The Ofcom statement on PLT

Tim Williams, Elmac Services

At the end of April Ofcom, the UK regulator for the radio spectrum, released a supplement to its 2009 statement on Power Line Telecommunications (PLT). A short while earlier it had been disclosed that in 2008 Ofcom had commissioned and received a report into EMC compliance of the Comtrend PG902 power line to Ethernet modem, which was supplied by and for use with the BT Vision service. The disclosure had been mandated by the Information Commissioner's Office (ICO) after a Freedom of Information request, on the grounds of public interest. The report shows that Ofcom had been advised at the time that the Comtrend device was not in compliance with the EMC Directive's essential requirements.

The supplement describes the background to this report, and offers an explanation for Ofcom's subsequent position. It also includes several supporting documents, some of which have not been made public before. Ofcom are to be congratulated on releasing it, even if it required a persistent FoI request and review by the ICO to force it into the open. Nevertheless, the content of the supplement raises serious questions about the regulator's approach to enforcement of the EMC Directive. This article will review and discuss these questions. A summary of the issues is as follows:

- Ofcom investigated the Comtrend devices in 2008 and found, despite their own commissioned report advising differently, that there was not a breach of the EMC essential requirements. Consequently, they have not prosecuted the supplier on the grounds of placing on the market a device which was non-compliant with the EMC Directive.

- One reason for this is that they believe there is no suitable EU harmonised standard directly applicable to this type of apparatus. This is completely incorrect according to the understanding of the standards authors and users; EN 55022 is the applicable harmonised product standard. The Comtrend devices clearly exceed its limits. Ofcom's keenness to support the development within the EU of a specific PLT standard betrays their concern that standards should be used to facilitate placing products on the market, rather than to protect the radio spectrum.

- Another reason is that Comtrend had obtained a Notified Body Opinion regarding the compliance of their products, based upon withdrawn standards drafts that allowed them to pass a critical test. Because the documents have been used by a Notified Body, Ofcom believe the case for non-compliance is complex and highly technical and there is uncertainty as to when products fail to meet essential requirements.

- Ofcom did not prosecute, because they believe there was no realistic prospect of conviction and because prosecution would not be in the public interest. Essentially, the arguments are too complex for a court to consider; complaints about real world interference came, as far as they are concerned, from a single activist group of

spectrum users; and it is not in the public interest to prosecute an individual case where there is no actual public harm. They are reluctant to prosecute on the basis of the EMC Regulations, which relate to placing on the market in general. Yet they petitioned the Information Commissioner not to require publication of the report on the grounds that it could inhibit possible future prosecution.

- Stating that licensees do not have a formal legal right to "clean spectrum" appears to be a way of rowing back from any duty they may have to protect the spectrum, especially in light of future constraints on resources.

Because of its relevance to wider EMC enforcement, readers of this Journal are recommended to look at the actual statement on the Ofcom website [1]. Parts will be quoted below, but in the interests of full understanding, the whole document – it's clearly written and comprehensible – should be studied.

The Comtrend device and the ERA-RFI report

The PLT modems in question are designed for in-home use; the test report applied to two models, the older DH-10PF and the then current PG902. Independent measurements on the latter of these were the subject of an article in the EMC Journal in 2009 [4]. That article describes the function and operation of the device and so will not be repeated here.

ERA Technology specified the testing to be carried out and subcontracted RFI Global Services to do so. Both companies are of course well known and respected in the EMC test industry. The conducted emissions test results showed a similar result to that quoted in [4]; the Class B limits were exceeded by up to 39.4dB on the power lines. The Executive Summary of the report [6] stated

> *It is considered that the Ethernet Powerline Adaptors do not satisfy the essential requirements of the EMC Directive; emissions could potentially cause interference to communications equipment. This report does not consider communications services that could be affected or the range at which affects might occur.*

The report dated September 2008 was commissioned by Ofcom, according to their statement, as

> *part of the evidence gathered by Ofcom to investigate compliance with the EMC regime of two types of Comtrend Ethernet Powerline Adaptors as supplied by BT. Ofcom did not publish the report at the time as it was obtained as evidence for a criminal investigation and the premature releasing of evidence may adversely prejudice the conduct of proceedings in court.*

In other words, Ofcom were at the time contemplating taking enforcement action against Comtrend and/or BT, although this was of course not public knowledge. Yet their statement goes on to say

> *Notwithstanding this report, as explained in the September 2009 Statement, Ofcom found at the time of the investigation that there was not a breach of the EMC essential requirements.*

The statement outlines their reasons for this:

- For a prosecution to succeed Ofcom must prove beyond reasonable doubt that ... the product did not meet the essential requirements,
- Comtrend had obtained a Notified Body Opinion,
- The conclusions of the disclosed report were based on an assessment against a harmonised standard (EN55022) which is not specifically intended for PLT apparatus, and contained a "caveat" that, in essence, it didn't consider real-world situations,
- The testing and analysis is complex and highly technical. For that reason there is uncertainty as to when products fail to meet essential requirements,
- There is no suitable EU harmonised standard directly applicable to this type of apparatus.

