IN THE KWAZULU-NATAL HIGH COURT, DURBAN
REPUBLIC OF SOUTH AFRICA

CASE NO. 8265/2005

In the matter between:

PAUL LAWRENCE KELLY PLAINTIFF

and

SOUTH AFRICAN PETROLEUM REFINERIES DEFENDANT

JUDGMENT Delivered on 17 June 2011

SWAIN J

[1] On 08 October 2004, the plaintiff whilst engaged in the installation of an auxiliary electrical cable into a panel, situated at an electrical sub-station known as CDU2, at the refinery of the defendant, suffered burns to his body as a result of a "flashover" which occurred in the panel.

[2] The plaintiff claims damages from the defendant for pain and suffering, disability, disfigurement, loss of amenities of life and past and future loss of earnings on the basis that the "flashover" was

caused by the negligence of the defendant and its servants in a number of respects, alleging that the defendant owed a duty of care to the plaintiff working at the sub-station, to ensure that the panels were properly maintained, free from any defects and hazard free. It is further alleged that had the defendant discharged this duty, the panel would not have exploded.

[3] With the consent of both parties, I granted an order in terms of Rule 33 (4) separating the issues of liability and quantum. I am accordingly at this stage of the proceedings, only called upon to decide the issue of liability.

[4] At the outset, it is necessary to appreciate what a "flashover" is and to determine what the most probable cause of such a phenonomen was, on the facts of this case. Mr. Michael Neale, a qualified electrician, who has also been involved in design of high voltage sub-stations and particularly sub-station control circuitry, was called by the defendant and is the author of a report dated 11 October 2004, in which he expressed his opinion as to the possible cause of the electrical short circuit and resultant fire.

[5] According to Mr. Neale, the fault may have been caused by accidental electrical contact between the neutral wire and the yellow (centre) phase busbar. Mr. Neale when giving evidence referred to photo 9, (contained in his report appearing at Exhibit "C" at page 8) and drew attention to a ridge, situated on the photo indicated by an

arrow, bearing the annotation "Note the fusion of a wire onto the chassis plate between the white and blue phases".

Such a ridge is visible in the photograph and he explained that the appearance of the ridge, was similar to that which is obtained by taking a welding rod and running a line of welding onto a flat piece of steel. This he explained was a fusion of the neutral wire onto the phase. In addition when the end of the neutral wire was examined, it was found to be annealed which meant it had become very soft. When manufactured it is hard drawn which gives the wire self-support. However, when the wire carries excessive current it becomes annealed. He then identified the missing piece of the neutral wire, which had become fused onto the chassis plate, between the white and blue phases. It was this piece of evidence, together with the annealing of the neutral wire, which played a significant part in his ultimate conclusion.

[6] Mr. Neale explained further that for the electrical fault or short-circuit to have occurred between the neutral wire and the chassis plate, it was necessary for the insulation on the neutral wire to have degraded, exposing the copper wire.

[7] According to Mr. Neale the resultant flashover, or fire, was a result of the pollution of air between the busbars with copper vapour, caused by the fusion of the copper neutral wire to the chassis plate. The presence of copper vapour in the air caused it to become conductive, with the result that what originally started off as a phase to ground fault, with one phase involved, (being white phase to earth) the arc products of the expanding air, caused the

red phase busbar to flashover, resulting in the explosion.

[8] What has to be noted is that although the plaintiff, and a witness called by the plaintiff, were somewhat sceptical that this was in fact the cause of the flashover, they did not suggest any alternative plausible cause of the blaze.

[9] The plaintiff, who is a qualified electrician, initially said that he did not believe that could have been the cause, but later in his evidence was prepared to concede it was the "likely" cause. Mr. Brett Campbell, who was the author of the so-called tripod investigation, to which reference will be made later in this Judgment, when he was called by the plaintiff, said that although the report accepted that the neutral wire contacted the busbars, he and the members of the investigation team were "highly sceptical" that this was the cause. He said that the findings of Mr. Neale although "unlikely" were the most plausible cause for the incident.

[10] In my view, the cause of the incident described by Mr. Neale, based as it is upon physical evidence apparent in the photos forming part of his report, is the most probable cause. It should be noted that Mr. Neale emphasised that in his experience, the origin of the fault should not be regarded as in doubt. He explained that the reason why he stated in his report that his evaluation of the cause is not conclusive, is because he was invited to investigate the day after the incident and had to re-assemble components that had been removed.

