



Energy & Water
Ombudsman NSW

This is a determination of the Energy & Water Ombudsman NSW under Clause 6 of the Constitution of The Energy & Water Ombudsman NSW scheme.

Introduction

This determination relates to a claim by Mr and Mrs B for compensation for damage sustained to their computer, monitor and scanner.

By way of introduction I wish to note that during its seven years of operation, EWON has dealt with a large number of complaints from customers in relation to claims for damage. Overall, this has proved to be a complex and difficult area.

There appears to be no certainty for electricity suppliers or customers in relation to responsibility/liability for damage caused by electricity incidents. Although NSW electricity providers generally incorporate into their customer contracts a position of no responsibility/liability for damage caused by electricity incidents, in practice they pay many claims by customers on an ex gratia, without prejudice basis.

Electricity providers have adopted different approaches to customer claims so that there is no consistency in response across NSW utilities.

It appears that insurance companies are increasingly excluding 'electrical' incidents from their coverage, and directing policy holders back to their electricity provider for redress.

As a result of these factors, the position regarding claims for customers is not clear.

It is worth noting that the Essential Services Commission of Victoria has issued a guideline about compensation of customers. This guideline has had the effect of significantly reducing the need for the Energy & Water Ombudsman (Victoria) to be involved in customer claims for compensation.

In my view there does not appear to be any sound reason for an inconsistent approach by electricity providers in NSW to customer claims for damage. We cannot see any competitive advantage to a different approach by companies, and it does not seem equitable for customers to be treated differently in relation to claims depending on the distribution area in which they live. We have called for discussion of these issues by relevant stakeholders, including electricity distributors, regulatory bodies, and consumer groups.

In the absence of any clear guidelines for customer claims in NSW, it has been left to my office to investigate claims which have been denied by distributors. My determination in individual matters does not create any precedent, but simply reflects an attempt to resolve each case in relation to its individual circumstances.

I believe that the development of standards for claims in NSW will benefit customers, their electricity providers, and the general community.

The Complaint

Mr and Mrs B made a claim to their electricity supplier following an interruption to the electricity supply to their home between 3.15 and 5pm on Saturday 19 July 2003. The customers were not at home when supply was interrupted. Mrs B returned home first and noticed a strong smell of burning. She could not locate the source of this burning smell at first and rang her supplier's emergency line and was advised that the company would attend within the hour. Prior to this, Mr B returned home and ascertained that the burning smell was coming from their computer. They then rang their supplier and cancelled the service call.

The customers have informed EWON that their computer was plugged in and turned on at the time of the outage but was not operating. In a subsequent discussion with their neighbour, they were advised that the power went off and came back on again for a few seconds before going off again for around 30 minutes.

Mr and Mrs B submitted a claim to their supplier dated 29 July 2003 for \$1728 for a replacement PC, 15-inch monitor and a scanner. They provided a repairer's report dated 22 July 2003 in support of their claim and an itemised quotation for a replacement PC, a scanner and a 15" monitor.

In the course of our investigation, EWON clarified details of the quantum of the claim with Mr and Mrs B who confirmed that they had separately itemised the replacement cost of their damaged scanner for \$119 as they had not realised that the quote for \$1350 for the replacement PC included a Scanner. The customers had also failed to itemise on their Claim Form the \$90 they had paid to obtain the repairer's report although they had submitted a copy of the invoice for this to their supplier. The inclusion of this \$90 and the removal of the \$119 for the scanner have meant that the revised quantum of the claim is \$1699.

On 6 August 2003, the supplier wrote to Mr and Mrs B declining to pay the claim on the basis that their records did not disclose any variation in the electricity supply that did not comply with their supply standards at that time. The supplier also indicated that their policy was not to make offers of compensation in such circumstances. The customers subsequently wrote to EWON on 8 August 2003 to request a review of the reasonableness of the company's decision. In their letter, they emphasised that there was "absolutely nothing wrong" with their equipment prior to the interruption to supply on the afternoon of 19 July 2003. They also expressed their concern regarding their supplier's advice to them that "nothing unusual had happened that day". They queried that the supplier could contend this was the case and noted that they had spoken with other residents in their area who had also sent claims to the supplier for different kinds of electrical appliances that sustained damage on the same day "after the surge and blackout".

