The Evolution of Electrical Inspection in Ontario

An Historical Perspective 1892 - 1993

Surprisingly, few people realize that Ontario Hydro has assumed a measure of responsibility for the effect that electrical equipment has on the safety of the power users and people of Ontario. This evolution of service over the past century has created an environment with so many subtle controls in place that a relatively safe environment exists for the people of Ontario. This is the story of what Ontario Hydro Electrical Inspection (OHEI) has done in their efforts to keep Ontario safe.

How It Began

By 1890 steam driven generators made it possible for the majority of Ontario villages with over 3,000 residents to have access to electric streetlights. It was only a year or two after the Toronto Incandescent Electric Light Company was established that electrical safety first became an issue in Canada. The initiative came from the Canadian Fire Underwriters Association. Concerned about the massive financial liabilities its members could face from structural fires caused by improper wiring, the Association appointed an inspector in 1892 to ensure that all new electric services and equipment were installed in accordance with its own requirements.

A. Bruce Smith, then superintendent of construction for the G.N.W. Telegraph Company, was the first person charged with the onerous task of enforcing the new electric code.

The new power source had caught the fancy of consumers and nowhere was this more evident than in the City of Toronto, where scores of contractors and builders came forward to meet the demand with inferior, often bogus, and clearly dangerous workmanship. It was not unusual to have wires installed in new structures that literally went nowhere. Meters were easily tampered with. And, when Toronto Hydro was formed, it was often in a dangerous race with Toronto Electric Light Co. to see which one could install services first. The chief form of protection in most wiring installations of the time was a good daubing with P & B Compound, commonly known as “stink”. As long as the wireman applied lots of P & B on the cutout box and covered up anything that did not look right electrically, it was generally considered a very good job!

To offset growing concerns, significant amendments were made to the Power Commission Act in 1912 and 1914 to accommodate the appointment of inspectors in Municipalities to ensure that electrical equipment was safe. Inconsistencies that arose between Municipalities led to the amendment of the Power Commission Act in 1914 to allow Ontario Hydro, a provincial entity, to appoint electrical inspectors in Municipalities. As a result of confusion between Ontario Hydro appointed and Municipal inspectors changes to the Act in 1915 made Ontario Hydro responsible for all inspections in Ontario, and gave them the legal power to make regulations, appoint inspectors and prescribe fees.
The 1913 edition of the Hydro Electric Power Commissions Rules and Regulations focused on protecting the public from electrical fires. “The motive of the Underwriters’ Regulations has always been the protection of buildings against fire,” wrote H. F. Strickland, chief electric inspector for the Hydro Electric Power Commission in 1918. “...they did not pretend to make regulations for the protection of life.” Those regulations would come later.

Regardless of the motive, the decision by the Association to introduce Canada’s first electrical code has impacted the profitability of corporations and the personal safety of Ontario’s citizens for close to a century. It was a business decision that set into motion a system of safety inspection that would continuously improve over time and still prevails today.

Introducing Electrical Inspection at Ontario Hydro

Electrical inspection became a provincial responsibility to be delivered through Ontario Hydro. Ontario Hydro was given the legal power to make regulations, appoint inspectors and prescribe fees. Hydro was given significant authority to enforce its regulations: It was allowed to cut off power to those who were in violation of the regulations; inspectors were granted the right to enter any premises for inspection and were freed of liabilities; and penalties were introduced. The Province was divided into inspection districts supported by administration offices in strategic locations to best meet the needs of the province.

‘Hydro Approved’

In 1918, the Commission’s Approval Laboratory was established to test electrical equipment to determine its adherence to specific and stringent guidelines. The “Approval Laboratory” Department was operated by Ontario Hydro and resulted in the establishment of Rules and Regulations for testing and approving electrical materials, devices, and fittings. Products that met the guidelines were declared ‘Hydro Approved’, an endorsement that brought with it general acceptance by the electrical industry. The purpose of this function was to provide a standard for the design and construction of electrical materials to avoid risk of injury or fire to persons or property. This approval process was considered so significant that by 1924 the Commission was empowered to prohibit the sale of electrical equipment considered to be unsafe for public use. As a result, the Approvals Section of the Electrical Inspection Department was established.