It's helpful to know these reasons, but each of them is open to considerable question.

Applicable harmonised standard

Let's take the question of standards first. Ofcom have set considerable store by the inapplicability of EN 55022. Two of the bullet points above mention it, and the phrase "there is no suitable standard" recurs earlier in the statement; it formed part of their submission to the ICO, and it also appears in the September 2009 statement. Their position is perhaps influenced by a comment in the ERA report which says

> *There are currently no harmonised product standards that are applicable to this type of device where data is purposely transmitted onto the mains power network. The closest product standard was considered to be EN 55022 on the basis that the primary function of the device is transmission of data.*

Yet Comtrend's own declaration of conformity, as well as their Notified Body opinion, explicitly refers to EN 55022. Let's look at the declared scope of the version of that standard which was current at the time [7]: it applies to information technology equipment, defined as

> *any equipment:*
>
> *a) which has a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages and which may be equipped with one or more terminal ports typically operated for information transfer;*
>
> *b) with a rated supply voltage not exceeding 600 V.*
>
> *It includes, for example, data processing equipment, office machines, electronic business equipment and telecommunication equipment.*

It also includes a flowchart in Figure C.5 which explicitly asks “is the EUT port a telecommunication port as defined in clause 3.6?” and offers “Mains” as one of the port types. It is hard to see how a Powerline-to-Ethernet adaptor could *not* fall within this scope; and indeed the question of how CISPR 22 (the international source standard for EN 55022) *should* apply to PLT equipment was clarified at a CISPR working group meeting in September 2009. Therefore to say “there is no suitable EU harmonised standard directly applicable to this type of apparatus” is just plain wrong.

Now of course, it is entirely true that the relevant standards committee, CISPR/I in this case, has been trying for many years to create an amendment to CISPR 22 which would apply specifically to PLT apparatus. Last year it gave up the task, citing the impossibility of achieving consensus. So the European Commission pressured CENELEC (“a prompt outcome to the standardisation process would be highly appreciated by the Commission” [8]) into producing its own standard for the purpose, in the hope that the required consensus would be more readily forthcoming. “Consensus”, in this context, means that enough positive votes are cast for the standard to be published. The arithmetic of PLT supporters versus opposers is different in Europe than it is internationally, so there is the possibility that this ploy might succeed. The document, prEN 50561-1, is currently progressing through the CENELEC system, and is controversial. Until it is published and harmonised, though, EN 55022 remains valid for PLT apparatus.

Later in their statement, Ofcom say

> *Rather than focus on companies' individual products it would make sense to address the lack of harmonised standard as a priority. Ofcom could work with the Government to push for a EU resolution.*
>
> *The most appropriate means to resolve any wider problem is the development by the EU of an EMC "harmonised standard" for these products. That will give manufacturers a much clearer benchmark of what is acceptable in relation to these products.*

This emphasizes the fact that there is a fundamental dichotomy in the different parties’ understanding of the role of EMC emissions standards. CISPR (and most of the EMC community) believe that their purpose is to protect the radio spectrum. Ofcom and the EC believe that their purpose is to facilitate placing products on the market, under the New Approach Directives regime. Sometimes the purposes align; in the case of PLT, they are separated by a gulf that can only be bridged politically.

Did it or did it not meet the Essential Requirements?

Ofcom relies on the fact that Comtrend had obtained a Notified Body Opinion regarding the compliance of their products, and indeed they have published this opinion as supporting documentation, both for the PG902 and the newer PG9020 adaptors, along with their test reports. These opinions explicitly state compliance with the essential requirements via test reports to standards and a technical construction file. Although referencing EN55022:2006, the test reports make it clear that the significant conducted emissions testing was carried out to CISPR/I/89/CD in the case of the PG902 and to CISPR/I/257/CD in the case of the later

PG9020. The units passed these tests, although as was well established through the ERA-RFI report and independently, they wouldn't pass the conventional EN55022 mains conducted emissions test. Both the CD documents have been rejected in CISPR, but as discussed in [5] there has been advice to Notified Bodies that CISPR/I/257/CD may be used as the basis for assessment. That is obviously what has been done here, and Ofcom have taken it on board.

