



# Statement on the Authorisation of Short Range Devices in 870 to 876 MHz and 915 to 921 MHz

Statement

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## Section 1

# Summary

- 1.1 In December 2013 Ofcom published a consultation<sup>1</sup> setting out our technical proposals to authorise the use of a range of Short Range Devices (SRD) in the frequency bands 870-876 MHz and 915-921 MHz. In this Statement, we summarise the responses to our consultation and set out our decision to authorise the use of SRD in these frequency bands.
- 1.2 Respondents to the consultation expressed a range of views, but on balance they gave broad support to our key proposals.
- 1.3 Having considered the responses, we have concluded that we will authorise the use of SRD by licence exemption in line with the technical conditions specified in our consultation. Consequently we will exempt compliant SRD from the need to have a Wireless Telegraphy Act 2006 ('WT Act') licence.
- 1.4 We intend to publish a notice of proposals to make regulations to implement our decision to exempt compliant SRD from the need to have a WT Act licence in April 2014.
- 1.5 In addition, just under half of the responses highlighted the value of this spectrum for the *Internet of Things* and the need to provide for technologies that will require higher-power and higher duty cycle limits (Network Relay Points). We have decided that there is now sufficient evidence for us to consider a license arrangement for these devices. Our decision to do this is based on the extent of industry effort being put into the on new ETSI standards to accommodate NRPs and the demand for NRPs expressed in consultation responses.
- 1.6 We will bring forward detailed proposals for authorising higher duty cycle NRPs in a separate consultation in Q2 2014, with a view to authorising these in Q4 2014.

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<sup>1</sup> <http://stakeholders.ofcom.org.uk/consultations/short-range-devices/>

## Section 2

# Introduction

- 2.1 On 18 December 2013 we published a consultation setting out proposals to authorise the use of SRD in the 870-876 MHz and 915-921 MHz frequency bands.
- 2.2 This Statement summarises the responses to that consultation and sets out our decision to proceed with the authorisation of SRDs.

## Short Range Devices

- 2.3 Commission Decision 2006/771/EC defines SRD as “radio transmitters which provide either unidirectional or bidirectional communication and which transmit over a short distance at low power”.
- 2.4 The categories of apparatus proposed in the December 2013 consultation include; Non-Specific SRD, Networked SRD used for data acquisition, Automotive applications, RFID and Assistive listening Devices. We have proposed a set of regulations that are as application neutral as possible and will allow a diverse range of SRD to be used in the UK, including but limited to;
  - Machine-to-machine (also sometimes referred to as the Internet of Things)
  - In car and Car2Car communication
  - Smart Metering / Smart Grid
  - Alarm Systems
  - Digital Audio

## International regulatory context

- 2.5 In 2011, the European Conference of Postal and Telecommunications Administrations (CEPT) initiated work on the development of a European technical and regulatory framework for SRD in the frequency bands 870-876 MHz and 915-921 MHz. Following the conclusion of this work, the CEPT Electronic Communications Committee (ECC) published ECC Report 189<sup>2</sup>, ECC Report 200<sup>3</sup> and a revision of the European Recommendation for SRD, ERC Rec 70-03<sup>4</sup> in February 2014. The material contained in the ERC Recommendation 70-03 is based on the studies contained in ECC Report 189.
- 2.6 In parallel to the CEPT work, the European Telecommunications Standards Institute (ETSI) are developing the harmonised standards:

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<sup>2</sup> <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP189.PDF>

<sup>3</sup> <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP200.PDF>

<sup>4</sup> <http://www.erodocdb.dk/docs/doc98/official/pdf/rec7003e.pdf>

- Revision of the Non-Specific SRD EN 300 220
  - Development of EN 303 131 for high reliability SRD (e.g. Alarms) in the low duty cycle allocations.
  - Development of EN 303 204 for Network Based SRD 870-876 MHz, (including Network Relay Points (NRP))
- 2.7 Ofcom, representing the UK, has played a significant role in the CEPT work and in the development of the ECC Report 189 to ensure that the range of SRDs facilitated is as application neutral as possible, while maintaining the technical regulations necessary to ensure that the spectrum is used efficiently. Ofcom is of the opinion that the resulting European recommendation fulfils the principles for deployment of SRD as set out in the UK Licence Exempt Framework Review (LEFR), the CEPT Report 14 strategy for SRD and the RSPGs opinion on the Collective Use of Spectrum (CUS).
- 2.8 It may be desirable for the CEPT work on 870-876 MHz and 915-921 MHz SRD to apply more widely. For example, to promote a larger European market, which is likely to lead to lower equipment costs. Ofcom is therefore supportive of the guidance<sup>5</sup> from the Commission, in the 6<sup>th</sup> update of EC Decision 2006/771/EC, to consider the mandatory harmonisation of these SRD regulations.

