

Ragnar Forshufvud, June 2012

Comments on

Report on Evaluation of Stetzer Filters

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Consumer and Clinical Radiation Protection Bureau
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These comments are purely theoretical. I have no practical experience of the Stetzer device¹.

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Item 1 of the Conclusions is correct. A large-scale use of the Stetzer device would cause problems.

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I believe – without being able to prove it – that electric “dirt” causing health problems is not harmonics, but transients. Back in the sixties, a research group at the Stockholm Technical University studied power grid transients, because silicon rectifiers, recently developed, had turned out to have a high failure rate when connected directly to the grid. I never read their report, but they told me that transients of several hundred volts peak were not unusual.

In the eighties I studied transients with a method by which I could determine their shape, but not their amplitude in volts. I used my own body as an antenna, holding in my hand a cable connected to a digital storage oscilloscope. Across the input I had connected a 1000 ohm resistor to eliminate the 50 hertz hum that would otherwise have dominated the picture. The transients were damped oscillations with frequencies of 1 – 10 MHz. I did my measurements in two office buildings, one small and one large. I noticed that frequencies above 3 megahertz were more common in the small building, probably because the cables of the electrical installation were shorter there and had higher resonance frequencies.

¹ A filter generally consists of several components, not just one capacitor. That’s why I call it the Stetzer device.

If, as I believe, transients are the main problem, and if they are in the megahertz range, one can only regret that no attempt was made to evaluate the effect of the Stetzer device on transients (item 3 of the Conclusions).

I guess that the application of a 20 microfarad capacitor between the phase and the neutral could bring down the differential-mode resonance frequency into the kilohertz range. That would cause a substantial reduction of the electromagnetic coupling between the cables and persons in the room, provided we are talking of differential-mode oscillations. Common-mode oscillations will practically remain unaffected, however.

Principally, transients should be suppressed by energy-absorbing devices as close to the source as possible. The Stetzer device may be helpful when transients are produced by devices in the house. For transients from outside, which often contain a considerable common-mode component, ferrite rings should be considered, alone or in combination with capacitors.

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The Stetzer device does not produce current noise, it just converts voltage noise into current noise. Some EHS people seem to be more sensitive to magnetic fields than to electric fields. They may experience no improvement when applying the Stetzer device – they may even feel worse. Capacitor current noise is proportional to voltage noise, but also to frequency, which explains the highly distorted view of current records. The statement between brackets in Item 2, “Stetzer current harmonics are accentuated versions of the line voltage harmonics”, is correct.

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The great advantage with the Stetzer device is that you can use it without engaging an electrician or an EMI expert. Sometimes it will work, sometimes it won't.