[11] It is therefore clear that in order for the fault to have occurred, it was necessary for the insulation to have degraded on the neutral wire, at the spot where the exposed neutral wire came into contact with the busbars. Mr. Colleton who was called by the plaintiff and who is qualified in the study of heavy electrical current, said that direct contact between the exposed neutral wire and the busbar was necessary for a direct short and flashover to result. This however was refuted by Mr. Neale, who said that if the neutral wire was close enough for the intervening air space, no longer to act as insulation, which he estimates could be two to three millimetres, a direct short could occur. This distance would however depend upon the quality of the air.

[12] What this however illustrates is that a very small movement of the neutral wire, with degraded insulation, in the location identified by Mr. Neale, would be sufficient to cause a short and flashover.

[13] The plaintiff states that he did not notice the neutral wire in the panel and that he might have brushed it with his shoulder. Whether the plaintiff brushed the neutral wire or not, the inference is inescapable that the plaintiff's movements in the panel, caused movement in the neutral wire, which in turn resulted in the short and subsequent flashover. It is grossly improbable that the occurrence of the fault was unconnected with the presence of the plaintiff in the panel.

[14] It is quite clear on the evidence that the task the plaintiff was engaged to do, namely thread an auxiliary cable through the base plate of the panel, after drilling a hole for this purpose, and then locking the cable in place with a locknut, was regarded as a low risk routine job.

[15] The plaintiff when asked about the risk assessment procedure, which preceded the performance of the task and his signature on Exhibit "D6", said the following

"Yes, we all signed off on it to say that we know whatever dangers there were but it wasn't a risk. This kind of a job is not a risk, it is something they do often, all the time, and it has never been brought as a risk factor".

[16] Mr. Alan Jones, a qualified electrician employed by Tekon Engineering, who were a contracting company permanently on site at the refinery of the defendant, and who also employed the plaintiff, and was called by the plaintiff, said that after the fuses were removed in the panel in question, for them to work in the panel "….was a very, very low risk". The reason being that once the fuses were removed the panel was then isolated from the electricity supply in the busbars, which were located behind a busbar cover.

[17] In similar vein, Mr. Brett Campbell, who at the time was employed by the defendant as the assistant area engineer for the south zone, but was called by the plaintiff, confirmed the statement

contained in the tripod investigation (Exhibit “C71”) which he authored, reading as follows:

“The incident was something of a freak accident that occurred whilst a routine job was being executed by trained personnel who had performed the job many times”.

[18] Mr. Michael Colleton, dealing with the risk assessment procedure carried out before the job was commenced and when asked specifically about the danger of insulation degradation and whether this should have been considered in the assessment, said the following:

“No, I must admit we didn’t give it a thought because, well, it went on the stuff that we knew and what we have seen happen and nothing had happened but what you are saying in hindsight, ja”.

In other words, he agreed that with the benefit of hindsight, the danger of insulation degradation should have been taken into account in assessing the risk.

[19] Mr. Michael Neale, confirmed the statement contained in his report (Exhibit “C47”) reading as follows:

“The MCC cubicle in which the contractor was working can be considered as safe while the protective barriers are in place”

adding that inadvertent contact with live electrical equipment was not possible under normal circumstances. By the use of the word

"safe" he meant "safe as it can be at the time" referring to the protective barriers in place. He meant safe to "knowledgeable people, experienced people" and safe in the sense that with the isolated busbars he would not have anticipated a flashover. In addition he expressed the view that in his experience the safety precautions that were in place were in line with safety precautions taken at plants for this type of switchgear. Regard being had to the safety barriers that were in place, he stated that it was an unfortunate accident, that could not have been foreseen.

