Electrical Safety Authority

RECLOSURE JURISDICTIONAL REVIEW
Best Practice

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RECLOSURE JURISDICTIONAL REVIEW

I. INTRODUCTION: PURPOSE AND SCOPE OF THE STUDY

In September 2005, the Electrical Safety Authority ("**ESA**"), on the recommendation of its Utility Advisory Council, retained Frank J. E. Zechner Professional Corporation to undertake a study, including surveys of electrical distributors across North America, to assess the timing of an attempt to re-close high voltage tripped feeder breakers after an Autoreclose/lockout event.

Frank J. E. Zechner, the principal of Frank J. E. Zechner Professional Corporation, has been a representative of the Ontario Sewer and Watermain Construction Association on the ESA's Utility Advisory Council since the establishment of that council in 2002. Frank Zechner had previously undertaken surveys of U.S. utility locate response standards and legislation as part of his ongoing work with the Ontario Regional Common Ground Alliance.

The study was to be based on a survey questionnaire, the form of which was subject to the prior approval of the ESA, together with a review of any standards, codes or regulations referenced in the survey responses. The study also included an independent review of published standards, codes and regulations and to comment on any provisions related to the recloser feature of tripped breakers and the restoration practices used in conjunction with this feature.

II. AUTOMATIC RECLOSER FEEDER BREAKERS FEATURE

Automatic recloser feeder breakers feature is a specific type of control feature that causes a feeder breaker to open or close based on preset timers and controls. They are used in electrical power distribution systems in association with feeder breakers and associated step down power transformers. The purpose of the automatic recloser feature is to reduce the number of power outages in distribution systems that would otherwise require the electrical distributor to dispatch inspection and repair crews to identify the cause of a momentary line fault. Due to the fact that some electrical faults are transient, often caused by a lightning strike or momentary contact with tree branches during storms, or a small animal or bird, the automatic recloser feature will re-energize the feeder after a preset time interval ranging from less than a second to several minutes. If the fault has cleared after the preset time interval, the recloser will allow the line to remain energized. If the fault has not cleared after the preset time interval, the recloser device will make one or more further attempts to re-energize the feeder after a further period of time, or maintain the line in a de-energized state. The Distributor may then have procedures in place to attempt to re- energize the tripped feeder once again.

III. SURVEYS OF ELECTRICAL DISTRIBUTORS

The form of survey approved for use as part of this study is set out in the attached Schedule A. The distribution list for the survey is also provided in Schedule A. The writer received 11 completed survey forms from Ontario and Alberta.

There was some interest in the issue expressed by other Canadian electrical distributors outside of Ontario, however we were unable to obtain a completed survey form from them.

Contact was also initiated with the following regulatory agencies having safety related jurisdiction over their respective US based electrical distributors: California Public Utilities Commission, Colorado Public Utilities Commission, Georgia Public Service Commission, Illinois Commerce Commission, Michigan Public Service Commission, Minnesota Public Utilities Commission, Missouri Public Service Commission, New York State Public Service Commission, Ohio Public Utilities Commission, Pennsylvania Public Utility Commission and the Wisconsin Public Service Commission. No written replies were provided however several of the commissions stated that the interval timing for automatic reclosing feature is left to the discretion of the electrical distributors.

IV. SURVEY RESULTS

A summary of the survey results is shown below:

Question 1

(a) In the event of a fault, after the automatic reclosing feature has attempted to reclose and trips out again, does your restoration procedure include an attempt to reclose after approximately one minute?

Yes 3 No 1 Varies 7

(b) Does the response to Question 1(a) depend on whether the feeder lines are overhead or underground?

Yes 5 No 6

Question 2

Does the response to Question 1 depend on the voltage of the lines?

Yes 0 No 11

Question 3

Is your organization's response to tripped feeders dictated by a code, regulation or statute?

Yes **3*** No **8**

* In one response that indicated that the utility was guided by a code, regulation or statute, no specific information was provided, in the other two responses, reference was made to an internal codes or policies.