Soon Ontario Hydro was testing products for all of Canada. When other provinces requested use of the “Hydro Approved” designation, and took steps to include it in their legislation, the need for a national testing body became evident. In 1940, the Canadian Standards Association Testing Laboratories were inaugurated and a decade later became a self-contained, self-supporting unit. Today, virtually all electrical equipment is submitted to accredited certification organizations (e.g. CSA, UL and others) for approval. However,
Ontario Hydro retained its position as the ultimate safety authority in Ontario regulation, and retained responsibility for conducting special inspections of unapproved electrical equipment, to define recognized certification agencies for electrical products in Ontario, and continues to respond to issues surrounding unapproved electrical products.

**Canadian Electrical Code Established**

Regulations kept pace with developments in the industry with appropriate amendments put forth by a committee comprised of representatives from manufacturers, contractors, the Toronto Hydro-Electric System and the Hydro Electric Power Commission. This system worked well until 1927, when due to an increasing lack of uniformity between the various Provinces over the regulations and their interpretation, a National Code Committee was established under the auspices of the Canadian Standards Association.

The work of the National Code Committee resulted in the introduction of the first Canadian Electrical Code called the Canadian Electrical Code Part I, which was adopted by the Commission as the regulatory foundation for the electrical inspection service in Ontario. Undertaken as a national collaborative effort, the Code was, and is to this day, recognized as representing the combined judgment of the best available talent in the field of electrical wiring installations. It was adopted by Ontario, Quebec, British Columbia, Nova Scotia and Saskatchewan.

In 1944 the Canadian Electric Code was adapted to meet the Ontario government’s Regulations Act and subsequent revisions have been made as required. Today the Code stands as the base for the formal wiring regulation for the Province of Ontario.

**Ontario’s Electrical Inspection Provisions**

The legal powers granted to Ontario Hydro in 1914 supported the introduction of regulations, the appointment of inspectors, and the prescription of fees for inspection services have been sustained over time and restructuring.

**Phase I: 1945-1980 Centralizing Inspection Policy**

In 1947, the Commission began to decentralize its administration by establishing regional offices. The preparation and interpretation of regulations, matters of policy and the application of rules were established as the responsibility of the inspection group in Head Office. The actual day-to-day work of supervising these regulations was placed in the Regions. Work groups were established throughout Ontario, with primary responsibility for inspection, supervision and policing the sale of equipment and apparatus, and gathering information for, and advancing prosecutions of, regulatory violations.

Over the years Ontario Hydro continued to focus on ensuring geographic dispersion of inspection services. Local offices supported by a provincial function responsible for...
business administration and systems, regulatory development, and policy implementation allowed local inspectors to focus on identifying inspection requirements, responding to customer needs, and reinforced the integration of the Electrical Inspection function into local communities across Ontario.

The close working relationship between electrical inspectors and the contractor community, local utilities, as well as public service personnel, supported increases in public electrical safety through cooperation between those who directly influence public safety and those who are governing electrical safety.

These relationships have supported the definition and modification of provincial regulations as they pertain not only to electrical inspection but also to the electricity industry in Ontario, and have played a major role in defining the structure of the Electrical Safety Authority.

These years saw ongoing efforts to negotiate responsibility for special inspection between Ontario Hydro and CSA. In 1960 Ontario Hydro formally adopted CSA approval reports for use across Ontario. In 1967 Ontario Hydro requested that CSA take over all special inspections with the exception of "one-of-a-kind" and limited manufacturing of special equipment. Discussions continued in an effort to minimize Ontario Hydro’s involvement in providing special inspection services.

**Phase 2: 1980-1990 Ontario Hydro Restructuring**

In the 1980’s OHEI faced a new issue: free trade and its implications on safety regulations for products moving across borders. In 1990, the Standards Council of Canada assumed responsibility for examining and accrediting U.S. laboratories. In addition CSA has received Nationally Recognized Testing Laboratory Accreditation from the U.S. Occupational Safety and Health Administration. In 1990, the first harmonization of Canadian/United States standards created a standard for heating and cooling equipment.

In addition to Free Trade, the Utility industry in Ontario was experiencing financial pressures. Management of the electrical inspection business was changing, and there was an increasing focus on marketing and customer service as means to growing compliance to the rules and regulations for electrical products and installations in Ontario. In addition, Inspection was challenged to downsize and increase financial performance in response to Utility challenges to reduce the cost of power.