## Our consultation

- 2.9 In our December 2013 consultation, we set out specific proposals for authorising the use of SRD in the frequency bands 870-876 MHz and 915-921 MHz.
- 2.10 We have consulted on a range of technical parameters, based on the evidence compiled in ECC Report 189 and ECC Report 200, that best match the way in which the UK uses and plans to use the bands 870-876 MHz and 915-921 MHz. National uses that the UK government has identified and that we have taken into account include:
- existing Wind Profiling Radar,
  - a Home Office system and
  - railway signalling infrastructure (E-GSM-R), should the UK government decide to deploy this in the future.
- 2.11 In the consultation we asked one specific question:
- Do you agree that regulations should be made to enable the licence exempt use of SRDs in the 870 to 876 MHz and 915 to 921 MHz frequency bands, in line with the amendment of ERC Recommendation 70-03?*
- 2.12 We received 21 responses to the consultation from a variety of stakeholders including, but not limited to:
- The SRD manufacturing industry,

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<sup>5</sup> <http://ec.europa.eu/digital-agenda/en/radio-spectrum-committee-rsc>

- operators of SRD,
- Mobile operators (NMO),
- trade associations and
- government agencies.

One of the responses we received was submitted to us on a confidential basis. The 20 non-confidential responses can be found on our website<sup>6</sup> and the names of those respondents are listed in Annex 1 of this document.

## Legal framework

- 2.13 The applicable legal framework derives from our duties under both European and domestic legislation, specifically from:
- the Common Regulatory Framework for electronic communications networks and services, in particular, the Framework Directive and the Authorisation Directive; and
  - the Communications Act 2003 (the “Communications Act”) and the WT Act which transpose the provisions of those directives into national law.

## Our general duties

- 2.14 Section 3(1) of the Communications Act provides that our principal duties in carrying out our functions are:
- to further the interests of citizens in relation to communications matters; and
  - to further the interests of consumers in relevant markets, where appropriate by promoting competition.
- 2.15 In carrying out these duties, we are required, among other things, to have regard to a number of matters such as the desirability of promoting competition, investment and innovation<sup>7</sup>. Ofcom is also required to have regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed<sup>8</sup>.
- 2.16 Section 4 of the Communications Act requires Ofcom to act in accordance with the six Community requirements, which give effect to the requirements of Article 8 of the Framework Directive.

## Our spectrum duties

- 2.17 In carrying out our functions, we are required under the Communications Act to secure, in particular, the optimal use of the electromagnetic spectrum for wireless

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<sup>6</sup> <http://stakeholders.ofcom.org.uk/consultations/short-range-devices/>

<sup>7</sup> Sections 3(4)(b) and (d) Communications Act 2003

<sup>8</sup> Section 3(3) Communications Act 2003

telegraphy<sup>9</sup>, and to have regard to the different needs and interests of all persons who may wish to make use of the spectrum for wireless telegraphy<sup>10</sup>.

2.18 In addition, in carrying out our spectrum functions under section 3(1) of the WT Act, we are required to have regard in particular to:

- the extent to which the electromagnetic spectrum is available for use, or further use, for wireless telegraphy;
- the demand for use of the spectrum for wireless telegraphy; and
- the demand that is likely to arise in future for the use of spectrum for wireless telegraphy.

2.19 Section 3(2) of the WT Act provides that Ofcom must also have regard to the desirability of promoting the efficient management and use of the spectrum for wireless telegraphy, the economic and other benefits that may arise from the use of wireless telegraphy, and the development of innovative services and competition in the provision of electronic communications services.

### **Wireless telegraphy licences and licence exemption regulations**

2.20 Under section 8(1) of the WT Act, it is an offence to establish, install or use wireless telegraphy ('WT') equipment in the UK except where such use is authorised either by the issue of an appropriate wireless telegraphy licence or where the use of such equipment is exempted from the need to hold such a licence by regulations made under section 8(3) of the WT Act. Section 8(4) of the WT Act requires that Ofcom must make regulations to exempt the use of WT equipment if the conditions in section 8(5) of the WT Act are met, including that the use of the equipment is not likely to involve undue interference. By way of section 119 of the WT Act, the requirement for Ofcom's authorisation extends to the use of radio apparatus on UK-registered ships and aircraft.

