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 Compatibility – 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(µV) (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
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(µV) or -52dBm or S9 + 21dB from amateur antenna at 1.9 MHz. Could imply field strength of >=29dB(µV/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 ?