The supplier's response

The company confirmed to EWON that they stood by their denial of Mr and Mrs B's claim. On 11 August 2003 the company provided EWON with the following information in support of their decision to deny the claim.

- there was a protection operation at 4:32pm on Saturday 19 July 2003 which tripped the 11kV feeder [number] at the Zone Substation
- the protection initiated auto-reclose function operated to restore supply however the fault caused the feeder to trip again immediately
- the cause of the interruption was an overload condition that occurred when the other 33kV feeder to the Zone was opened for a live line maintenance job
- loss of supply to the 33kV feeder resulted in an interruption for 14072 customers, including the claimants, for approximately 6 minutes
- there were no other claims made by customers in the area as a result of this event.

The company emphasised that the interruption to supply was beyond their reasonable control as this was due to a protection operation on a high voltage feeder [33kV] "as a result of overload during maintenance". In their subsequent *Investigation Reports* to EWON on 2 October 2003 and 21 July 2004, the company advised that they had since received two other claims in relation to this event. The company also commented in these Reports on the circumstances regarding the shifting of load from one feeder to another, emphasising that "*the overload on the in-service feeder was not foreseeable prior to the switching*" and noting further that:

"All switching operations carried out on the network are at the discretion of and under the control of the System Operator. Assessments of the current and anticipated loads are taken into account prior to any work being carried out to minimise the impact of load. However on occasions, the actual load can exceed the anticipated load and an 'overload' condition occurs."

and,

"Loads on Zone Substations are continuously monitored at the Control Room, and the System Operator would be aware of the capacity of the system to accept the transferred load, based on the specific load readings at the time, and anticipated loadings based on statistical data."

EWON's Investigation

In the course of our investigation of this matter we considered in detail the following:

- information provided by Mr and Mrs B
- information provided by the supplier
- technical advice about the network incident from an independent electrical engineer.

Technical Advice

EWON commissioned an independent report from an experienced electrical engineer to assist in clarifying a number of technical aspects related to the supply interruption and the particular damage to Mr and Mrs B's computer and scanner. This report emphasized that there are a number of issues for consideration regarding the technical aspects of the supply incident underpinning the customers' claim. These include: the electrical loading conditions in the area; the live-line maintenance work; the actions of the System Operator; the system conditions resulting from overload and switching; and the susceptibility of domestic appliances to over-voltage. Contrary to the supplier's position that "*the overload on the in-service feeder was not foreseeable prior to the switching*", the report concludes that the supply interruption which occurred on 19 July 2003 was both within the control of the supplier and reasonably foreseeable in the circumstances. This conclusion is supported by the following detailed information.

In his report, the independent engineer noted that it is "*a matter of public record*" that electrical loading conditions in the area, and the area served by the Zone Substation in particular, "*have reached a critical stage*" due to the high rate of population growth in recent years. To address this situation, the supplier had installed one embedded generator to meet the peak demand and, according to the engineer, "*several more are scheduled – and needed – to meet the coming summer peak demand*". He concluded that:

"All this suggests that an outage of one 33 kV feeder, if it were to occur at a time at or near a period of peak demand, may result in overload of the remaining feeder, leading to complete loss of supply to the whole zone. This is in fact what happened on 19 July 2003. Thus a planned outage would need to be carefully considered (in light of loading, feeder capacity and overcurrent protection settings) and scheduled (so as to avoid peak local system demand)."

The report comments on the company's references to live line work in their *Investigation Reports* to EWON noting that:

"In common with other Australian electricity distribution network service providers, [the company] employs HV live-line work where appropriate and cost-effective. [the company's] Investigation Report dated 21 July 2004 states that "live line work does not mean that the work is carried out under normal in-service conditions The line being worked on remains energised at normal voltage, however the current is minimised for safety reasons"."

The independent engineer has indicated that this is contrary to his understanding of HV live-line work practice, emphasizing that generally, "*normal in-service conditions, including loading (current), are maintained*". Automatic reclosing circuits are, however, disabled while the work is in progress, to avoid the possibility of causing further injury or hazard should some kind of incident occur at the work site which trips the protection on the feeder.