2.21 We aim wherever possible to reduce the regulatory burden upon our stakeholders (in this instance users of radio spectrum) and one way we can do this is, when appropriate, to exempt from licensing the use of specified equipment which is unlikely to cause undue interference to other legitimate users of the radio spectrum.

2.22 Whether the radio equipment is licensed or licence-exempt, UK regulations will normally refer to an Interface Requirement ('IR') which sets out the appropriate technical operational conformity requirements. The IR normally includes a cross-reference to any appropriate ETSI standard.

2.23 Section 9 of the WT Act gives us the power to grant wireless telegraphy licences subject to such terms as we think fit. Schedule 1(6) of the WT Act gives Ofcom a general discretion to vary wireless telegraphy licences and sets out the process that Ofcom must follow. In the case where a variation is proposed by the licensee, we are under no obligation (under the WT Act) to consult on the proposal.

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<sup>9</sup> Section 3(2)(a) Communications Act 2003

<sup>10</sup> Section 3(4)(f) Communications Act 2003

## Radio and Telecommunications Terminal Equipment

- 2.24 Most radio equipment must be compliant with the Radio and Telecommunications Terminal Equipment (R&TTE) Directive (Directive 99/5/EC) to reduce the risk of harmful interference. The R&TTE Directive has been implemented into UK law by the Radio Equipment and Telecommunications Terminal Equipment Regulations 2000 (SI 2000/730) as amended. Compliance with the relevant ETSI harmonised standard (where there is one which has been endorsed as a 'harmonised standard' by the European Commission<sup>11</sup>) presumes that the equipment conforms with the essential requirements of the R&TTE Directive and the use of these standards has proved a popular method for manufacturers and suppliers to ensure compliance.
- 2.25 Interface requirements (IRs) for radio equipment provide a link between the requirements of the R&TTE Directive and the use of national radio spectrum. UK IRs describe the minimum technical specifications, such as power limits and frequency bands, which are necessary to avoid interference between services.

## Structure of this document

- 2.26 The remainder of this document is structured as follows:
- Section 3 – Summary of the responses to our consultation together with Ofcom's assessment
  - Section 4 – Summary of Ofcom's decision
  - Annex 1 – List of respondents
  - Annex 2 – Revised draft Interface Requirement

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<sup>11</sup> See [http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/rte/index\\_en.htm](http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/rte/index_en.htm)



## Section 3

# Review of Responses

## Overview

- 3.1 We received 21 responses to the consultation from a variety of stakeholders including, but not limited to: The SRD manufacturing industry, operators of SRD, Mobile operators (NMO), trade associations and government agencies. One of the responses we received was submitted to us on a confidential basis. The 20 non-confidential responses can be found on our website<sup>12</sup> and the names of those respondents are listed in Annex 1 of this document.
- 3.2 Overall, there was broad support for authorising the use of SRD in the 870-876 MHz and 915-921 MHz frequency bands. Given the nature of the responses to the consultation and the range of issues raised, our consideration of them is set out in the following sub-sections:
- Higher Duty Cycle Network Relay Points (NRP)
  - Protection of proposed rail infrastructure (E-GSM-R)
  - Wind Profiler Radar
  - Unwanted emission limits
  - Further liberalisation of bandwidth limits

## Summary of responses

### Higher Duty Cycle Network Relay Points (NRP)

- 3.3 Of the 21 responses to the consultation:
- Ten responses, whilst supporting the principle of allowing the use of SRD in the 870-876 MHz and 915-921 MHz frequency bands, went further in suggesting that Ofcom should additionally consider the authorisation of higher duty cycle NRP, up to the limit of 10%.
  - One of those ten made two additional suggestions. They suggested relaxed duty cycle at night time and they suggested a technical solution (Listen Before Talk (LBT) with Clear Channel Assessment (CCA)) as an alternative to licensing.
  - The same response also noted that the nearly complete equipment standard [EN 303 204] employed a CCA (Clear Channel Assessment) mechanism that would cause such devices to 'back off' on the presence of traffic on any given channel. Further, Short Control Signalling Transmissions are also being incorporated to promote good sharing properties and to support future regulations which could require more adaptive device behaviour.