Question 4

If your organization's restoration procedures include an attempt to reclose a tripped feeder, what is the wait time to reclose?

Less than 15 seconds	**1**
Between 15 and 30 seconds	0
Between 31 and 60 seconds	**5**
Between 61 and 90 seconds	0
Between 91 seconds and 5 minutes	**1**
Between 5 and 10 minutes	**1**
More than 10 minutes	0
No time in specified in survey response	**3**

Question 5

What procedures listed below are followed prior to the restoration of service?

(a) Visual inspection of feeder and/ or fault indicators? Yes **8** No **3**

(b) Sectionalize the feeder and reclose? Yes **8** No **3**

V. APPLICABLE CODES, REGULATIONS OR STATUTES

Canada
There are no statutes or regulations in Ontario or in any other Canadian province or territory or at the federal level that specifically regulate the operation of recloser breakers for electrical distribution lines. Similarly the writer has been unable to find any specific elements in the Canadian Electrical Code or any other code in Canada regulating the operation of recloser breakers for electrical distribution lines.

United States
The writer has been unable to find any statutes, regulations or codes in any US State or at the US federal level that specifically regulate the operation of recloser breakers for electrical distribution lines. There are no provisions in the U. S. National Electrical Safety Code that address the operation of recloser breakers in electrical distribution lines.

VI. CANADIAN COURT DECISIONS

The writer was able to identify the following four reported court decisions in Canada related to

Stevens v. Chatham City (Supreme Court of Canada, 1934)
A mill in the City of Chatham was destroyed by fire. The fire was started by lighting striking electrical distribution lines from Chatham Public Utilities Commission. The fire fighting brigade of the City came to the fire but were fearful of entering the building until the power was first shut off. Telephone calls were made to the operator of the electric substation who refused to switch off the current. By the time a senior manager arrived to intervene, the fire had spread and the mill could not be saved.

The mill owners commenced an action for damages caused by the delay in shutting off electrical power after demands were made. The court ruled that the utility was not liable to the mill owners as no negligence had been clearly demonstrated in the design of the electrical system or in the conduct of the utility and city employees.

W.H. Miller Co. Ltd. v. New Brunswick Electric Power Commission (New Brunswick Supreme Court, Appeal Division, 1974)
The plaintiff operated a lumber mill and purchased its power supply from the defendant utility. The plaintiff's employees noted some lights dimming when they turned on some equipment in the plant. When the equipment was turned off the lights remained dim. It was then observed that there was arcing at the entrance to the circuit breaker for the plant. Because there was no method by which the employees could stop the flow of power from the transformers of the utility to the

entrance box on the interior wall of the mill, coupled with the fact that the fire could not be fought until the flow of electrical power to the mill was interrupted, much of the mill was destroyed by the fire. The case was decided in favour of the defendant utility on the basis that the Plaintiff's electrician had forbidden any person from touching the entrance box for electrical power both before and during the incident.