[20] I regard the view expressed by Mr. Neale as to the absence of foresight of the risk, not as an attempt to prescribe to me the legal issue which I am called upon to decide, namely foresight of the risk of harm on the part of a reasonable man, but as an expression of his view, that the job was a low risk one. This is borne out by the contents of the Electrical Permit to Work (Exhibit "D" pages 4 – 6) being the risk assessment procedure, referred to above. The plaintiff stated that page "D6" was a risk analysis which was completed before the work was undertaken by a Mr. de Beer on behalf of Tekon, who was in charge. As pointed out above he signed this document which recorded the potential dangers, as using the wrong tools, or electric shock as a result of working on the wrong panel. Mr. Jones stated that it was recorded that the fuses had been removed, which meant that the bucket had been isolated from the main current and that the permit could not be signed until it had been done. If the panel was isolated it meant that it was safe to work on the panel. He said that he was the person on behalf of Tekon who was shown what work had to be done, and would have

been satisfied with the Permission to Work document. In his view the responses in the document were proper for the job. Mr. Campbell explained that the RAM score on the permit, denoted a figure produced by the risk assessment matrix, which was the risk involved in carrying out the task, which was determined by the probability of an incident, as well as the consequences of such an incident. This was carried out before a task in order to build a risk profile. Mr. Colleton added that Exhibit "D6" referred to by the plaintiff, was the contractor's assessment of what could go wrong, which was completed the day before the incident, when a representative of the defendant was present. Exhibit "D5" was completed by a representative of the defendant, with the contractor and he would have been satisfied with the answers supplied. The answers included positive replies to the following questions:

Do you and the people under your control understand the job requirements and the risks attached?

Have you verified that what you are working on is dead?

Have you confirmed that the work area is safe to work?

Are all live components barricaded off to avoid access?

As regards the RAM score of four on the Permit for "people" he said that this was not a high score, because the probability of injury was low, because there were no live parts. As pointed out above, he said that with hindsight the issue of insulation degradation, should have been considered when the RAM score was formulated.

[21] It is therefore clear that none of the participants in the performance of the work, foresaw the possibility of harm in the form it materialised, namely a flashover caused by the neutral wire with degraded insulation, coming into contact with the live busbar.

[22] That all of these witnesses, as trained electrical personnel (except for Mr. Campbell) did not subjectively foresee the possibility of such harm, is a relevant consideration in assessing whether a reasonable electrician, in the position of the defendant, would have foreseen the possibility of harm. The standard of the reasonable electrician is appropriate on the facts of this case, because as stated by Macaulay J, with Beck J concurring in

State v Meyer 1972 (2) (PH) H (S) 62 (R)

"On the main charge the magistrate had held that Griffiths was not negligent because he believed the apparatus to be safe and was a normal householder in the same circumstances would have similarly believed. The correct test of negligence was however whether Griffiths as a person with specialised knowledge of electricity and working with a dangerous force should have so believed, and whether he exhibited that degree of care and skill which might reasonably be expected from a competent electrician".

As regards the weight to be attached to the evidence of the qualified electricians in this case, the well known words of Innes C J in

Van Wyk v Lewis 1924 AD 438 at 444

are apposite

"And in deciding what is reasonable the court will have regard to the general

level of skill and diligence possessed and exercised at the time by members of the branch of the profession to which the practitioner belongs".

and further at pg 448

"But the decision of what is reasonable under the circumstances is for the court, it will pay high regard to the views of the profession, but it is not bound to adopt them".

[23] The plaintiff alleges that the defendant owed a duty of care to all personnel working at the sub-station and in particular to the plaintiff, to ensure that the panels were properly maintained, free from any defects and hazard free. A number of grounds are alleged in terms of which the defendant and/or its servants, acting within the course and scope of their employment, acted negligently. Amongst these are allegations that the defendant failed to ensure the panel was in good and proper working order, failed to adequately maintain and service the panel, failed to conduct adequate inspections of the panel, failed to renew components of the panel that required replacing and allowed the panel and its components to become outdated and the moving parts to become worn. Certain other allegations of negligence are made but the gravamen of the plaintiff's complaint is contained in the allegation that

"Had the panel been properly serviced and maintained, it would not have exploded".

[24] In the light of the evidence led, the omission of the defendant

relied upon by the plaintiff, was a failure on the part of the defendant to service and maintain the panel in question, in such a manner that the degraded insulation on the neutral wire in the location complained of, would have been detected timeously and replaced.

[25] In order for such an admission to be classified as negligent, a reasonable electrician in the position of the defendant would have to foresee the reasonable possibility of degradation of the insulation on the neutral wire and such un-insulated neutral wire injuring another in his person and causing him patrimonial loss, whilst performing work in the panel in question.

Kruger v Coetzee 1966 (2) SA 428 (A) at 430 E - F

[26] Whilst the precise or exact manner in which the harm occurs need not be foreseeable, the general manner of its occurrence must indeed be reasonably foreseeable.

