

Case study #	1.11
Title	Noise caused by street lights
Type of trouble	Acoustic noise.
Source of trouble	Noise/EMC.
System affected	Customer's equipment.
Location	Customer premises.
Keywords	Emission/Other (arcing of relay contacts), other (solve at source).
Version date	2004-01-01

System configuration

A normal urban PSTN line, with 50-Hz-based noise present during the daytime on a number of customer lines served by the same distribution point. Initial thoughts were that the noise may be due to power equipment at a nearby industrial complex, but investigations on a weekend, when the factories were closed, still revealed the noise to be present.

Measurement/Searching techniques/Experiment

The engineer involved with solving the problem noticed that a street lamp was flickering during daylight hours, when it should have been off. The power company checked it and found the light sensor to be at fault, but after repairs the noise persisted. Further investigations revealed that the noise went off when the street lights all came on. This prompted deeper investigation with the power company. It resulted in turning off various lighting circuits in the area, and in each case the noise disappeared. Lighting load levels in the area were next investigated and found to be excessive for one particular set of circuits (the ones which had been turned off). The fault was found to be in a time-switch relay contact, which due to the overloading of the circuit was arcing continuously when the circuit was turned off, and had insufficient power to activate the lights. When the circuit was active, the relay contacts were closed, hence there was no noise. The arc noise was then coupling into the telecommunication cable.

Mitigation method/Results/Conclusion

Solve problem at source and work with power companies in tracing the problem.

References

Rec. ITU-T K.37; Annexes A and B.