Marliese v. West Kootenay Power Ltd. (1993)
This case involved a 65 year old tree that fell onto a power line during a storm. The line was knocked down to the ground and the Plaintiff's husband was electrocuted by the energized line on the ground. The Distribution Engineering Manager for B.C. Hydro, was called as an expert witness on behalf of the defendant. He acknowledged that the tree in question would be a hazard tree under the B.C. Hydro Policy. The Court ruled that it is no defence to say that an accident of this nature had not happened in the past sixteen years of record keeping in the defendant company. In this case a 65-foot dead tree was 31 feet 8 inches from a line carrying 7200 volts of electricity in an area where high winds blow in the direction of the wire. The Court found that such a tree requires close inspection and that if the tree had been closely inspected it would have been apparent that it was beyond revival, that it was infested by insects and used by woodpeckers. It was going to fall down and only the timing of that event was unpredictable. The tree was a hazard tree by West Kootenay's own standards and West Kootenay should have foreseen the risk involved in leaving the tree in place. The next issue was whether or not the fuse should not have operated to de-energize the wire. The distribution line in question carried 7200 volts. The line was protected by a 20 ampere fuse. The dead tree when it struck the wire would not ground it because the dead wood would be a poor conductor. When the wire came down it would not be held down by the dead tree because the steep slope of the bank would mean that the tree would come to rest on the top of the bank leaving a space between the tree and the place on the bank where the downed wires came to rest. The tree would not therefore press the energized wire into the bank to ground it and instead the wire would lie on top of the dry foliage which would create very little resistance. The Court concluded that the Defendant had to be aware that the use of a 20 amp fuse in the dry climate of the Okanagan combined with the fact that dead trees would not be good conductors made it foreseeable that a dead tree could bring a wire down and it could well bring it down in a place where it would remain energized. The Court concluded that it was foreseeable that it would not necessarily de-energize a wire that is lying on dry ground, that the wire would remain energized and, that being the case, it was foreseeable that damage might occur. The court ruled in favour of the Plaintiffs for the negligence of the Defendant.

VII. U.S. COURT DECISIONS

Roehrman v. D.S. & O. Rural Elec. Cooperative Assoc. (Sup. Ct. of Kansas, 1955)

The case is an action by an employer to recover damages that it and its employee sustained as a result of a failure of an automatic recloser device to operate. A wooden pole failed when hit by an automobile and live wires fell to the ground. Response crews found the empty automobile and started a search for the driver and any other vehicle occupants. During the search, about four hours after the initial accident, one of the employees accidentally contacted one of the energized lines causing serious and permanent injuries. The Plaintiff alleges that the automatic recloser device did not operate in the intended manner and that the failure of that unit was attributed to the lack of inspection and maintenance by the electrical utility. The appellate court upheld the original ruling of the trial court that the Defendant and the Plaintiff were both negligent and that a partial judgment was maintained in favour of the Plaintiff.

Fowler v. Tennessee Valley Authority (US District Court, 1962)

The case involves a wrongful death claim for two men electrocuted when they were attempting to install a roof top television antenna. The antenna came into contact with nearby power lines. The plaintiffs alleged that the deceased sustained two separate electrical shocks, the first of which rendered them unconscious, after which an automatic recloser device temporarily interrupted power supply for about 15 seconds. After the 15 seconds had elapsed, the switch reclosed restoring power to the line which allegedly caused the deaths of the two deceased. In reviewing considerable evidence on the matter the court ruled in favour of the defendant utility. The Court noted that the equipment, namely the automatic reclosing device, was properly functioning before and after the event, and that it was not proven that a second shock was the cause of death. The Court went on to note that automatic circuit breakers on distribution lines function an average of 1,000 times per week in a system the size of the Tennessee Valley Authority. If the utility were required to investigate each momentary overload and interruption of power, either no electricity would be supplied and the electric companies would spend all of their time patrolling lines, or the Court would be imposing absolute liability upon any supplier of electricity. On the basis of the preceding analysis, the Court dismissed the claims for wrongful death.

McGarry v. United States (US Court of Appeals, 9th Circuit, 1976)

The widow and children of a deceased worker initiated an action based on wrongful death. The trial court had awarded damages to the family and the defendant government agency had appealed against that decision.

Prior to his death, he and another worker were engaged in drilling exploratory holes at a Nevada test site. Using mobile hydraulic machinery the workers set up for the drilling of the first hole and them observed unusual noises from the machine and motor, oil spilling from the unit and sparks. The first worker went

over, touched one of the rubber tires, noted that it was hot and he received a slight electrical shock. He then touched the drilling machine and was immediately electrocuted. The second worker then looked up and noted that the mast of the drilling machine was in physical contact with overhead wires. The electrical system included circuit breakers that immediately de-energized the line when contact was made by the upright mast. The system also provided for three automatic reclosers of the de-energized circuit: instantaneously after the first de-energizing contact, again after 15 seconds, and again after an additional 30 seconds.