During this time financial pressures at Ontario Hydro resulted in downsizing across the organization, and eventually lead to electrical in inspection working arms length as a financially self-sustaining line of business within the Ontario Hydro infrastructure.

The Electrical Inspection Division worked to increase business efficiency by automating administrative processes, and introducing new technologies (computers and cell phones).
In addition, the inspection business took informal steps to adopt “quality control” processes rather than traditional inspection services. This was supported by a strategic business positioning that reinforced electrical performance at the front-end of the process based on contractor skills and past performance, as opposed to reviewing installations at the end of the process.

Relationships between Electrical Inspection as a business entity and the contractor community, including their representative associations, were strengthened to support customers in understanding changes that were about to be introduced to inspection operations.

In early 1990, as it began entering its second century of operation, Ontario Hydro’s Electrical Inspection Division undertook a review to determine how well it was meeting the needs of its end users. It became evident that these stakeholders had significant business issues that required attention.

Customers and Stakeholders expressed concerns that:

- *inconsistencies were occurring among the various local Inspection units.* Local management often made decisions without understanding the impact on customers in other parts of the province creating additional work and costs for clients.

- *the playing field was not level.* Installers who adhered to the regulations often found themselves at a competitive disadvantage to those who were prepared to ignore costs and standards.

- *there was no incentive offered for quality performance,* such as reduced inspections and/or lower costs.

- *permit and inspection processes were not user friendly* and not geared to the needs of clients.

- many people doing their own electrical work were unaware of potential hazards.

There were other issues as well:

- the inspection system was subsidized by the cost of power. This was contrary to the principle that those who benefit from the service should bear its costs.

- the system’s fragmented organizational structure was a barrier to developing partnerships with those who wished to become involved in electrical safety.

- two Provincial Ministries and OHEI had mandates for electrical safety, yet there was no collaboration among them, resulting in increased delivery costs.
- the existing legislation did not contain provisions for appeals, nor licensing nor accreditation of inspectors and trades personnel.

The Transition Years 1993 - 1999

Scope

In 1993 OHEI was officially established as an independent business within Ontario Hydro and as such, continued to be governed by the Power Corporation Act.

The organization underwent a major transformation, both structurally and financially. It was divided into five territories, with approximately 25 regional work centers and a staff of 260. Inspection was placed under one Provincial Manager, who exercised full control over the business. In addition, the Provincial Code Engineer was clearly made accountable for the final decisions on all electrical and safety code issues. This ensured consistency in policies, principles, and application of the safety code across Ontario.

New Mandate

Under the restructured Ontario Hydro, Electrical Inspection took ownership of a new mandate: to establish an efficient, comprehensive safety system that would provide a customer focused service for compliance monitoring and value added benefits to the electrical industry. The business was to be a stand-alone, self-sustaining operation, perceived by its customers as providing added value to their business. A marketing function was to be established to support the development of new initiatives to enhance public electrical safety.

To accomplish this new mandate, subsidization from Ontario Hydro was to be eliminated, and costs for operating the new business were to be derived from end users of services offered.

Inspection became accountable for its own liabilities and responsible for its risk insurance payments.

Business Approach

Reorganization presented OHEI an opportunity to re-visit and re-articulate the fundamental beliefs or “core values” of the business. Four distinct values were identified: safety, quality to the customer, individual respect for employees and financial viability.

A commitment was made to take a proactive approach to safety. This meant promotion of
safety through education programs and compliance through safety and code audits. Responsible code interpretation and strict compliance were established as the foundation of the “safety” value.

In its commitment to provide quality to the customer, OHEI focused on responding to client feedback and meeting customer’s needs for new services in a cost effective manner. It undertook continuous improvement of its staff and processes. It also worked to forge partnerships that would benefit its major stakeholders and customers.

Core values were established that recognized the organization’s commitment to its employees and fostered the creation of an excellent work environment. Innovation and risk taking were to be encouraged - diversity respected. A healthy, safe workplace would, of course, be the standard. Direction would be based on “leadership” and financial stewardship.

To ensure its continued financial viability, OHEI committed to benchmark and operate the business in such a manner as to ensure “best practice” margins. It committed to continually adding new products and services and to share the financial impact of its business decision with front line staff.