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<sup>12</sup> <http://stakeholders.ofcom.org.uk/consultations/short-range-devices/>

## Ofcom response

- 3.4 The ECC Report 189, ECC Report 200, and a revision of the European Recommendation for SRD, ERC Rec 70-03, suggest that for general authorisation by licence exemption, the limit on duty cycle for NRP should be limited to 2.5%.
- 3.5 The same CEPT deliverables also make it clear that *“a duty cycle of up to 10% may be allowed for network relay points forming part of metropolitan/rural area networks such as for utilities or other applications for the purpose of data acquisition. Network relay points should be individually licensed”*
- 3.6 As a consequence, in our December consultation we made proposals for NRP to have a 2.5% duty cycle in 870-873 MHz (the 873-876 MHz being constrained by the need to protect E-GSM-R) and noted that higher duty NRPs would require individual licensing or light licensing to prevent harmful interference to other spectrum users. Consequently we did not propose exempting these higher duty NRP devices from licensing, but said that we would review whether we should permit them should evidence of demand for these support this.
- 3.7 The authorisation of NRPs able to operate up to 2.5 % duty cycle will enable networks to be rolled out. However, we understand that there remains the opportunity to reduce the number of NRP in a network if the duty cycle is permitted to increase to 10%. This may reduce the costs of deploying such networks.
- 3.8 We have considered the demand for these higher duty cycle NRPs and decided that there is now sufficient evidence for us to consider a license arrangement for these devices. This is based on the extent of industry effort being put into the new ETSI standards to accommodate NRPs and the demand for NRPs expressed in consultation responses.
- 3.9 Ofcom will therefore bring forward proposals to introduce a licensing regime to accommodate higher Duty Cycle (10%) NRPs used in networks in the band 870-873 MHz, in line with the ERC Rec 70-03 recommendation.
- 3.10 Ofcom is also keen to promote the development of a technical solution that can allow the polite sharing of higher duty cycle NRPs and to see the development of standards that support this. Ofcom would welcome further consideration of Recommendation 70-03 if a technical solution for polite sharing, such as CCA embedded in higher duty cycle NRPs, to be found to provide the necessary mitigation from interference to other SRD.
- 3.11 In respect of the further suggestion for altering the permitted duty cycle at different times of day, Ofcom may consider further research undertaken in ETSI/CEPT that demonstrates how this can be implemented whilst protecting other uses and users from undue interference.

## **Protection of proposed rail infrastructure (E-GSM-R)**

- 3.12 One response suggested that Ofcom removed the blanket restrictions necessary to protect rail infrastructure (E-GSM-R). They suggested that coordination with the rail industry may be more appropriate. Another response seeks clarification of the necessary protection for E-GSM-R.

### Ofcom response

- 3.13 Ofcom recognises that the blanket and nationwide restrictions to protect E-GSM-R are conservative and should not be necessary where there is sufficient geographic separation between SRDs, including Smart Metering, and rail infrastructure.
- 3.14 However, it is difficult to reverse the effect of free circulation and use of apparatus since any licence exempt mass-market device may be installed without restriction on location. e.g., a train customer may carry an SRD on-board an E-GSM-R enabled train. Until such time as there is greater clarity on whether E-GSM-R is likely to be deployed or not, Ofcom considers it inappropriate to make proposals for more permissive use of SRD in the 873-876 MHz and 918-921 MHz frequency bands; and particularly in respect of NRPs requiring higher power and duty cycle limits.
- 3.15 Over time, as greater clarity as to any deployment of E-GSM-R becomes known, Ofcom may make revised proposals to allow the more permissive use of SRD, where they are unlikely to cause undue harm to rail infrastructure.

### **Protection of Wind Profiler Radar (WPR)**

- 3.16 The Meteorological Office (Met Office) response was concerned with the interference risk to WPR. In their response the Met Office made it clear that lawfully authorised SRD, including RFID, must not cause harmful interference. The response was however questioning of Ofcom's will and ability to adequately enforce, whenever harmful interference occurred.

### Ofcom response

- 3.17 Ofcom shares the concern of the Met Office and understands that harmful interference can cause disruption to meteorological forecasting. We are working with the Met Office to revise our Memorandum of Understanding on enforcement accordingly.