The government argued that recovery was barred for two reasons, first the deceased failed to note the presence of overhead power lines when using the mobile drilling unit with an extended vertical mast. Secondly the death resulted from the worker's physical contact machine after observing sparks flying from a tire and oil running from the engine. The Appellate Court indicated that the deceased may have been partially justified in making physical contact with the drilling unit if he believed that the line had been de-energized upon the initial contact with the mast of the drilling unit. The Court remanded the case back to the trial court for further findings of fact.

Akins v. Oklahoma Gas & Electric Co. (US District Court, 1977)
This is an application by the defendant utility to dismiss the plaintiff's action for physical injury and lost wages. The plaintiff was hired to do certain work on electrical transmission lines owned and operated by the defendant. The Plaintiff was drilling into a wooden pole and he received a high voltage shock when said drill came into contact with a primary line. The plaintiff's claim is unique in that he is not claiming for injuries caused by the initial contact between the drill and the primary line, but rather is claiming for injuries sustained caused by a recloser of the automatic circuit breaker. The court noted, on the basis of affidavit evidence that the fault "burned itself out before attaining the necessary ampage to trip the circuit breaker. The Court ruled in favour of the defendant utility and dismissed the Plaintiff's claim.

Valcaniant v. Detroit Edison Company (Michigan Supreme Court 2004)
The plaintiff owned a four acre site on which he operated a used car business. In the course of doing some construction and adding fill to the lot, the Plaintiff was providing directions to a dump truck. As the truck released its load, it rose upward and the bed of the truck contacted an overhead power line. The ground was wet and the power flowed through the truck, continued through the ground to the plaintiff who was standing seven feet away, knocking him unconscious. An automatic recloser device detected the fault in the severed line almost immediately and momentarily stopped the current flow. The automatic recloser device operated as intended, it restarted the current three times and then de-energized the line when the fault failed to clear. The Plaintiff suffered burns to his back and arms from the shocks that he received while the automatic recloser device completed its cycles. The Plaintiff argued that Edision had a legal duty to

de-energize the lines immediately and completed after it was severed the first time by the dump truck.

The trial court ruled in favour of the Plaintiff and the Appeal Court reversed the ruling and granted judgment in favour of the Defendant Edision. The Michigan Supreme Court affirmed the Appellate Court decision and ruled in favour of the utility. The court found that Edison had no obligation to anticipate that the dump truck operated under the Plaintiff's direction would sever an overhead power line that was suspended more than 25 feet above the ground, much less that the Plaintiff would be standing on wet ground several feet away. As a result, Edison had no legal duty to anticipate that the Plaintiff might be injured when the recloser briefly re-energized the line as it was designed to do.

VIII. CONCLUSIONS

The survey results are inconclusive. Restoration practices vary between the Distributors that did respond.

There are a number of reported court cases in both the US and Canada that have examined the liability of the utility for injuries and damages allegedly caused by the reclosing of an automatic reclosing feature. The use of automatic recloser feature is acknowledged as being a practical necessity in distribution systems. The cases do however indicate that automatic reclosing feature, like any other element of a distribution system, requires regular inspections and maintenance. The cases also suggest that the utility needs to ensure that their system must de-energize the line when there is a sustained fault.

There has been no indication in any of the court decisions that suggested what the optimal response or timing for attempting to re-energize the lines should be. There is no indication in any of the codes, regulations or other standards indicating what the appropriate intervals should be for attempted re-energizations of affected distribution lines. US regulatory agencies indicate that those decisions are left to the discretion of individual electrical distributors.

