

**REPORT TO THE ATTORNEY GENERAL
PUBLIC INQUIRY
THE FATALITY INQUIRIES ACT**

CANADA
PROVINCE OF ALBERTA

WHEREAS a Public Inquiry was held at The Law Courts
in the City of Edmonton
(City, Town, etc.) (Name of City, Town, etc.)
on the 8th day of April, 1994 (and by adjournment
on the 19th day of May, 1994), before
The Honourable Judge P.C.C. Marshall, a Provincial Court Judge.

A jury was was not summoned and an Inquiry was held into the death of
ROBERT BURNETT 42 yrs.
(Name in Full) (Age)
of Edmonton, Alberta and the following findings were made:
(Residence)
Date and Time of Death April 30, 1994 at 2120 hours
Place Misericordia Hospital, Edmonton, Alberta

Medical Cause of Death ("cause of death" means the medical cause of death according to the International Statistical Classification of Diseases, Injuries and Causes of Death as last revised by the International Conference assembled for that purpose and published by the World Health Organization — The Fatality Inquiries Act, Section 1(d))

Electrocution

Manner of Death ("manner of death" means the mode or method of death whether natural, homicidal, suicidal, accidental or undeterminable — The Fatality Inquiries Act, Section 1(g))

Accidental

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Circumstances Under Which Death Occurred:

Robert Burnett was a serviceman/installer, employed by Sign-O-Lite Signs Ltd. of Edmonton, Alberta. At the time of his death, on April 30, 1992, he was married with at least one child, a daughter, and he was 42 years of age.

Sign-O-Lite Signs Ltd. is a company duly incorporated in Alberta in 1970. It is amalgamated with one, 32262 BC Ltd., a company incorporated in British Columbia and registered in Alberta as an extra-Provincial corporation. Both are part of an international entity known as the "Scion Group". Sign-O-Lite Signs Ltd. is engaged in the business of manufacturing, leasing, selling and servicing display signs throughout Alberta. These include neon signs and other kinds of illuminated signs.

Clearly the company, and its associates, have been engaged in this business in Alberta, British Columbia, and parts of the United States, for many years.

As a serviceman/installer, Mr. Burnett was required to install new or replacement signs, to remove signs, and to provide service to the signs, as required.

His resume indicated that he had been engaged in this type of work for some 22 years. He was a serviceman/installer for Neon Products Ltd., from 1970-1977, and he was a foreman of operations from 1977-1980 for Wallace Neon Ltd. of Edmonton, Alberta. He was a commission salesman for the lease and sale of illuminated signs and also the troubleshooter for Nordic Neon Ltd. of Edmonton, Alberta from 1980-87. For part of that same time during 1985 and 1987 he also sold and leased signs for Signcorp Ltd. of Edmonton, Alberta. From 1987-1990 he was the owner and salesman for Street-Ad Marketing Ltd., which company operated as a broker for the manufacture, sale, lease and installation of illuminated signs. From 1990-1991 he was a commission salesman for P.D.Q. Signs of Edmonton, Alberta for the sale of various types of display signs.

It is clear that Mr. Burnett was very experienced in the field, having been actively engaged in the installation and servicing area from 1970 to 1980, and in the selling and leasing area from 1980 to 1991.

By reputation, in this rather close-knit industry where there is considerable movement of employees from one major company to another, he was known as one of the best in terms of servicing and installing signs. He had spent 7 years with Neon Products Ltd., which is the largest sign company in Canada, and is one which is recognized as a leader in this business and its employees are known to be "well-trained". Mr. Burnett was known to be well organized, neat and professional, in his work.

When Mr. Burnett applied to work for Sign-O-Lite Signs Ltd. in 1992 he was already known to the regional manager. His good reputation was known, his resume and experience were considered, he was interviewed at least once, and upon head office approval, he was hired.

Although Mr. Burnett was thoroughly experienced, he was not an electrician. Being an electrician was not a requirement for the position of serviceman/installer, as far as Sign-O-Lite Signs Ltd. was concerned, nor apparently, as far as any of the employers engaged in this business, were concerned.