Or, to put it in their own words, "The testing and analysis is complex and highly technical. For that reason there is uncertainty as to when products fail to meet essential requirements."

In fact, in terms of laboratory practice, the testing and analysis is not at all complex. What is complex, is the decision as to *which test to apply*. That's a political decision, not a technical one.

Ofcom's approach to prosecution

The statement goes on to explain why, despite the ERA-RFI report's advice, Ofcom chose not to prosecute. Citing the Crown Prosecution Service Code, they say

> *Given that the evidence case for non compliance was not clear (and was complex) Ofcom did not consider that there was a realistic prospect of conviction. Included within that assessment is the fact that given the EMC uncertainty over the benchmark for this apparatus, the prosecutor would essentially be asking the court to determine what the acceptable level of disturbance is. A court would have test results one way and the other, and no extraneous point of reference to measure them by.*

The "realistic prospect of conviction" test is a common one in public authority enforcement – Trading Standards have used exactly the same reason to avoid pursuing other cases of non-compliance. What they are saying, in effect, is that the legal profession, clever as they are, find it very difficult to follow detailed technical arguments. Anyone who has worked as an expert witness will probably have sympathy for this view.

But Ofcom also believe that prosecution would not have been in the public interest. The first reason they give for this is that "the companies involved were doing what they could to comply with the EMC technical requirements for this apparatus". It's difficult to know what they mean by this, other than perhaps citing a Notified Body opinion. More relevant is that there "wasn't evidence of serious public harm from the use of the apparatus. There were a relatively low number of complaints (all from amateur radio users) when compared to the number of devices being used." We'll look at amateur radio users shortly. A third reason was that "BT was using other means to solve the problem. BT were sending out their engineers (for free) to fix problems as they arise. It would not seem to be in the public interest to prosecute in relation to an individual case where there is no actual public harm because the problem has been fixed." BT solved cases usually by adopting another technology such as WiFi or hard-wiring to supply the link – a tacit admission that the PLT adaptors couldn't be reconfigured to prevent the interference. We don't know whether either the user of the PLT apparatus or the victim of the interference would regard their unique problem as having been "fixed". Certainly the overarching problem – that the adapters cause interference – has not been fixed.

But the interesting point here is the question of “prosecute in relation to an individual case”, which also comes up later in the statement. That is, *not* prosecuting on the basis of the EMC Regulations, which relate to placing on the market in general. Ofcom are clearly reluctant to take any such general action, despite their mandate under the EMC Regulations to do so. The EMC Regulations do not require evidence of public harm and they make no mention of complaints being a factor in compliance. Their essential requirement (for emissions) is that the "Equipment shall be *designed and manufactured*, having regard to the state of the art, so as to ensure that ... the electromagnetic disturbance it generates does not exceed a level above which radio and telecommunications equipment or other equipment cannot operate as intended".

Yet the whole reluctance to prosecute sits oddly with Ofcom’s submission to the ICO when attempting to block release of the ERA-RFI report. From the detail of the ICO’s decision [3], we find that Ofcom argued that

> *there is however a possibility that the investigation could be reopened if new evidence was to emerge in the future. In the public authority’s view, given that mass consumer use of home PLT network devices is a relatively recent development, it is likely that new evidence could emerge in the not too distant future... the information in the report would be likely to inform suppliers of PLT devices of the approach and general consideration/strategies it undertakes when investigating possible breaches of the EMC Regulations... Specifically, disclosure would allow PLT suppliers to identify the harmonised standard against which it tests PLT devices in the absence of a harmonised standard directly applicable to PLT devices and the margin by which the public authority deems it acceptable to exceed that harmonised standard without taking enforcement action... Disclosure would also give suppliers of PLT devices a detailed understanding of the types of tests and the technical parameters used when testing these devices.*
>
> *Paras 45-49*

So on the one hand, they are unwilling to prosecute, but on the other, they are willing to reopen the investigation. It’s hardly necessary to comment on the idea that PLT suppliers could glean “detailed understanding of the types of tests and the technical parameters” only from the ERA-RFI report, given Comtrend's sophisticated manipulation of these very same aspects in their compliance statement. And note that by implication, there actually is a “margin by which the public authority deems it acceptable to exceed that harmonised standard without taking enforcement action”. On current evidence, it's 39.4dB.

Ofcom’s approach to protecting the radio spectrum

A curious part of the statement appears under the heading “No right to ‘clean’ spectrum”.

