

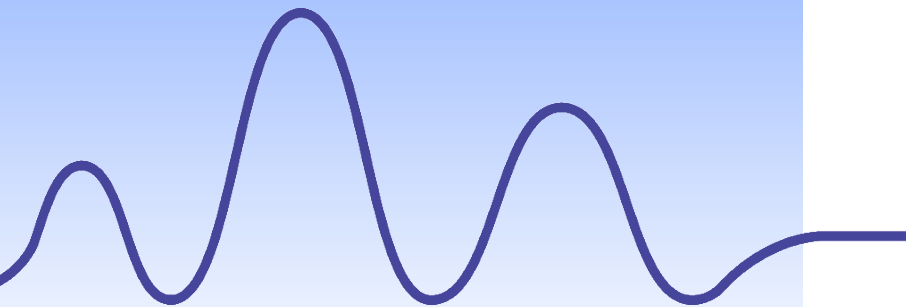
EMC and the Radio Amateur

Radio Society of Great Britain



Working for the future of Amateur Radio

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What we'll cover

- What is EMC?
- Evolving threats and the root causes
- The legal and statutory context
- The position of Ofcom, Trading Standards, EU
- What will happen if we do nothing
- What the RSGB is doing
- What we'd like YOU to do





What is EMC ?

- **ElectroMagnetic Compatability – the ability of devices to coexist and operate as intended and without mutual interference**

In short, it covers the impact on devices of other devices – and EMC standards seek to ensure that an equilibrium exists to allow peaceful coexistence



Evolving threats

- Power line telecommunications – “In House” and “Access”.
 - Notching
 - Emission limits
- LED lighting
 - Wide variability in emissions
- Solar PV
 - Wide variability in emissions
- Wireless power transfer



Evolving threats – root causes

- In short digital technology and the profit motive
- As devices become more “Efficient” the rising transients become steeper, and the range of frequencies and power for the emissions increases
- Weak market surveillance by Ofcom





The Position of Ofcom

- Charged with being the UK spectrum regulator
- Has often claimed “light touch” regulator and “evidence-based” approach to action
- Resources under severe pressure
- Too wide a remit, with mainly non-technical management
- Has some good field technical staff
- Has been slow to take powers under the WTA





Trading Standards

- A highly decentralised organisation with limited enforcement powers
- Ill-equipped to deal with technical matters
- Budget constrained
- Not staffed with technical experts
- Need a lot of evidence and “authoritative” reports
- Generally ineffective in the digital age



The legal and statutory framework



- EMC Directive 2004 and the associated UK regulations (2006). Its essential requirements state that:

“Equipment shall be so designed and manufactured, having regard to the state of the art, as to ensure that:.....the electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended;”





EMC Directive

- Is principally concerned with the placing on the market of equipment and products. It is not a spectrum management tool per se.
- Action under the Directive limited to three years after being first placed on the market.
- Joint enforcement responsibility of Ofcom and Trading Standards





WT Act

- Ofcom has powers to make Regulations to prevent interference to Radio Services
- Existing Regulations inadequate. Ofcom has not updated.....except Olympics Regulations which were not adequate as a future template
- This may explain Ofcom “walking away” from some cases of non-radio source interference





Standards

- Standards exist for most issues
- There is no obligation to adhere to a standard
- EMC Directive is prime – conformance can be shown in other ways
- Some of these ways are being abused





European Union

- Keen to leverage Europe technologically
- Takes a “for the greater good” view
- Finds the concerns of HF spectrum users tiresome
- “Radio = UHF and up”
- “HF broadcasting is dead”
- Taking a strong line to steer round the EMC Directive



What will happen if we do nothing



- Current lack of regulation on digital products
- Ofcom generally unwilling to act
- EU is arguing its way round most issues (eg Solar PVs are not “fixed installations”)
-and it will get worse
- The more producers get away with things, the more they will push the envelope



So doing nothing is not an option!



- We must create sufficient pressure on Ofcom to make a difference.
- Our input must be balanced and authoritative
- But we must have the strength of law behind us
- So.....what are we doing ?