Once Mr. Burnett was hired he was assumed to be qualified to do the work concerned, without more. He was not required to attend any courses on installing, removing or servicing of signs, nor to attend any courses on safety or procedure, nor were instruction books or check lists provided nor, as far as the evidence at this Inquiry revealed, were any of the foregoing, available at that time. There was in existence at that time the Canadian Standards Association CAN/CSA-C22.2 No. 207 detailed bulletin on Portable and Stationary Electrical Signs and Display, published in 1989.

Realistically speaking, this practise of hiring employees, for this position, in this

manner, and more particularly the use of unqualified electricians to do the work concerned, seems to have worked well in the past, because the evidence at the Inquiry revealed that this was the only fatality known to the witnesses, arising from this kind of work. That observation is made, recognizing that the loss of even one life, in such circumstances, is tragic and lamentable. It cries out for much sober reflection as to what changes can be made to try and ensure that such an unfortunate happening will not occur again. Nevertheless, when one considers the thousands of jobs that must have been done over the years, by such "uncertified" employees, the result thereof (as sad and disastrous as it was in this one instance), but for this single fatal incident, would likely not trigger any pressing need for change in that practise, as far as the industry is concerned.

However, this is not the view of the representatives from the government regulatory bodies who gave evidence. Based upon the requirements of *The Occupational Health and Safety Act* R.S.A. 1980 , C.O.-2, and the regulations thereunder, it was submitted that since the work concerned may endanger an employee, the employer is required to ensure that such work is done only by a competent worker, and further, that such worker is made aware of this requirement. "Competent" is defined elsewhere as being "adequately qualified, suitably trained and with sufficient experience safely to perform the work....without or with only a minimal degree of supervision". A check was made by the witness with the Career Development branch as provided for in *The Manpower Development Act*, R.S.A. 1980 C.M.3, and it was determined that Mr. Burnett was not an apprentice nor a journeyman electrician. Hence, by the provisions of the regulations issued under *The Manpower Development Act*, the work of repairing ballasts on a sign, which work is part of the work that a serviceman/installer does, is "electrical work" which can only be done by a qualified electrician or an apprentice. There are certain exceptions thereto but not for serviceman/installers. Under the Electrician Trade Regulation, enacted under *The Manpower Development Act*, there is a means set out by which one can obtain a Certificate of Proficiency, as an apprentice or journeyman electrician and hence "qualified", and further in this regulation, there is an exemption for sign installers, provided that they become accredited, pursuant to s. 14(c) of *The Manpower Development Act*, which section allows for

the development and approval of policies of accreditation through training programs. Unfortunately at that time, no such training program was then available.

Clearly then there was a difference of opinion between the government officials and the industry as to who should be qualified to do the work of a serviceman/installer. The evidence indicated that the use of unqualified workers to do this work was widespread in the industry, and that this was known for some time to at least some of the government officials involved, and at least some of them were concerned about it.

There were some other considerations as well. It was stated that with the 3 *Acts* concerned, and the numerous and different regulations thereunder, including different exemption provisions, that the legal requirements were not brought home to the industry, in a clear and understandable manner. Accordingly, the industry continued to operate in the manner which it had done for years, and apparently without any problems, until this unfortunate occurrence. Also the training programs provided for leading to the exception for sign installers, were not then available. The employees concerned, although not qualified, were certainly experienced in their work. From a cost point of view, it was stated that an electrician would not be that much more expensive, but the problem was of finding electricians when they would be needed, and finding electricians who were also able to work at great heights and were able to operate trucks, booms, cranes and generators, and to do the other additional work that a serviceman/installer has to do.

It was the view of the government witnesses that this accident would not have happened if a qualified electrician was doing the work, but it seems fair to observe that it happened only once in the thousands of times that "unqualified" electricians did the work, and further, qualified electricians would still be subject to human error, as is everyone.

In any event, Mr. Burnett did work for Sign-O-Lite Signs Ltd. as a serviceman/installer from March 9, 1992 until his death on April 30, 1992.

Sometime prior to April 30, Mr. Burnett was informed, likely from an office meeting, that certain work was to be done at a strip mall at 107 Street and Mayfield Road, know as Mayfield Square, in Edmonton. Ordinarily there is a service order for each job but in this case there was no service order.

