of the key competencies and key technical skills required for the P&C Technologist.

Table 1

KEY COMPETENCY	KEY TECHNICAL SKILLS
Relaying	Installs protective relaying
	Tests protective relaying
	Performs maintenance on protective relaying
	Performs modifications on protective relaying
Metering	Installs metering
	Tests protective metering
	Performs maintenance on metering
	Performs modifications on metering
Instrumentations and Control Equipment	Installs instrumentation and control equipment
	Tests instrumentation and control equipment
	Performs maintenance on instrumentation and control equipment
	Performs modifications on instrumentation and control equipment
Major System Components	Commissioning
	Troubleshooting
	Testing
Installations	Prepares drawings
	Prepares material lists
	Prepares cost estimates
System and Equipment Drawings	Prepares system and equipment drawings
	Maintains system and equipment drawings
	Updates system and equipment drawings
	Retains records
Performs Safety Related Functions	Maintains safe work environment
	Uses PPE and safety equipment
Performs Environmentally Conscious Related Function	Maintains safe work environment