Sea Harvest Corporation v Duncan Dock Cold Storage 2000 (1) SA 827 (SCA) at 840 B – C

[27] Although it may readily be assumed that a reasonable electrician would foresee the reasonable possibility that degradation of insulation on wires carrying live current, could injure another in his person, the outcome is not as readily apparent when the wire in question is a neutral wire and carries no current. On the facts of

this case, the foresight required of the reasonable electrician, would be of the reasonable possibility that degradation of insulation on a neutral wire, could injure another in his person by coming into contact with an un-insulated wire or conductor, carrying a live current, resulting in a fault and a subsequent flashover, or explosion.

[28] In the latter case the risk of harm to the victim is a further step removed, in the sense that there has to be reasonable foresight of the victim not only making contact with the neutral wire bearing degraded insulation, but in addition there has to be reasonable foresight that in doing so, the wire will be moved sufficiently, for it to make contact with an un-insulated wire or conductor, carrying a live current, resulting in a fault and a subsequent flashover or explosion.

[29] Although the precise or exact manner in which the neutral wire made contact with the live busbars, resulting in the flashover in the present case, need not have been reasonably foreseeable, the general manner of its occurrence must have been reasonably foreseeable. In other words, it must have been reasonably foreseeable by a reasonable electrician that the neutral wire with degraded insulation, configured as it was in the panel in question, could come into contact with the live busbars behind the busbar cover, as a result of an individual making contact with the neutral wire in the panel.

[30] As stated in Sea Harvest Corporation at 840 D

"The problem is always to decide where to draw the line, particularly in those cases where the result is readily foreseeable but not the cause. This is more likely to arise in situations where, for example, one is dealing with a genus of potential danger which is extensive, such as fire …..".

In the present case, the result of a fault, or short on the live busbars, namely a flashover, is readily foreseeable by a reasonable electrician, but not necessarily the cause, namely the neutral wire with degraded insulation making contact with the live busbars, as a consequence of the neutral wire being moved in the panel.

[31] The first issue to be examined is whether on the evidence a reasonable electrician would have foreseen the reasonable possibility, of the insulation on the neutral wire becoming degraded, to such a degree that the copper core was exposed at a point where it was able to make contact with the live busbars inside the busbar chamber.

[32] Mr. Neale stated that he had observed insulation degradation, where it became brittle, in panels such as the one in question, where they operate at high temperatures over a long period of time. Time was of the essence and it did not happen in a short time. If the insulation becomes brittle any movement of the wire cracks it, with the result that the integrity of the insulation is removed. The panels were designed to operate in a range up to 55 degrees centigrade. Above this figure he regarded as a high temperature. He stated that he had measured temperatures well in excess of that

in panels of the same design, as the one in question. When there is current flowing through the fuse holders, they are known to transmit heat and in the enclosed space of the fuse holders, the heat would gradually build up. In addition, there would be more degradation from heat, where the neutral wire made a connection to the neutral bar. This was because it was behind the fuse terminals, where there was no ventilation to take the heat away, as contrasted with the panel, where there was greater ventilation. He therefore stated that the situation may arise, where the insulation on the neutral wire in the panel would not be degraded, whereas degradation of the insulation on the neutral wire inside the busbar chamber, would have occurred, out of sight. Regard being had to the fact that the panel was in use for twenty five years this, in his view, was a long period of time. Mr. Colleton however stated that the equipment in the panel had been de-commissioned five to six years ago, and that no degradation could have taken place during this period, as there was no heat in the panel.

[33] Considering all of the above I am satisfied that a reasonable electrician would have foreseen the reasonable possibility of the insulation on the neutral wire having become degraded, particularly where the neutral wire made contact with the neutral busbar, in the vicinity of the fuse holders, which are a known source of heat.

[34] The next issue to be considered is whether on the evidence, a reasonable electrician would have foreseen the reasonable possibility of the neutral wire with degraded insulation, coming into

contact with the live busbars.

[35] This issue requires a consideration of the evidence concerning the particular configuration of the neutral wire and the manner of its attachment to the neutral busbar. Mr. Neale stated that the distance between where the neutral wire attached to the lug on the busbar, and where it fused, was less than one hundred millimetres. This indicates that the fault occurred in close proximity to where the neutral wire was attached. He stated that if the neutral wire did not have its insulation, it could have been dragged across the live phase of the busbars, causing the fault. This would obviously require tension to be applied to the neutral wire within the panel.

