



Commission for
Communications Regulation

SPECTRUM INTELLIGENCE & INVESTIGATIONS

ANNUAL REPORT

2018 – 2019



SPECTRUM INTELLIGENCE & INVESTIGATIONS ANNUAL REPORT

**Annual Report for the period
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1. INTRODUCTION



The Commission for Communications Regulation (“ComReg”) is the statutory body responsible for the regulation of the electronic communications (telecommunications, radio communications and broadcasting networks), postal and premium rate sectors in Ireland in accordance with European Union (“EU”) and Irish law. ComReg also manages Ireland’s radio frequency spectrum (“radio spectrum” or “spectrum”) and the national numbering resource.

Radio spectrum is the medium by which information may be transmitted wirelessly over distances ranging from a few metres to thousands of kilometres. It is a valuable national resource as it underpins nearly all communications services in the State. These services include mobile and fixed telephony and broadband, radio and television broadcasting, and radio communications used by commercial business and by air and maritime transport. Radio spectrum is also fundamental in the day-to-day operation of the emergency services and defence forces and is a vital input to many other services including important scientific applications, such as weather forecasting and monitoring the Earth’s environment and by the emergency services.

Radio spectrum is thus integral to the ongoing economic and social well-being of the State. The wireless communications sector is estimated to account for approximately 17,000 full time equivalent Irish jobs and spectrum-dependent activities are estimated to contribute €6.2 billion to the economy, which is 3.5% of Irish Gross National Income¹. However, radio spectrum is also a finite resource, with competing uses and users, and so it must be used effectively and efficiently.



Spectrum Intelligence & Investigations (SII), sitting within ComReg’s Market Framework Division, is responsible for ensuring the integrity of the spectrum resource.

¹ See section 3.2.1 of ComReg doc. 18/18, Radio Spectrum Management Strategy Statement 2019 to 2021.

Optimised use of radio spectrum depends on proper management of that resource to ensure, amongst other things, that radio communications systems can operate with minimum interference². These systems depend on clear radio channels in order to operate effectively noting that, in some cases, clear and reliable communications are critical to protecting life, health, and property.

ComReg, acting within its legislative remit and its budgetary and staff resources, seeks to ensure that all lawful wireless services and devices in the State are free of interference. Annex 1 of ComReg Doc 18/118³ sets out the key statutory provisions under which ComReg manages the radio spectrum resource.

Spectrum Intelligence & Investigations (SII), sitting within ComReg’s Market Framework Division, is responsible for ensuring the integrity of the spectrum resource. Within SII, work is divided into four work streams:

- Market surveillance of products;
- Radio frequency interference investigations;
- Radio spectrum monitoring; and
- Compliance and enforcement.

The remainder of this report is structured as follows:

- **Chapter 2** covers market surveillance of radio communications products for the reporting period and plans to July 2020;
- **Chapter 3** focuses on radio frequency interference investigations in the reporting period and plans to July 2020;
- **Chapter 4** reports on radio spectrum monitoring activities and non-ionising radiation measurements in the reporting period and plans to July 2020;
- **Chapter 5** provides information on compliance and enforcement actions supporting the activities detailed in chapters 2 – 4; and
- **Annex 1** sets out a summary of the legal framework.

² The radio spectrum needs to be managed because two or more radio signals operating simultaneously and in the same location can interfere with each other reducing the ability of the radio spectrum to operate effectively. It is not possible for users to share spectrum indiscriminately because one user may cause interference for another user.

³ ComReg18/118 – Radio Spectrum Management Strategy Statement 2019 to 2021 – published 20/12/2018.

2. MARKET SURVEILLANCE OF PRODUCTS



A pillar of the EU is free movement of goods across Member States' national borders without undue restrictions. To support this principle, all products produced in, or imported into, the EU must meet certain defined and harmonised standards. This includes all devices that utilise radio spectrum. The standards which apply to such devices are of a technical and administrative nature. Their core purpose is to ensure that the integrity of the radio spectrum resource is maintained and to prevent harmful interference.