End of Report

Schedule A - 1
List of Distributors that were requested to participate in the survey

CANADA

1. British Columbia

a) BC Hydro
Website: http://www.bchydro.com/
Geographical Area Served 94% of the Province of British Columbia including Vancouver and Victoria.

b) Fortis BC, a wholly owned subsidiary of Fortis Inc.
Website: http://www.fortisbc.com
Geographical Area Served A small portion in the south center area of the Province along the US border, including the southern parts of the Okanagan Valley, Penticton, Osoyoos and Nelson.

2. Alberta

a) EPCOR Energy Inc. & EPCOR Energy Alberta Inc.
Website: http://www.epcor.ca
Geographical Area Served About 12% of the Province including Edmonton and parts of Central Alberta.

b) ATCO Electric
Website: http://www.atcoelectric.com
Geographical Area Served About 2/3rds of the Province including the northern half and parts of Southeastern Alberta.

3. Ontario

a) Toronto Electric System Limited
Website: www.torontohydro.com
Geographical Area Served: The City of Toronto

b) Enwin Powerlines Ltd.
Website: www.enwin.com
Geographical Area Served: The City of Windsor

c) Burlington Hydro Incorporated
Website: www.burlingtonhydro.com
Geographical Area Served: The City of Burlington

d) London Hydro
Website: www.londonhydro.com
Geographical Area Served: The City of London

e) Waterloo North Hydro Incorporated
Website: www.wnhydro.com
Geographical Area Served: Northern part of the Region of Waterloo

f) Peterborough Utilities Services Incorporated
Website: www.puc.org
Geographical Area Served: The City of Peterborough

h) Oakville Hydro Corporation
Website www.oakvillehydro.com
Geographical Area Served: The City of Oakville

i) Guelph Hydro Electric Systems Incorporated
Website: www.guelphhydro.com
Geographical Area Served: Guelph

j) Hydro Ottawa Limited
Website www.hydroottawa.com
Geographical Area Served: Ottawa and the village of Casselman

k) North Bay Hydro
Webiste: www.northbayhydro.com
Geographical Area Served: North Bay

4. Quebec

Hydro-Québec, a corporation wholly owned by the Province of Quebec
Website: http://www.hydroquebec.com/en/
Geographical Area Served: Province of Quebec

5. Nova Scotia

Nova Scotia Power Inc.
Website: www.nspower.ca
Geographical Area Served: The Province of Nova Scotia

UNITED STATES

6. California

a) Imperial Irrigation District
Website: http://www.iid.com
Geographical Area Served : Southeastern portion of California including San Diego.

b) Pacific Power and Light Company, a subsidiary of Pacificorp
Website: http://www.pacificorp.com/
Geographical Area Served: 1.6 million customers in northern California.

c) San Diego Gas & Electric
Website: http://www.sdge.com/
Geographical Area Served 3.3 million consumers in San Diego and southern Orange counties.

d) Southern California Edison
Website: http://www.sce.com/
Geographical Area Served : Several counties surrounding the City of Los Angeles including parts of Los Angeles and Orange County.

e) Anaheim Public Utilities Department
Website: www.anaheim.net
Geographical Area Served: City of Anaheim

7. Colorado

a) Southeast Colorado Power Association
Website: http://www.secpa.com
Geographical Area Served: Parts of 11 southeastern Colorado counties.

b) Xcel Energy
Website: http://www.xcelenergy.com
Geographical Area Served: Most of central Colorado including Denver and Boulder.

c) Platte River Power Authority
Website: http://www.prpa.org
Geographical Area Served: Small area of north central Colorado that includes Estes Park, Fort Collins, Longmont and Loveland

d) United Power
Website: http://www.unitedpower.com/

Geographical Area Served: Serves 55 000 meters north and west of Denver

8. Massachusetts

a) Western Massachusetts Electric Company
website: http://www.wmeco.com
Geographical Area Served: 200,000 in 59 communities throughout western Massachusetts.

b) Massachusetts Electric
Website: http://www.nationalgridus.com/masselectric
Geographical Area served: 1.2 million customers in 168 Massachusetts communities throughout the State

c) NSTAR
Website: http://www.nstaronline.com/
Geographical area served: 1.4 million customers in more than 100 Massachusetts communities including the City of Boston.