[36] Mr. Jones said that with hindsight and in the light of the findings made after the event, he would not work on a panel, where the neutral wire was not isolated from the fuse holders. Before the incident however, this had not been a concern to him. The position of the neutral wire was a feature of the design of the panel and all of the panels in the sub-station, had the same design.

[37] Mr. Campbell said it would have been a better design if the neutral wire had been secured closer to the busbar, so that even if it had been manipulated, it could not have moved and shorted against the busbar. There was no evidence that the neutral wire had been secured in this way, and it was not part of the design, to be secured

in this manner.

[38] Mr. Colleton confirmed that the configuration of the neutral wire was part of the design of the panel, all of the panels were the same and he had never seen anybody change the configuration of the neutral wire. He stated that the neutral wire traversed the live busbars, protected by its insulation to get to the lug, where it was attached.

[39] It is in this crucial aspect of the enquiry, namely whether a reasonable electrician would have foreseen the reasonable possibility of the neutral wire, with degraded insulation coming into contact with the live busbars, that I am mindful of the words of Scott J A in Sea Harvest Corporation at 842 F. The learned Judge of Appeal stated, that with the benefit of hindsight, that which was so remote as not to have been reasonably foreseeable, may seem otherwise. In considering what was reasonably foreseeable I must guard against "the insidious subconscious influence of *ex post facto* knowledge".

State v Mini 1963 (3) SA 188 (A) at 196 E – F

State v Bochris Investments (Pty) Ltd. & another
1988 (1) SA 861 (A) at 866 J – 867 B

Negligence is not established by showing after an event has happened, how it could have been prevented
State v Bochris *supra* at 867 A

As it was eloquently put, with respect, by Viscount Simonds in

Overseas Tankship U K Ltd.

v

Morts Dock & Engineering Co. Ltd. (The Wagon Mound)

[1961] 1 All ER 404 at 414 G – H

"After the event, even a fool is wise. But it is not the hindsight of a fool, it is the foresight of the reasonable man which alone can determine responsibility".

[40] In my view, regard being had to the fact that the configuration of the neutral wire, was determined by the design of the panels and that what would have to be foreseen by the reasonable electrician is the movement of the neutral wire, inside the panel by a third party, to a sufficient degree to cause movement of the neutral wire with degraded insulation inside the busbar chamber, causing it to come into contact with the live busbars, such an occurrence was not reasonably foreseeable.

Consequently, the defendant did not owe a duty of care to the plaintiff to service and maintain the panel in question, in such a manner that the degraded insulation on the neutral wire inside the busbar chamber, was discovered before the plaintiff carried out the specified work inside the chamber. In addition the defendant did not act negligently in the other respects alleged in the plaintiff's particulars of claim. I am fortified in reaching this conclusion by the evidence given by the qualified electricians, including the plaintiff, who did not foresee the risk of harm to the plaintiff working in the

panel, posed by the degradation of insulation of the neutral wire, inside the busbar chamber. This evidence is an indication of the general level of skill and diligence possessed by qualified electricians at the time, to which I am entitled to have regard in assessing what harm was reasonably foreseeable.

[41] In reaching this conclusion I do not overlook the evidence of Mr. van der Merwe, who was called by the plaintiff. Although, by reference to the Electrical Permit to Work (Exhibit "D4 – 6"), he criticised the risk assessment as low risk and stated that it should have been classified as high risk, simply on the basis that the panel had not been used recently and was only to be used for a modification or temporary work, he however agreed that a low RAM score was reasonable, where a person was going to work in a panel where there was supposed to be no current. He also stated that the Permit should have prescribed isolation of the panel, because of the risk, but agreed under cross-examination that the work the plaintiff had to do in the panel, meaning installation of a cable, was not unusual. He also agreed that the work that should have required isolation of the panel was the work that was reserved for the defendant's representatives, namely the connection of the cable to the fuse connectors. It should be noted in this regard that Mr. Jones observed that this connection would be done by the representatives of the defendant, because they were more familiar with the equipment and "to keep us as far away from these fuse carriers as possible", and for this reason they preferred doing it themselves. In my view, regard being had to the undisputed facts that the interior of the panel was isolated from the live current, and only the work to be

performed by the representatives of the defendant, would carry the risk of danger to live current, I do not accept his opinion that the risk assessment was too low (in the light of the knowledge possessed at the time) and that the panel including the busbars should have been isolated.