The purpose of market surveillance is to prevent non-compliant products from entering the market, anywhere in the EU, and to seek out and remove non-compliant products which have entered the market.

Two primary sources of legalisation cover market surveillance of wireless devices that utilise radio spectrum - the Electromagnetic Compatibility Directive (EMCD) and the Radio Equipment Directive (RED). ComReg is mandated under EU Regulation 765/2008 to conduct market surveillance under these two Directives - see Annex 1 for further details.

In its 2017-2018 Annual Report⁴ SII identified the likely benefits of more technical and administrative checks on wireless devices placed on the Irish market, to ensure their compliance with EU harmonised standards. This chapter details how this was achieved.



Stakeholder relationships are important in aiding SII to create awareness of stakeholders' obligations and to have direct contact with key personnel involved in policy making and government relations.

PROACTIVE PROJECTS

SII undertook four main market surveillance projects during this review period:

- Engaged with new stakeholders, following stakeholder analysis;
- Developed existing relationship with Customs & Excise;
- Participated in a targeted EU market surveillance campaign; and
- Engaged with online trading platforms in order to:
 - identify and remove from the online platforms any advertisements promoting the sale of non-compliant devices;
 - intercept and remove from the market, by targeting the source, devices that have the potential to cause interference and disruption to other users; and
 - identify where stocks of non-compliant devices are held in Ireland for further action to be taken.

ENGAGING WITH STAKEHOLDERS

In addition to maintaining current relationships SII has also identified and has sought to build relationships with new stakeholders, in order to optimise and develop the performance of its market surveillance function. These relationships are important in aiding SII to create awareness of stakeholders' obligations and to have direct contact with key personnel involved in policy making and government relations.

Other Regulators

Each EU Member State is required to appoint a National Regulatory Authority (NRA) for its electronic communications sector, with ComReg being the NRA for Ireland. NRAs communicate and work with one another to share knowledge, information and experiences on areas of common interest. ComReg, in this period, engaged with the NRAs of the Netherlands and the United Kingdom who are respected for their detailed and innovative work in the area of products and device market surveillance.

⁴ ComReg 18/86, Spectrum Intelligence & Investigations: Annual Report 2017-2018, published 29 September 2018.

In January 2019, SII visited the Netherlands NRA, Agentschap Telecom⁵, whose staff shared strategies and ideas and demonstrated new radio monitoring equipment. In February 2019, SII visited the Birmingham facilities of Ofcom⁶, again to share strategies and to identify areas for improvement in desktop market surveillance and field work. The purpose of this visit was also to establish close working relationships that will be necessary when or if Brexit occurs. A follow-up meeting was held in Dublin, to address the particular issue of Brexit.

The European Union

Under the auspices of the EU and in relation to the EMCD and RED a number of Administrative Cooperation Groups (AdCos) and Working Group Parties have been established. Members of these groups are appointed by Member States and represent national authorities responsible for market surveillance in given sectors. Meetings are held approximately five times each year to discuss market surveillance issues and to ensure efficient, comprehensive and consistent market surveillance across the Union.

Staff of SII attend the most relevant of these meetings, where time and resources permit. SII staff also submit details of non-compliant products found on the Irish market to shared databases like RAPEX⁷ (Rapid Alert System for Non-Food Consumer Products (EU)) and ICMS⁸ (Information & Communications System for Market Surveillance) in order to disseminate information on non-compliant products across the EU.