9. Ohio

a) First Energy
Website: http://www.firstenergycorp.com/
Geographical Area served: About 25% of the land territory of the State of Ohio.

b) AEP Ohio
Website: http://www.aepohio.com
Geographical Area Served: 1.4 million customers in Ohio including the City of Columbus.

c) Cinergy
Website: http://www.cinergy.com
Geographical Area Served: The southwest region of Ohio including the City o Cincinnati.

d) Buckeye Power Inc
Website: http://www.buckeyepower.com
Geographical Area Served: 77 of Ohio's 88 counties, about 40% of the state's land areas, including most rural areas.

10. New York State

a) New York State Electric & Gas Corporation
website: www.nyseg.com
Geographical Area Served: About 40% of the land territory in upstate New York including Ithaca, Geneva and Plattsburgh

b) Rochester Gas and Electric Corporation
Website: www.rge.com
Geographical Area Served: Rochester

c) Consolidated Edison Company of New York, Inc.
Website: www.coned.com
Geographical Area Served: New York City

d) Central Hudson Gas and Electric Corporation
Website: www.cehud.com
Geographical Area Served: North of New York City to the southern portions of the City of Albany

e) Jamestown Board of Public Utilities
Website: www.jamestownbpu.com
Geographical Area Served: City of Jamestown

11. Tennessee

a) Nashville Electric Service
Website: www.nespower.com
Geographical Area Served: Nashville

b) Memphis Light Gas and Water
Website: www.mlgw.com
Geographical Area Served: Memphis

c) Southwest Tennessee Electric Membership Corporation
Website: www.stemc.com
Geographical Area Served: Chester, Crockett, Fayette, Hardeman, Haywood, Henderson, Madison and Tipton Counties

12. Michigan

a) Indiana Michigan Power
Website: http://www.indianamichiganpower.com/about/default.asp
Geographical Area Served: Southwest area of State

b) DTE Energy
Website: http://my.dteenergy.com/products/electricity/index.do
Geographical Area Served: Detroit and southeastern Michigan

c) Great Lakes Energy
Website: http://www.gtlakes.com
Geographical Area served: Central Michigan on the eastern shore of Lake Michigan

d) Thumb Electric Co-opeative
Website: www.tecmi.coop
Geographical Area Served: South central Michigan

13. Georgia

a) GreyStone Power Corporation
Website: www.greystonepower.com
Geographical Area Served: Portions of eight metropolitan Atlanta counties including Douglas, Paulding, Cobb, Fulton, Coweta, Fayette, Carroll, and Bartow.

b) Savannah Electric and Power Company
Website: www.southernco.com/savannah/
Geographical Area Served: 140,000 customers in a 2,000 square mile area including nearly all of Chatham and Effingham counties and parts of Bryan, Bulloch and Screven counties.

c) Georgia Power
Website: www.southernco.com/gapower/
Geographical Area Served: 2 million customers are in all but six of Georgia's 159 counties.

d) Carroll EMC Electric Membership Corporation
Website: www.cemc.com
Geographical area served: Rural areas of West Georgia including Carroll, Floyd, Haralson, Heard, Paulding, Polk and Troup counties.

14. Virginia

a) Dominion Virginia Power
Website: http://www.dom.com/about/companies/vapower/index.jsp
Geographical Area served: Approximately 40 to 50% of the state, primarily in northern and eastern Virginia.

b) NOVEC
Website: www.novec.com
Geographical Area Served: 120,000 homes and businesses in Clarke, Fairfax, Fauquier, Loudoun, Prince William and Stafford counties, the City of Manassas Park and the Town of Clifton.

c) Central Virginia Electric Cooperative (CVEC)
Website: http://www.forcvec.com/about/about.htm

Geographical Area served: 30,000 account holders in 14 counties in central Virginia.