> *While the need to avoid harmful interference underpins the regime, individual wireless telegraphy licence holders are not offered a legal or practical guarantee that interference will not arise. Interference can arise from a number of sources outside the control of the licensing authority. For example, atmospheric conditions, pirate*

> *radio use and foreign overseas use all have the potential to cause interference. ... Licensees do not therefore have a formal legal right to "clean spectrum".*

This is evidently meant to be a rebuff to the radio amateurs and short wave listeners who have been in the forefront of action against PLT and who, Ofcom tell us, are responsible for the entire 272 complaints since July 2008. Bill Ray in The Register put it rather mischievously: “all the complaints came from a single lobby group so could safely be disregarded – best not band together in future, guys” [9].

So Ofcom don’t see it as their main purpose to guard the radio spectrum. And this brings us to the question of what, actually, is their purpose. Their website states that under the Communications Act 2003 one of their specific duties is “Ensuring the optimal use of the electro-magnetic spectrum”. Perhaps their interpretation of “optimal” under this clause is in fact that the spectrum, already polluted by pirates, atmospherics and foreigners, is better used by polluting PLT than by licensed radio communication and broadcasting?

But there is also another issue, which relates simply to resources. Bill Ray again [10]:

> *Ofcom has a busy year planned, involving auctions, action and investigations, not to mention taking responsibility for the Post Office too, and all for less money than last year.*
>
> *In addition to its usual duties, the regulator's plans for the next 12 months include: running the biggest spectrum auction in UK history; managing the spectrum needs of an Olympic games; reviewing the TV advertising industry; consulting on white space radio; reporting on the resilience of the country's infrastructure; and deciding how to deal with copyright infringement on the internet. And all that regulator goodness comes for less than 80 per cent of last year's budget.*

This is reinforced by the minutes of the February 2011 Spectrum Strategy Implementation Group meeting, which say “Planning for the next financial year will be difficult given the constraints on budgets and any future work is likely to be a smaller effort given these considerations” [11]. Expecting Ofcom to put effort into prosecuting PLT suppliers to protect the radio spectrum, in the face of opposition not only from the industry but from the European Commission too, appears to be asking too much.

Conclusions: whither CISPR?

It may be worth reminding ourselves of the purpose of CISPR. The first clause in CISPR’s scope [12] is

> *Standardization in the field of electromagnetic compatibility (EMC) including 1) Protection of radio reception in the range 9kHz to 400GHz from interference caused by the operation of electrical or electronic appliances and systems in the electromagnetic environment...*

For all their faults, CISPR standards are the basis of the protection of the radio spectrum. They have been accepted as representing the essential protection requirements of the EMC and R&TTE Directives through their adoption by CENELEC and the implementation of the

New Approach. If they are to have effect their application needs to be enforced under these regulations. But our own regulator clearly thinks “The testing and analysis is complex and highly technical” and consequently does not think it *can* enforce them. What confidence can we have in the regulator under these circumstances? Or perhaps we should ask: what confidence can we have in the standards?

References

[1] Ofcom statement on Power Line Telecommunications: supplement, April 2011 http://stakeholders.ofcom.org.uk/enforcement/spectrum-enforcement/plt/

[2] Ofcom September 2009 statement, http://stakeholders.ofcom.org.uk/enforcement/spectrum-enforcement/plt/september-2009-statement/

[3] Freedom of Information Act 2000 (Section 50), Environmental Information Regulations 2004 Decision Notice ref FS50301488, 23 February 2011, Information Commissioner’s Office; web link embedded in [1] above

[4] RF Emissions of Powerline Ethernet Adaptors, Tim Williams, EMC Journal No 82 May 2009 pp 15-18

[5] After the EMC Directive, Tim Williams, EMC Journal No 83 July 2009 pp 25-27

[6] EMC Evaluation of Comtrend Ethernet Powerline Adaptors, ERA Technology Ltd, September 2008, report number 2008-0578; available as “Associated Documentation” from [1] above

[7] EN55022:2006, Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

[8] Letter from Directorate General Enterprise and Industry, European Commission to Elena Santiago, CENELEC Director General, 7th May 2010; available as “Associated Documentation” from [1] above

[9] http://www.theregister.co.uk/2011/03/31/ofcom_plt/

[10] http://www.theregister.co.uk/2011/04/05/ofcom_annual_plan/

[11] SSO/SSIG(11)01, Power Line Technology Meeting 8 Feb 2011; available as “Associated Documentation” from [1] above

[12] www.iec.ch, Standards development, CISPR Dashboard, Scope

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