Mr. Burnett was given certain Service Orders on the evening of April 29, 1992. He left the company yard at 8:30 a.m. He attended at a South Side location and serviced a "Dental Clinic" sign. Apparently he then attended at a Mohawk sign and he corrected a problem with a breaker, sometime before noon that day.

Presumably shortly after lunch Mr. Burnett, who was alone, drove to the Mayfield Strip Mall located at 107 Avenue and Mayfield Road in Edmonton. This mall houses some twelve business tenants, some of whom advertise in one of the two illuminated display signs that are located, respectively, at the north end and the south end of the mall parking lot, in front of the businesses concerned. The sign at the north end is designated as Mayfield Square I, and that sign contains advertising for six of the tenants concerned. The sign at the south end is designated as Mayfield Square II and that sign contains advertising for three tenants. These signs are approximately 300 feet apart.

Both signs are framed in tubular steel in a two part, slightly v-shaped structure, with large acrylic sheets for the advertising space, which are attached to the frame by aluminum retainers, with a wooden frame separating the advertising spaces. The signs are about 25 feet high, being slightly higher at one end because the top of the sign is not straight but rises towards the east end in about a 20 degree angle. The signs are raised up about 3 feet from the ground level and they are each anchored in a large square framed base of cement and gravel.

There was no work order for service at this mall but Mr. Burnett had been told at the earlier office meeting to attend to servicing at the display sign at Mayfield Square II.

Mr. Burnett completed the work required at the Mayfield Sign II and, while he was still there, or possibly just as he was leaving the location, he was made aware that some lamps were out at the sign at Mayfield Square I. Both signs are owned and maintained by Sign-O-Lite Signs Ltd., and assuming that he was aware of this fact, and since he had completed the work at the other sign in the Mall, and since he was there anyway, and being a conscientious employee, he decided, apparently on his own initiative, because there is no evidence that he had been ordered to do so, to also do the servicing work necessary to the sign at Mayfield Square I.

Accordingly, at about 2:45 p.m. or possibly a few minutes closer to 3:00 p.m., Mr. Burnett drove his truck up to the sign at Mayfield Square I. He angle-parked his truck facing, and near to the sign concerned. Presumably he observed the situation and decided what had to be done.

The truck concerned is a cab type front, with a flatbed about 20 feet long. On the flatbed was a motor generator to provide an alternative source or power, an eight foot wooden step-ladder, a metal extension ladder, some fluorescent light tubes, a tool box with tools, and various other items relating to the work that he had already done on other jobs, earlier that day.

Although no witness observed the actual sequence of events, nevertheless it seems reasonable and proper to conclude that he performed the following tasks, but possibly in a different order, as per the hypothesis of the government witness, which I accept:

- 1) He took the wooden step ladder and used it to get access to the bottom part of the sign where various power switches were located. With tools from the tool box he then removed the retainer and the acrylic regarding the advertising located in the lower part of the sign. He left this acrylic standing on its end and leaning against the sign.
- 2) He determined that some of the fluorescent tubes were not functioning.
- 3) He moved his truck to a new position to the west of the sign. He utilized the outrigger at the rear end of the flatbed on the truck to ensure a level surface.