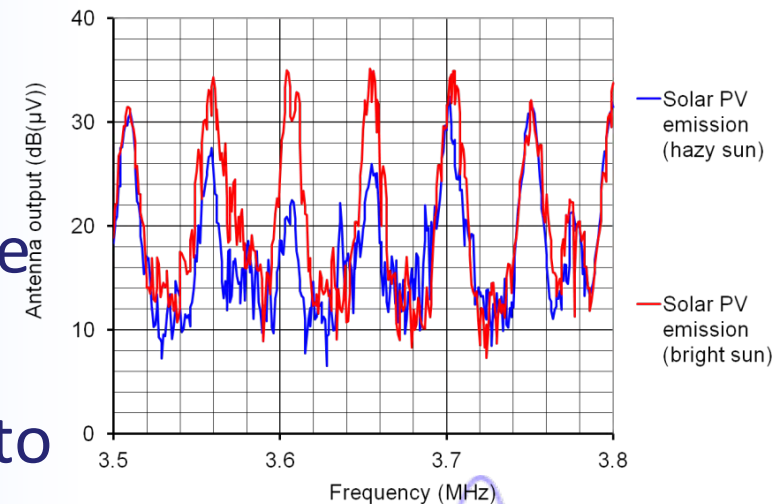
RSGB and EMC

- Playing active role in standards bodies
- Meeting with the EU
- Meetings with Ofcom
- Following up “strong” cases to prove our point
- Trying to take a balanced and responsible line
- Some examples.....



Solar PV – measurements

- Emissions on various bands mainly HF, e.g. 33dB(μ V) (S9) from amateur antenna at 3.7MHz at a distance of >80 metres from solar PV.
- 36dB above typical day time background noise on 3.7 MHz
- RFI started when ‘Optimisers’ were fitted to individual panels.
- Gathering evidence to ask Ofcom to re-open the case

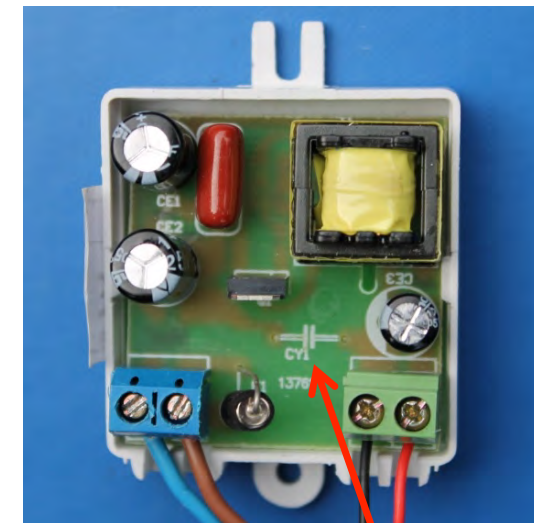


LED lighting – a case study

- Separate presentation at the Convention by G3RIR
- Tests show CE marked lights do not meet relevant standards
- Ofcom has been asked for a meeting to agree how such cases should be handled. It has replied saying “possible criminal action under consideration”
- Some interesting plots