Customer Initiatives
In the first months of operation under the new structure, Inspection staff traveled across Ontario, meeting with customers to determine how the system could be improved. Several initiatives resulted from that consultation:

- the business structure was modified and new management positions were introduced to support business management and increase customer service.
- permits were made easier to obtain by making application by telephone or fax and credit card, and other simplified forms of payment were introduced.
- inspection staff were trained in customer service and regular feedback was obtained on their performance. Inspectors were also equipped with cellular phones, which made them more readily accessible to customers.
- an appeal process for rulings was put into effect and communicated to customers.
- a program was established to encourage and reward quality contractors with fewer inspections. (As contractors become registered under ISO 9000, process audits and spot inspections will be implemented, resulting in lower costs).
- electrical installers who ignored permits and standards to cut costs and endangered public safety were sought out and charged, thus leveling the playing field.
- cut and reconnect programs were introduced to Electric Utilities across Ontario which improved their effectiveness as well as the effectiveness of contractors and electrical inspectors.
new systems were defined support a province-wide customer relationship model that would be available through remote access to inspectors. Inspections staff were trained on management techniques, customer service, new systems, in addition to ongoing technical training.

In the process of reshaping the Electrical Inspection business, emphasis was placed on the recruitment, development and performance of individual inspectors. This was essential because in the customers’ eyes, the integrity of the service was rooted in the capability of its inspectors.

Customers were requesting more sophisticated services that, in turn, impacted day-to-day operations. Expanded services included:

- **electrical equipment approval**, used by all major industries and manufacturers. This requires international travel by staff.
- **safety code consulting**, used by engineers, consultants and electricians to obtain interpretations to the Electrical Safety Code. Surveys indicate this service should be increased.
- **educational programs**, designed to upgrade the skills of utility, consultants and trades personnel on the application of the code or code changes. This service is highly rated by customers.
- **hazard investigations**, used to assist Ministry of Labour in electrical fatality investigations or electrical shock complaints from the public. Information from these reports is used to draft new electrical safety requirements.
- **fire investigation**, geared to assisting the Fire Marshall and fire departments in ruling on the cause of fire that may be electricity related. Information taken from these reports is used to upgrade existing building, fire and electrical standards.
- **marketplace surveillance**, to ensure electrical equipment offered for sale is safe.
- **general inspection**, to provide a complete audit of the electrical system in a residence or commercial building. This service identifies electrical hazards such as over fusing, damaged or improperly installed equipment, and other potential electrical shock hazards.
- **system plan reviews**, offered to actively review consultants’ plans before work starts on wiring installations of public building, factories and other structures. This represents a major cost saving as it reduces delays during construction.
- **annual inspections**, intended to provide an audit of electrical installations at public institutions and factories for safety, insurance coverage and asset protection.
Under the operational structure introduced in 1993, OHEI entered into more active collaborations with other stakeholders who had a vested interest in safety standards and service delivery.

The organization assumed leadership of the Ontario Provincial Advisory Committee on the Electrical Safety Code. This committee makes recommendations and provides salient comment on new proposals or revisions to the Ontario Electrical Safety Code. Committee membership is comprised of representatives from industry, regulatory bodies and utilities. The Committee has no authority over the final adoption of changes to the code, since this responsibility continues to be vested by the Power Corporation Act with Ontario Hydro and the Lieutenant Governor in Council.

An important collaboration was forged with the Provincial Ministry of Labour, which is accountable to ensure that those doing electrical work are qualified. A program was developed whereby Hydro inspectors now serve as the Ministry’s “eyes” in the province. This monitoring approach continues to have a significant impact on the improvement in the safety of electrical installations.

At the Municipal Electrical Utility level, the Electrical Inspection Division conducted province-wide meetings to improve the interface between inspection and utility work crews. Subsequent changes have enabled utility crews to function more productively.

A contractor registry association was established in partnership with the Ontario Electrical League and the Electrical Contractors Association of Ontario.

To maintain greater control of electrical equipment coming into Ontario, OHEI entered into a partnership with Canada Customs. An awareness-training program has been created to train customs officials on electrical product safety.

Inspection also worked closely with the Fire Marshall’s Office. Programs have been developed to improve the safety of basement apartments, and regular meetings are held to continually identify opportunities to improve the electrical safety of Ontario buildings and residences.