- 4) He raised the metal extension ladder, which is hydraulically controlled, near to the south side of the sign to an angle of about 30 degrees to about 15 feet in the air so that he could check the tubes in the upper part of the sign which were otherwise, beyond his reach. It was a sunny day and he had to get close to these tubes in order to determine if they were lighted or not.
- 5) He determined that some of the tubes were not lighted and thus they needed replacing. Accordingly he removed the retainers from the Creditel and Olivetti signs, which are second and third from the top on this sign, and he moved the two acrylics relating thereto so that he could have access to the ballasts concerned, which he examined.
- 6) He went back to the truck and obtained a new ballast and he went back up the ladder, removed one ballast and properly installed a new replacement ballast at the bottom of the sign.
- 7) At about the same time he got possession of a paint tray which he used for garbage resulting from the replaced ballast. This tray was then taken to and left on the truck deck. He may have also replaced some tubes in the sign at about that same time.
- 8) Some time shortly prior thereto, Mr. Burnett disconnected Edmonton Power which was the power source to the sign. Evidence disclosed that C.S.A. approval signs have disconnect switches on the inside of the signs which can be switched off to stop any inflow of power while the sign is being worked upon. Apparently the disconnect switches on this sign, were not utilized because they were still on the "ON" position. There was evidence that these disconnect switches had not been properly installed, in accordance with the regulations of the *Electrician Protection Act*, but apparently they still would have worked properly in the "OFF" position. The means of cutting off the power used by Mr. Burnett was to remove the base plate at the base of the sign which is where the sign connects with the Edmonton Power source, and to disconnect the power wires. At this point there is a black wire which provides the power, a white wire which is the neutral or return wire, and a green wire which is the ground wire. He cut or unravelled the black and the white wires, and he capped some of the black wires but he did not touch the green wire. This meant that the power from the source was disconnected but the sign was still grounded to Edmonton Power. Mr. Burnett was apparently following the practice in the industry regarding disconnecting power by removing the base plate and cutting or unravelling the wire. This procedure does prevent power from getting to the sign, and that being so it obviates any necessity of turning off the disconnect switches in the sign, and, perhaps most importantly, it allows for the serviceman/installer to easily power the sign from their own generator to more readily facilitate the inspection of the sign and the tubes. Similarly, although there was no evidence on this point, it may be that the green ground wire was not cut so that it would be easier to reconnect the power and relight the sign and, of course, the sign would still be grounded by the green wire. There

are also time clock photocells that automatically put the sign on and off, but it would be difficult for Mr. Burnett to know which controlled what, and to attempt to shut off the power by this means would have been impractical.

- 9) Mr. Burnett then obtained an extension cord and he took the severed or unravelled end of one black coated wire and one white coated wire, taken from the base of the sign and he connected it to the female plug-in of the extension cord. He then plugged the extension cord to the generator. About this same time he started up the generator.
- 10) Mr. Burnett then went up the metal extension ladder to check to see if the tubes were lighted. Somewhere along the route he made contact with the metal structures of the sign, which caused him to be electrocuted.

What caused Mr. Burnett to be electrocuted was a combination of circumstances.

- a) The sign had become energized because of a faulty ballast at the top of the sign. The ballast is a little white box that contains a transformer which steps up the voltage for the fluorescent tube. This particular ballast had a fault in the internal windings of the ballast to the point that it would cause a fault to ground which, unless the circuit was properly grounded or unless there was a ground fault interrupter in place, would cause the frame of the sign to become energized. Apparently the sign became energized when it was connected to the generator, if not before, and when it was plugged in some 160 volts of electricity together with 8 amps of current were supplied to the sign, and to the frame of the sign because it was energized.
- b) Although the sign was still grounded to the Edmonton Power source, because the green wire had not been touched, nevertheless the sign was not grounded to the generator because the generator was not connected to the City green wire; therefore the generator needed its own physical connection to the ground. With the truck sitting on asphalt and dry dirt and with the truck tires acting as insulators the steel outriggers on the truck were not sufficient to provide the necessary ground.
- c) As a result when Mr. Burnett touched the frame of the sign, while standing on the aluminum extension ladder and the steel boom he completed the circuit and the electricity flowed through him to the ground.

Apparently, it is the standard practise in the industry to use portable generators to supply temporary power, and, in doing so, to wire up to the generator, just the black and the white wires, without a ground wire, as was done in this case. It was suggested that the

wiring is done in this manner because the serviceman/installer believes that the sign is still grounded, which it is, but without recognizing that it is not grounded to the temporary source of power, which is supplying the power to the sign. (i.e. the generator)

The amount of voltage that went through Mr. Burnett was likely about 160 volts or more but the critical factor was the 8 amps which causes severe muscular contractions in the chest and, essentially stops the heart from beating. The time of the accident would likely have been about 3:15 p.m.

At about 3:36 p.m. a co-worker of Mr. Burnett arrived at the shopping centre to attend to other company business. She saw the company truck parked at the sign. She decided to speak to him so she got onto the deck of the truck and climbed up the ladder. Presumably Mr. Burnett was no longer touching the frame of the sign. She saw him lying on the extension ladder with his left arm hanging down from the ladder. She got no response from him so she came down immediately and went to the dentist's office in the mall and asked the receptionist to call 911. This call was made at 3:40 p.m.