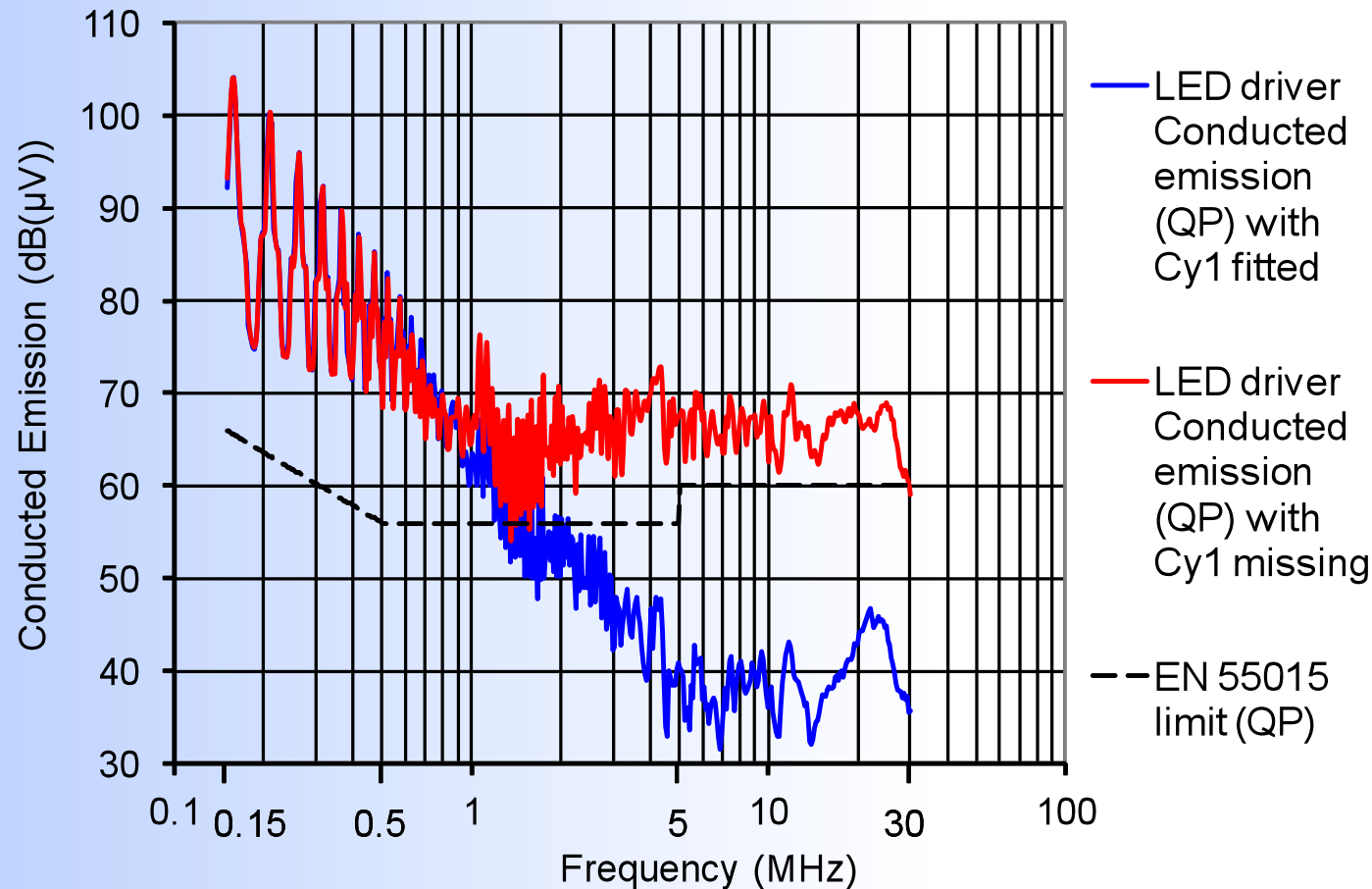


Lab testing



LED driver with missing capacitor

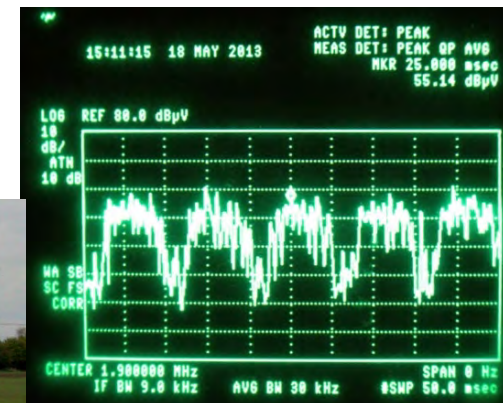
What a difference a 'cap' makes (at HF)



- Peaks at LF/MF exceed EN55015 limit by approx. 10 – 38 dB
- Missing capacitor increases HF conducted emissions by up to 30 dB

Wind farms – noise levels

- Some reports of extreme noise
- Initial tests > 2km from Tween Bridge found 55dB(μ V) or -52dBm or S9 + 21dB from amateur antenna at 1.9 MHz. Could imply field strength of ≥ 29 dB(μ V/m)
- Work under way to validate findings
- Then approach to Ofcom planned





Powerline adaptor standard

- EN50561-1 (up to 30 MHz) approved 2012
- RSGB believes it does not satisfy the EMC Directive outside the “notched” frequencies
- Has made this clear to the EU and CENELEC
- So far, it has not appeared in the OJ as a “Harmonised” Standard, but is expected to shortly.
- Some work on up to 80MHz and Access PLT which needs careful monitoring
- One manufacturer now marketing “un-notched” devices





Taking Action

- Each case results in approaches to Ofcom and others
- Getting “traction” on the issues is a challenge.
- **We need more evidence**
- This is where YOU can help





HELP US !

- Everyone should complain when noise levels rise unacceptably.
- Read the EMC leaflet (website) to check actions you need to take beforehand
- No charge from Ofcom as long as you are guilt-free
- Also, please tell the RSGB – reporting form on the web





Helping you

- EMCC limited resources
- Network of helpers/advisors – your first port of call
- EMC Committee always interested in cases and particularly where the case is strong
- We will take issues up with Ofcom



Questions ?



Working for the future of Amateur Radio