[42] In coming to this conclusion, I also do not overlook the findings and recommendations contained in the so called "incident flash" report (Exhibit "C4") nor the tripod investigation report (Exhibit "C 68 to 75 B").

[43] On the evidence it is clear that according to Mr. Campbell the "incident flash" report would come out days after the incident, containing a very quick investigation as to what happened and to warn the business of what had happened. If there were any "key learnings" they should be employed in the future. The report also contained "recommended actions". Mr. Colleton said that with regard to the "key learning" point that "even a tried and tested piece of equipment can have a potential failure mode lurking" he and the contractors did not see anything that could be "lurking", based on their prior experience of doing that work.

[44] As regards the so-called tripod investigation, Mr. Campbell who was the author of the report, stated that the object of the report was to investigate post accident and categorise the pre-conditions preceding the incident, to minimise the risk in the future. Simply

put, to find out what went wrong to prevent it from happening again. The approach was to find out what went wrong, what caused it to go wrong, how it could be prevented in the future and what should be done if the incident arose in the future. The focus was to prevent future occurrences and to put barriers in place to prevent a re-occurrence of the event. The object was not to apportion blame.

[45] In my view, the utilisation of the findings and recommendations contained in either the incident flash report, or tripod investigation report, as a basis for finding that a reasonable electrician would have foreseen a reasonable possibility of the harm arising, in the light of the evidence set out above, would be tantamount to establishing negligence, by showing after the event had occurred, how it could have been prevented. In doing so I would succumb to "the insidious subconscious influence of *ex post facto* knowledge".

[46] I did not understand Mr. Pillemer S C, who appeared for the plaintiff, to argue that even if the risk of harm complained of was not reasonably foreseeable, the defendant nevertheless owed a duty of care to the plaintiff, to properly maintain and service the panel, on the basis that the defendant was in control of a building where dangerous conditions existed. In other words an omission by the defendant "as a species of conduct" rather than "an omission (failure) to take reasonable steps to prevent foreseeable harm (as part of the test of negligence)".

Law of Delict – Neethling et al

5th Edition – pg 120

My concern arises from the allegation made by the plaintiff of a duty of care owed by the defendant to all personnel working at the sub-station and in particular the plaintiff, to ensure that the panels were properly maintained, free from any defects and hazard free. In the event however, that I have misconstrued his argument I will deal with this issue.

[47] It is clear that "the occupier of a building where dangerous conditions exist has a legal duty to prevent injury to persons who visit the premises".

Law of Delict *supra* at pg 57

[48] In the light of the factual finding I have made that the flashover was caused by the neutral wire, with degraded insulation, coming into contact with the live busbar, it is clear that a dangerous condition existed in the panel, the plaintiff was to do work in. It is clear therefore that the defendant owed a legal duty to the plaintiff to prevent injury to the plaintiff arising from the dangerous condition. If a legal duty exists, injury resulting from the omission to control the dangerous situation, is *prima facie* wrongful.

Law of Delict *supra* at pg 58

[49] In such a situation the question is whether the defendant took reasonable steps to prevent the loss. In other words, whether it

acted as a reasonable person or, on the present facts "a reasonable electrician". The answer to this question will depend, *inter alia* upon whether the defendant knew, or should reasonably have known, about the dangerous situation.

Law of Delict *supra* at pg 58 note 149 and authorities there cited

[50] On the evidence, it is clear that the defendant did not know that the insulation on the neutral wire inside the busbar chamber, in the panel in question, had degraded to the extent that its copper core was exposed. The crucial issue is whether the defendant should reasonably have known of this defect.

[51] In such a case the factual enquiry must be that in the event that the panel had been properly serviced and maintained, degradation in the insulation of the neutral wire inside the busbar chamber would have been discovered, the danger would have been appreciated, the wire would have been replaced, and the harm averted.

[52] Mr. Neale agreed that in order to properly examine the insulation on the neutral wire all the way up to the point where the neutral wire is connected to the neutral phase busbar, not only the front of the busbar chamber would have to be removed, but also the side of the busbar chamber, which would entail removing all of the

equipment in a panel, together with the fuse box cover and the fuses. This was because if only the front of the busbar chamber was removed, one would have a very limited view of the neutral wire, connecting to the neutral busbar. In either event, a complete shut-down of the sub-station would have to take place, before this procedure could be carried out. As pointed out above, he also stated that a situation could arise where the insulation of the neutral wire in the panel was not degraded, but degradation of the insulation in the neutral wire in the busbar chamber had occurred, because of the higher temperatures in the busbar chamber.