At 3:42 p.m. members of the Edmonton Fire Department arrived at the scene and at 3:47 p.m. one of them disconnected the extension cord from the sign to the generator.

At about 3:46 p.m. members of what is now called the City of Edmonton Emergency Medical Services arrived at the scene. The Fire Department members were already there as was a Basic Life-Support ambulance. There was a slight wait while the Fire Department disconnected the power and brought Mr. Burnett down the ladder.

The Medical Services people went to work at once. They observed that Mr. Burnett was not breathing and he had no pulse. They observed burns on his neck, his chest and one hand. They started resuscitation procedures which continued after he was placed in the ambulance.

One Dr. Mangan, a local medical doctor, happened to come along about 3:55 p.m. and he assisted as well, and, at 3:57 p.m., he performed a tracheotomy upon Mr. Burnett.

On the way to the Misericordia Hospital, resuscitation effort continued, but he still had no pulse and no electrical activity in his heart. He did develop a pulse in the hospital emergency department.

They arrived at the Misericordia Hospital at 4:15 p.m. and he was seen by Dr. Heule, a specialist in internal medicine and respirology, about 4:30 p.m. in the emergency department. Dr. Heule observed that Mr. Burnett did have a pulse and a very low blood pressure, and a reasonably normal heart rhythm. He had no neurological responses and he could not breath on his own. Adrenalin was given to raise his blood pressure which improved somewhat temporarily, but more and more adrenaline was required, which beyond a certain point become dangerous, and it soon became futile. He expired at 9:20 p.m., April 30th, 1992.

The cause of death was stated on the Medical Examiner's Certificate to be electrocution. There was no evidence of any alcohol or drug presence other than some lidocaine which was consistent with its use in the resuscitation efforts. The burns found on the body are consistent with electrical injury which causes death by throwing the heart out of rhythm. Certainly the cause of death was electrocution.

A prompt and thorough investigation was conducted by the Provincial Department of Occupation, Health and Safety, by Alberta Labour Electrical, and by Edmonton Power.

Certainly there can be no fault found with any of the persons who dealt with Mr. Burnett after his accident. Everything that could be done, was done, as quickly and as carefully as possible.

RECOMMENDATION FOR THE PREVENTION OF SIMILAR DEATHS

- 1) The most important recommendation that can be made is one that is now being implemented. That is that a training program arranged by the Alberta Sign Association has since June 7th, 1994, been offered at N.A.I.T., which has the blessing of the government departments concerned, and which will result in those persons who successfully complete this course in being "qualified" to do the work of sign installer, under the exemption provisions, without being an apprentice or journeyman electrician. This compulsory training program should ensure that servicemen/installers in the future will be more aware of possible dangers and the tragedy that befell Mr. Burnett, hopefully, will not occur again.
- 2) Ground fault interruption should be used in all generators involved in sign repair. Once again this Inquiry was told that that is now the case at least regarding Sign-O-Lite Sign Ltd. Ground fault interrupters, which apparently cost about \$12.00 each plus installation, sense the difference when the current coming back on the white wire is greater than what went out on the black wire, and it immediately shuts off the current. Although Mr. Burnett would still have received a shock the duration thereof would have been shorter, and his life could have been saved.
- 3) Three pronged extension cords must be used which include a ground wire whenever the generator is to be used, and where there is a connection to be made to the female receptacle concerned. Again this Inquiry was told this is now mandatory, at least regards Sign-O-Lite Signs Ltd.
- 4) A ground cable should be attached from the truck bed to the sign pylon or from the generator to the pole or to the sign thus providing a ground for the power source to the sign. There was a cable on the truck concerned hanging adjacent to the welder but it was not utilized for this purpose on this occasion.

Once again the Inquiry was told that Sign-O-Lite Signs Ltd. is doing this regularly, and indeed it is trying to make the servicemen/installers do this as a part of safety routine.

It was not made known to this Inquiry as to whether or not the other companies engaged in this business have implemented the last three recommendations, but if they have not, it is suggested that they should do so as quickly as possible.

It seems clear that all of these changes and improvements have come about primarily because of this fatal incident. In a very real sense then something worthwhile has come out of this tragedy and the untimely death of Mr. Burnett has not been entirely in vain.

Dated this 12th day of July, 1994.



Judge P.C.C. Marshall