"Minimising the current obviously substantially defeats the purpose of doing the work using 'live-line' methods, and therefore does not generally occur. It should also be noted that it is not really practicable to reduce or "minimise the current." In essence, the current is either normal load current or it is zero (neglecting a very small line

charging current). The only way to reduce or minimise the current while maintaining normal voltage is to switch it “off,” by opening the circuit breaker at the load end. (I note that [the company’s] Investigation Report dated 11 August 2003 says that: “The cause of the interruption was an overload condition that occurred when the other 33 kV feeder to the Zone was opened for a live line job.”)

The report concludes that, in general, *“the value of reducing or minimising the current – from the point of view of the work and the safety of the workers – is highly dubious, but there would undoubtedly be situations and particular tasks where switching off the load for a short period, perhaps to allow cutting and bonding of conductors without having to break or make significant current, is prudent.”* The independent engineer has indicated it is reasonable to presume that the following information describes what occurred on the feeder on 19 July 2003:

“The live-line workers communicated with the System Operator and requested that he drop load (to zero) on the feeder for a short period while they carried out some task which would otherwise be hazardous. In the normal course of events, the System Operator would have known the live line work was in progress and would maintain communication with the workers at the site”.

He has also emphasized that *“detailed analysis of dynamic system conditions on a specific network or part of a network during switching is extremely complex and that all switching operations on an alternating current network generate voltage transients”*. He suggests that this detailed analysis *“is also impossible in a practical sense and (certainly in this case) due to the lack of information about the system and its parameters”*. He notes that *“while one 33 kV feeder (the one being worked on) was switched “off” at (presumably) the [area] end, the other feeder tripped on overload, automatically reclosed, tripped again and then stayed open”*. However, in the absence of more information from the supplier, the engineer acknowledged that it is not possible to know the exact sequence of switching events when the overcurrent protection operated. Nevertheless, *“given that the protection operation was due to overcurrent, it is probable that it was the circuit breaker at the the supply end that opened, rather than the one at the Zone Substation. This would cause any resultant transient overvoltage to be impressed on the network”*. He further notes that:

- although the current in the feeder at the time it was interrupted was much less than it would have been under fault conditions, it was nonetheless substantial – obviously somewhat more than normal load current, due to the overload condition, and probably of the order of 500 – 1,000 amps, in round terms
- the feeders supplying [the area] are quite long, especially for 33 kV lines, so that the reactive component of the circuit, leading to the induction of transient voltages, is quite high. Given that there were two “open” operations and one “close” operation, there would have been three events giving rise to transient overvoltage (or surges) at the Zone Substation. These transient overvoltages could well have been of the order of eight to ten times normal voltage – and the system is designed accordingly to withstand these. The magnitude of the voltage transients would have been substantially attenuated by the zone transformers, and, further down the supply chain, by distribution transformers. Therefore the level of transient overvoltage on the low voltage distribution network would have been much less

- however, the magnitude of the (three) events was certainly not inconsequential – probably of the order of 100% or more above normal system voltage. In the absence of data about the system parameters, it is not practicable, as noted above, to calculate the level of the overvoltage.

The report also refers to the supplier's own electricity supply standard which acknowledges at clause 2.5 that the occurrence of voltage transients (due to switching) can be several times the nominal supply voltage, and states the *objective* of limiting these to less than *twice* the normal supply voltage, as supplied to customers. In his assessment the independent engineer concludes that:

“it can reasonably be presumed that in some cases, where the current being switched is high and the reactive component of the supply network is also high (both of which were the case here), [the supplier's] objective is not met, and transient overvoltages significantly greater than the level aimed at in [the company's] supply standards are impressed on customers' installations”.

In regard to the switching operations performed by the System Operator involving the Substation on 19 July 2003, the independent engineer has advised EWON that:

- the System Operator has real-time access to load data and would have been well aware of the capacity of the system to accept the transferred load when he decided to open the circuit breaker controlling the 33 kV feeder which was currently subject to live-line work
- as the System Operator must have known that the capacity to supply the load via only one 33 kV feeder was marginal, it is probable that this arrangement was for a limited period, and that the work team was under instruction (from the System Operator) to allow the feeder to be returned to normal service as soon as possible and with short notice
- because the System Operator should have known exactly the loads on the two 33 kV feeders when he did the switching, he would have been readily able to predict the resultant current once all load had been transferred to one feeder
- while the System Operator could not necessarily accurately predict the load some minutes or hours in advance, it seems reasonable to suggest that he should have been aware that the load on the zone was likely to rise in the late afternoon of a mid-winter day, especially on a Saturday. Therefore the overload condition on the second feeder was reasonably foreseeable. The System Operator should have had a reasonable idea that, with the load close to the allowable maximum (in relation to the feeder rating and over-current relay settings), problems were likely to occur if the load rose, even slightly, in the time needed to restore the network to normal.