15. Illinois

a) Menard Electric Cooperative
Website: http://www.menard.com/
Geographical area served: Counties of Cass, Logan, Macon, Mason, Menard, Morgan, Sangamon and Tazewell.

b) Southern Illinois Electric Cooperative (SIEC)
Website: http://www.siec.coop/
Geographical area served: Southern Illinois including the counties of Alexander, Johnson, Massac, Pope, Pulaski and Union.

c) Ameren CILCO (formerly Central Illinois Light Company)
Website:
http://www.ameren.com/AboutUs/ADC_AU_AmerenCILCO_home.asp
Geographical Area served: 205,000 customers in Peoria, East Peoria, Pekin, Washington, Lincoln, Morton and Tuscola counties

d) Eastern Illini Electric Co-operative
Website: http://www.eiec.org
Geographical area served: 13,000 customers in the counties of Champaign, Douglas, Edgar, Ford, Iroquois, Livingston, McLean, Moultrie, Piatt, and Vermilion

e) Southeastern Illinios Electric Co-operative
Website: http://www.seiec.com/_index/index.htm
Geographical area served: 22,000 customers in 8 counties at the southern edges of Illiniois

Schedule A - 2
Form of Cover Note and Survey Questionnaire

Name & Position	……..
Organization	……..
Contact information	Tel: (…) ….-…… E-mail: ……..@.....
Date	

Frank J. E. Zechner Professional Corporation is conducting research for the Electrical Safety Authority (ESA) of Ontario, Canada on the responses by US and Canadian electrical distribution utilities for the local operating rules for the restoration of service after the automatic trip of feeders (up to 44kV) .

The Electrical Safety Authority (**ESA**) is a stand-alone, financially self-sustaining not-for-profit corporation accountable to the public through the Ontario Ministry of Government Services for the development of safety guidelines, enforcement of various regulations under the *Electricity Act, 1998*. At the same time, it is accountable to its regulated sectors for results, sound management, and efficiency. One of the regulations of primary interest to electrical distributors is Ontario Regulation 22/04 the *Electrical Distribution Safety* Regulation, which was passed in 2004 and establishes objective based electrical safety requirements for the design, construction, and maintenance of electrical distribution systems owned by licensed distributors.

We are in the first stage of this project, collecting data and information on the responses by various electrical distributors across Canada and the continental United States on how they respond to tripped feeders. The ultimate goal of the attached survey is to assist in identifying what standards would be most appropriate for Ontario based electrical distributors.

We therefore seek your assistance and ask you to review, complete and return the attached questionnaire. Participants that complete and return the questionnaire will be provided with a complimentary electronic copy (pdf file) of the final report and appendices

We will take all reasonable steps to ensure that your survey responses will, to the extent possible, be suppressed so that there is no linkage between the source of data and the nature of data, as well as there will be no sharing of the confidential information.

Question 1

(a) In the event of a fault, after the automatic reclosing feature has attempted to reclose and trips out again, does your restoration procedure include an attempt to reclose after approximately one minute?

Yes _____ No _____ Varies _____

(b) Does the response to Question 1(a) depend on whether the feeder lines are overhead or underground?

Yes _____ No _____

Question 2

Does the response to Question 1 depend on the voltage of the lines?

Yes _____ No _____

Question 3

(a) Is your organization's response to tripped feeders dictated by a code, regulation or statute?

Yes _____ No _____

(b) If yes please provide a reference to the section number and full name of the applicable code, regulation or statute

Question 4

If your organization's restoration procedures include an attempt to reclose a tripped feeder, what is the wait time to reclose?

_____ minutes _____ seconds

Question 5

What procedures listed below are followed prior to the restoration of service?

(a) Visual inspection of feeder and/ or fault indicators?
Yes _____ No _____

(b) Sectionalize the feeder and reclose?
Yes _____ No _____

(c) Other procedures (please provide details)