Perhaps one of the more high profile alliances is the one OHEI formed with the Canadian Standards Association and Underwriter Laboratories Inc. The three groups entered into cooperative advertising partnerships to promote a consistent safety message. Campaigns have included television, direct mail and brochures. In cooperation with CSA, electrical safety awareness material has been distributed to retailers of electrical products to increase safety awareness among do-it-yourself consumers.
Business Success Comes Through Self-Sufficiency

The benefits of a re-focused and restructured business entity soon became clear. The combination of the regulatory and service delivery functions under one umbrella organization ensured consistent code interpretation and proved cost effective. Benefits included:

- the system was functionally segregated within Ontario Hydro.
- delivery of service was moved closer to the local level, reducing service delays and inspection time.
- a comprehensive system for monitoring and accrediting inspectors was adopted, resulting in reduced exposure to liability.
- customer satisfaction has risen markedly.
- the provincial structure allowed for a single focus on safety, providing greater flexibility to respond to new partnerships and to create programs geared to improved safety delivery. Combined advertising increased exposure of the safety awareness message to individuals who do their own electrical work.
- the Provincial Office of Electrical Inspection became more active in assisting government in policy and audit.
- administrative efficiency increased as paper work was virtually eliminated.
- benchmarking indicates Ontario permit fees remain competitive.

As an independent business, Inspection made both financial and productivity gains. In 1994, the first year under its new structure, Electrical Inspection costs of $27 million were about $4 million higher than revenue.

Revenue steadily increased to the point where, for the year 1997, it was projected to exceed the $34 million cost of operating the business.

Productivity gains have been significant. In 1994, revenue per staff member was $90,000. At the end of 1997, productivity had increased to just over $120,000 per staff member.

Industry Restructuring - 1999

In 1995 and 1996, reviews of Ontario Hydro, driven largely by a movement to create a competitive electricity system in Ontario also examined the electrical inspection system in the Province.
OHEI faced a number of challenges:

- marketing public safety rather than legislating it, to ensure added value service.
- maintaining competitiveness in compliance services as the monopoly supplier.
- resolving ownership and structure of electrical inspection as Ontario Hydro became unbundled.
- contractor licensing and training which impact quality of electrical work.
- developing services required to improve electrical safety but non-mandated.

Responding to these challenges would require establishing new electrical inspection business goals that would place Ontario as a world leader. New systems would be required, new programs for customer segments; guidelines for product approval field evaluations; and an increased focus on security investigations would be required. Changes that were required, but would create additional economic pressures as the business continued to respond to these challenges while maintaining self-sufficiency.

With Utility restructuring on the horizon the Electrical Inspection business faced the potential for competitive challenges from regionalized municipalities/utilities and free trade and recognition of USA labels in Canada.

**Ontario’s Electrical Safety Structure**

In 1996 The Macdonald Commission, in its 1996 review of the electrical industry in Ontario, identified four key objectives for electrical inspection to ensure both public safety and the effective provision of service:

- high quality, cost efficient inspection services.
- a straightforward, responsive process that maximizes inspection opportunities and includes an effective dispute resolution mechanism.
- provisions to ensure costs of inspection services are borne by users, without government subsidization.

By 1998 the Working Group on Electrical Inspection and Safety in Ontario was issued, and recommended a new governance structure.

This report put forward key recommendations that led to the creation of the Electrical Safety Authority, including the:
\begin{itemize}
  \item separation of the electrical inspection function from Ontario Hydro or any successor companies to prevent a real and/perceived conflict of interest.
  \item establishment of a part III Not-For-Profit Corporation under the Corporations Act.
  \item delegation of sole authority and regulatory responsibility for the delivery of electrical inspection functions to a new corporation established as an administrative authority under the Safety and Consumer Statutes Administration Act (Bill 54) through an administrative agreement comparable to that between the Technical Standards and Safety Authority and the Ministry of Consumer and Business Services.
  \item direct reporting to a Board of Directors responsible for governance, operational effectiveness, and recommending policy and regulatory changes for approval by the Government.
  \item development of the Ontario Electrical Safety Code with input from experts and stakeholders for final approval by the Lieutenant Governor In Council.
  \item maintenance of fees for service with no overall fee increase resulting from the transition of inspection responsibility from Ontario Hydro to a new corporation. Support would come from short-term financial assistance provided by Ontario Hydro.
  \item maintenance of the current mode of electrical inspection operations with a seamless transition from Ontario Hydro to a new corporation to maintain high customer satisfaction levels.
\end{itemize}