The independent engineer has advised EWON that the above information could, if necessary, be verified by obtaining further information from the supplier, as to the actual load currents on the two feeders, the duration of the abnormal switching, and the load on the remaining feeder when the interruption occurred.

The Report notes the following information in respect of the susceptibility of electronic equipment and the specific damage to the customers' equipment:

- if the electricity network suffers a straightforward interruption, without the complications of switching transients or system faults, the supply to the appliance is simply removed, just as though the power was turned off at the switch. Thus the majority of supply interruptions do not cause damage to domestic appliances. However, where the interruption is accompanied by substantial transient overvoltage effects, as can happen and evidently did in this case, some equipment, notably computers and other electronic devices, are vulnerable
- the reported damage to the claimants' computer equipment is very much consistent with the effect of transient overvoltage – a substantial voltage surge of very short duration. The computer technician who examined the claimants' computer and associated equipment, stated in his report dated 22 July 2003 that the damage to the computer was “*consistent with a lightning strike or power surge,*” that is, a high transient overvoltage. The fact that damage occurred not only to the power supply but also to the motherboard, CPU, hard drive and other components as well as the scanner strongly suggests overvoltage as the cause
- according to Mr and Mrs B, and confirmed later in the company's *Investigation Report* to EWON dated 2 October 2003, there were other customers who sustained damage to electrical appliances at the same time as the network event under consideration. The nature of this other damage is not known, but it appears very likely that it was also caused by transient overvoltage, as this was the only abnormal occurrence on the supply system at the time.

Analysis

EWON's investigation considered the information obtained from all sources listed above. The following factors were considered particularly relevant in determining that it is reasonable for the company to address Mr and Mrs B's claim:

- the work that was carried out on the network on 19 July 2003 which resulted in the interruption to supply appears to have been within the reasonable control of the supplier. The independent technical advice commissioned by EWON indicates that the overload of the high voltage feeder that gave rise to the interruption and switching (and hence the highly probable transient overvoltage events) was both within the control of the supplier and reasonably foreseeable by them in the circumstances
- according to the independent technical advice EWON has obtained, the relationship between the failure of the customers' equipment and the apparent overload of the 33kV feeder appears to be very strong. These events appear to be linked “*by virtue of the ensuing switching operations, which almost certainly caused significant transient overvoltage events (three in quick succession), which in turn almost certainly caused the damage.*” Similarly, the failure of the customers' equipment and the protection operation were linked as the switching operations which almost certainly gave rise to the transient overvoltage events were caused by the protection operation (which appears to have been correct)

- the independent technical advice suggests that there are no other reasonable explanations for the failure of the customers' computer and scanner, in that:
 - the damage was consistent with application of transient overvoltage;
 - the damage occurred at a time coincident with the system event under consideration;
 - there were several other customers whose equipment sustained damage apparently of a similar nature at the same time; and
 - no other events or circumstances which might have caused the damage are known.

Conclusion

Given the available information, EWON is not in a position to comment further on the technical aspects of the claim. However, in a situation where there is credible technical information to support Mr and Mrs B's position, I believe it is reasonable for the benefit of any doubt to go to the customers.

Under the provision of Clause 6 of the *Constitution of the Energy & Water Ombudsman NSW* scheme I therefore determine that the company should pay the sum of \$1750.00 to Mr and Mrs B as full settlement of their claim. This amount consists of the quoted replacement costs of their equipment plus a small customer service payment acknowledging the delay that has occurred in resolving their complaint.

Under the EWON Constitution, this decision is binding on the company. Mr and Mrs B may elect within twenty-one days whether or not to accept this decision. If Mr and Mrs B accept the decision, they will fully release the supplier from all claims, actions, etc in relation to this complaint. In the event that Mr and Mrs B do not accept my decision, they may pursue their remedies in any other forum they may choose, and the company is then fully released from the decision.

Clare Petre
Energy & Water Ombudsman NSW
26 July 2005