### **Unwanted emission limits**

- 3.18 One response was concerned about spurious emissions into television receivers operating in the frequency band below 862 MHz.
- 3.19 Another two responses supported the introduction of SRD in the 873-876 MHz and 918-921 MHz frequency bands, but suggested that when an SRD is mounted on a mast alongside a mobile phone base-station, the spurious emissions from the SRDs be constrained further than for general SRD.

### Ofcom response

- 3.20 The recommendation ERC Rec 74-01<sup>13</sup> sets out the unwanted emissions in the spurious domain. The Table 2.1 of this recommendation sets out these limits for SRDs. Based on the MoU between CEPT and ETSI, these limits are carried across into the equipment standards for SRDs. Ofcom is therefore satisfied that the spurious emissions into TV receivers operating below 862 MHz are sufficiently small from SRDs operating above 870 MHz, so as not to cause harmful interference.

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<sup>13</sup> <http://www.erodocdb.dk/Docs/doc98/official/pdf/REC7401E.PDF>

- 3.21 Ofcom recognises that the owners of base stations or any other private facilities have the option to either prevent the installation of certain apparatus or to specify the types of apparatus that can be used within their property. If the owner of a base station wishes to specify enhanced spurious emission limits for any apparatus fixed to a mast within its private facility, they may do so. If a base station owner believed it necessary to develop parameters for a unique set of co-located apparatus, they have the opportunity to request ETSI to open a work item for this class of apparatus.

### **Further liberalisation of bandwidth limits**

- 3.22 One response supported the principle of allowing the use of SRD in the 870-876 MHz and 915-921 MHz frequency bands, but questioned the limitation to 600 kHz bandwidth and low duty cycle. They did however note Ofcom's support of the New work item in ETSI to review these restrictions.

### **Ofcom response**

- 3.23 The original five Systems Reference Documents (SRDoc) sent to CEPT suggesting the use of SRD in the 870-876 MHz and 915-921 MHz frequency bands, have a maximum suggested bandwidth of 600 kHz. Therefore this is what has been studied in CEPT and the basis for CEPT's recommendation.
- 3.24 Subsequently and following the intervention of Qualcomm in CEPT WGFM, ETSI have been requested to develop a further SRDoc to study the possibility for wider bandwidths and relaxed duty cycle limitations. Ofcom supports the development of least restrictive regulations, where it can be demonstrated this leads to the efficient use of spectrum and there is sufficient protection from undue interference to other radiocommunications.
- 3.25 Ofcom looks forward to this study being completed and to subsequent proposals for liberalisation of the parameters that can be justified.

## Section 4

# Ofcom Decision

- 4.1 Having considered the responses to our consultation, we have decided to proceed with the authorisation of SRD in the 870-876 MHz and 915-921 MHz frequency bands by licence exemption to the sets of technical parameters set out in our December 2013 consultation.
- 4.2 We intend to publish a notice of proposals to make regulations to implement our decision to exempt SRD, in the 870-876 MHz and 915-921 MHz frequency bands, from the need to have a WT Act licence, in April 2014. We expect the regulations covering the exemption from licensing for SRD in the 870-876 MHz and 915-921 MHz frequency bands to be in force by 1 July 2014.
- 4.3 Further, we will bring forward detailed proposals for authorising higher duty cycle NRPs in a separate consultation in Q2 2014, with a view to authorising these in Q4 2014.

## Annex 1

# List of Respondents

A1.1 Ofcom received 21 responses to the December 2013 consultation, one of which was submitted to us on a confidential basis. The 20 non-confidential responses can be found on our website<sup>14</sup>. A list of the 20 non-confidential respondents is shown below.

## Non-confidential Responses

JP Gulliver

HS2

ETSI ERM TG34

ARM

LPRA

Tyco

Name withheld

SCF

IEEE 802 LAN/MAN

Wi-Sun Alliance

SSN

Vodafone

Bosch

Met office

Analogue Devices

Qualcomm

ZigBee Alliance

Energy (UK)

Tech UK (was Intellect)

JRC

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<sup>14</sup> <http://stakeholders.ofcom.org.uk/consultations/short-range-devices/>

## Annex 2

# Revised Draft Interface Requirement

The draft revision to IR2030 can be found at

[http://stakeholders.ofcom.org.uk/spectrum/technical/interface-requirements/draft\\_ir/](http://stakeholders.ofcom.org.uk/spectrum/technical/interface-requirements/draft_ir/)