\textbf{Introducing the Electrical Safety Authority}

On April 1, 1999 the Electrical Safety Authority (ESA) was established as a not-for-profit authority accountable for public electrical safety in Ontario. Ontario's Electricity Act provided ESA with sole responsibility for regulating the safe use of electricity and equipment in Ontario, enforcing the Ontario Electrical Safety Code, appointing electrical inspectors, and prescribing fees for service. ESA would:

\begin{itemize}
  \item promote activities that enhance public electrical safety.
  \item encourage industry to take responsibility for enhancing electrical safety.
  \item educate industry, government and the public about electrical safety, and
  \item undertake activities that encourage harmonization of electrical standards and compliance.
\end{itemize}

The Electrical Safety Authority, formerly Ontario Hydro Electrical Inspection, has been the standard bearer for the safe use of electric power and equipment for more than a century.
It has an established track record of being responsive to market changes, customer needs and a new regulatory environment. It has developed a strong vision for the future of electrical inspection and safety in Ontario. That vision builds on its historic strengths and taps into its innovative, entrepreneurial spirit, and is supported by highly skilled employees who are dedicated to public electrical safety. Electrical Inspection is ready to face the challenges of the 21st century confident in its own strength and empowered by the trust and respect of its important stakeholders.

With the restructuring of the electricity industry and Ontario Hydro’s participation in a competitive marketplace, it was no longer appropriate for electrical inspection functions (Electrical Inspection) to remain within Ontario Hydro. Separation from Ontario Hydro was considered essential to prevent a real and/or perceived conflict of interest.

The establishment of a new not-for-profit, financially self-sustaining Inspection organization without share capital was deemed necessary to carry out the functions performed by Electrical Inspection. The organization was to be established as a Part III Not-For-Profit Corporation under the Corporations Act (Ontario).

Under this new governance structure, the Ontario Provincial Government (Government) has retained authority for policy and regulation approval, and monitoring performance in the area of Electrical Inspection. The respective authorities of Ministries of the Government and those organizations delegated administrative authorities are outlined in Bill 54 (the Safety and Consumer Statutes Administration Act of the Government).

Under Bill 35, the Government will delegate sole authority for the delivery of electrical inspection functions to the new corporation as the appropriate administrative authority.

The new organization will report directly to a Board of Directors, which is responsible for governance and operational effectiveness and which recommends policy and regulatory changes for approval by Government. Industry representatives will form the majority of Board membership.

Electrical Safety Code regulations, while subject to final approval by the Lieutenant Governor in Council, will be developed by province-wide electrical inspection organizations with advice from experts and stakeholders through Industry Advisory Councils.

Responsibility for interpretation of Electrical Safety Code regulations remains with the new Electrical Safety Authority.

A formal dispute resolution process will be put in place by the Electrical Safety Authority that will clearly outline the avenue parties can pursue if dissatisfied with Electrical Safety Code interpretations.
An administrative agreement comparable to that between Technical Standards and Safety Authority (TSSA) (an administrative body under Bill 54) and the Ministry of Consumer and Business Services (MCBS) was to be negotiated between the new corporation and the ministry to which it will be responsible, the MCBS.

There is to be no overall fee increase resulting from the move of Electrical Inspection to the new corporation. This does not prohibit revision of rate structures to more accurately track costs. Although the primary responsibility for additional costs associated with the establishment and initial operation of the new corporation rests with Electrical Safety Authority, additional funds for the transition were made available through Ontario Hydro.

Every effort has been made to ensure the transition to the new organization is seamless. This does not preclude future changes as a result of Government initiatives or decisions by the Board of Directors.


As a not-for-profit organization, ESA operates according to a set of principles designed to ensure an effective balance between the twin goals of protecting the public interest while supporting continued private sector competitiveness. A 12 member Board of Directors representing both industry and non-industry interests governs ESA, and further advice and guidance is provided through advisory councils. ESA is accountable to the public through the Minister of Consumer and Commercial Relations for meeting its legislative and contractual obligations in the delivery of its delegated regulatory mandate. At the same time, it is accountable to its regulated sectors for results, sound management and efficiency.