[53] Mr. Colleton said that during normal maintenance of the panels, it would not be possible to see degradation of the insulation on the neutral wire, inside the busbar chambers. He said that maintenance work in busbar chambers was done during shutdown periods, which are six to seven weeks every four to six years, because it is not permitted to open a busbar chamber, while the busbars are live. The minimum requirement was to check at least ten percent of the busbars, but they attempt to check more than that. He stated that if they found any defect in the ten percent of the busbars checked, they would approach the defendant with what they had found and they would have to open and check more of the busbars. He stated that this type of maintenance procedure was carried out on sub-station CDU2, from when he started there in 1983. After the incident they inspected all of the panels with neutral wires of the same type. In some cases this extended to the busbar chambers in sub-station CDU2, but not in the total sub-station. They found no degradation in the insulation of any of the neutral

wires and if they had, they would have recommended a complete shutdown and a full investigation of all busbar panels, where neutral wires entered them. Mr. Neale however, was of the view that the fact that the insulation on other neutral wires was found to be in order, did not suggest anything to him, because the equipment in those panels may have been totally different and generated different temperatures.

[54] What this evidence illustrates however is that it is extremely difficult to detect degradation in the insulation of the neutral wire inside the busbar chambers. To check the neutral wire insulation properly, this can only occur during a complete shutdown when the equipment in the panel can be removed and the busbar chamber fully dismantled. As pointed out by Mr. Colleton, a single day of shutdown of the sub-station has a financial cost of millions of dollars for the defendant. It is insufficient to simply check the insulation on the neutral wire in the panel, because it may differ from the insulation inside the busbar chamber. In addition, each busbar chamber has to be checked, because the temperature in each panel varies depending upon the equipment in each panel, which affects the rate of degradation of the insulation on the neutral wire.

[55] It is also clear from the evidence of Mr. Easton, that it is extremely difficult to detect heat in a busbar chamber by way of thermography, because of the presence of heat in the panel from other equipment. To measure the heat in the busbar chamber was nearly impossible. The main source of heat was the temperature

inside the panel, which affected the heat of the busbar chamber.

[56] In my view, regard being had to the practical difficulties inherent in examining the insulation of the neutral wire in each of the busbar chambers, in each panel in the sub-station which can only be carried out during a shutdown, the maintenance and inspections carried out by the defendant in this regard were reasonable. Consequently, I cannot find that the defendant could reasonably have known of the defect in the insulation of the neutral wire, inside the busbar chamber, in the panel in question. In the circumstances, the defendant took reasonable steps to prevent injury to the plaintiff and was not negligent.

[57] In the result I find that the plaintiff has failed to discharge the onus of establishing on a balance of probabilities, that the defendant and its servants, acting within the course and scope of their employment, owed a duty of care to the plaintiff on the basis alleged, nor that they acted negligently in the respects alleged, nor that they breached any duty of care owed to the plaintiff, by virtue of the defendant's control of the sub-station, where a dangerous condition existed. The plaintiff's claim must accordingly fail. In coming to this conclusion I am acutely aware of the traumatic experience the plaintiff endured, for which I have a great deal of sympathy. I however cannot allow sympathy to influence the proper decision of the case.

[58] Mr. Olsen S C, who appeared for the defendant, conceded that the defendant should be ordered to pay the wasted costs,

occasioned by the adjournment of the trial on 28 October 2009.

The order I make is the following:

a) The plaintiff's claim is dismissed.

b) The plaintiff is ordered to pay the defendant's costs, save and except for the wasted costs occasioned by the adjournment of this matter on 28 October 2009, which costs the defendant is ordered to pay.

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SWAIN J

Appearances: /

Appearances:

For the Plaintiff	**:**	Mr. M. Pillemer S C
Instructed by	**:**	Berkowitz Cohen Wartski Durban
For Defendant	**:**	Mr. P. J. Olsen S C
Instructed by	**:**	Edward Nathan Sonnenberg Durban
Date of Hearing	**:**	28 October 2010 and 16, 17, 19, 20 May 2011
Date of Filing of Judgment	**:**	17 June 2011