National Market Surveillance Forum

The Department of Business, Enterprise and Innovation has established a National Market Surveillance Forum⁹

5 Agentschap Telecom falls under the Ministry of Economic Affairs and Climate – see www.agentschaptelecom.nl/radiocommunications-agency

6 See www.ofcom.org.uk

7 RAPEX is an EU-wide rapid information exchange system for products (except food, pharmaceutical and medical devices) found to pose a serious health and/or safety risk. The list of products is updated by the European Union weekly and previously issued alerts may also be viewed. See ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/repository/content/pages/rapex/index_en.htm

8 The Information and Communication System on Market Surveillance (ICMS) is an IT platform to facilitate communication between market surveillance bodies in the EU and in EFTA countries. It quickly and efficiently shares information on non-compliant products, avoids the duplication of work, and speeds up the removal of unsafe products from the market. See webgate.ec.europa.eu/icsms/

9 See dbei.gov.ie/en/Publications/National-Sector-Specific-Market-Surveillance-Programme.html

to bring together all market surveillance authorities in Ireland, across all sectors. This broad and diverse forum includes ComReg, with regard to the RED and EMCD.

Each quarterly meeting of the forum has proven to be valuable as, while interests are diverse, market surveillance authorities tend to operate under similar principles and legal powers and encounter similar difficulties and obstructions.

e-Commerce: online trading platforms

Online eCommerce¹⁰ continues to grow and with it the importance of monitoring the online sale of products into Ireland, to ensure their compliance with the EMCD and RED.

During the reporting period ComReg has established working relationships with major online platforms such as Facebook, Google, and DoneDeal in order to prevent non-compliant radio and electronic equipment from being imported into Ireland through their websites. A nominated contact for each platform has authority to assist ComReg with immediate and urgent matters. There are many positive benefits to building these relationships. SII has a direct line to policy makers in many organisations. Through joint co-operation with these contacts SII has been able to identify a number of resellers of illegal equipment (e.g. GPS trackers and mobile boosters) that were subsequently taken down by the relevant platforms, thus preventing illegal equipment reaching the market.

WORKING WITH CUSTOMS & EXCISE

A mutually beneficial working relationship has been established with Customs & Excise at the Dublin, Portlaoise, and Athlone mail centres. ComReg has provided Customs & Excise with a list of non-compliant or potentially non-compliant devices to inspect if someone is attempting to import them into Ireland. These include mobile phone boosters, Wi-Fi repeaters, GPS trackers, radar detectors, and signal jammers.

Since July 2018, 283 such devices have been seized by Customs & Excise at its various mail centres and have been handed over to ComReg. About 80% were found

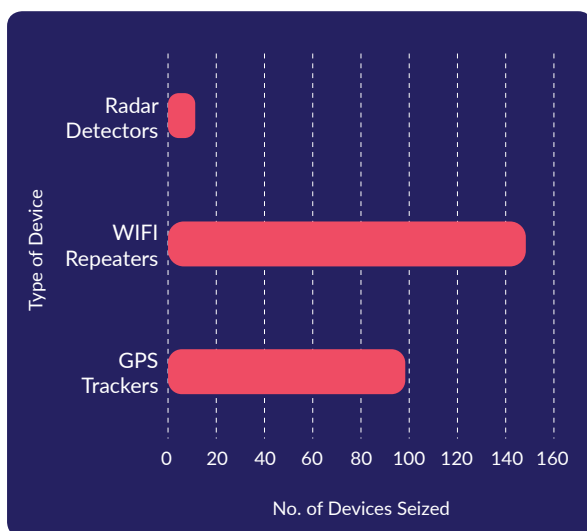
10 There are currently 2.89 million eCommerce users in Ireland, with an additional 460,000 users expected to be shopping online by 2022. Four years from now, these 3.35 million eCommerce users will spend an average of circa € 1 500 online each year. See www.eshopworld.com/blog/ireland-ecommerce-insights-2018/

to be non-compliant with the RED and/or EMC. This is a 66% increase on the previous reporting period, when 170 devices were seized. Figure 1 provides a breakdown of some of the non-compliant items seized.

Wi-Fi repeaters

The use of licence-exempt Wi-Fi repeaters rely upon a sharing protocol and devices with low output power characteristics. Non-compliant Wi-Fi repeaters operate at far higher power than that permitted by the harmonised standard¹¹. This undermines the sharing protocol and causes interference to compliant repeaters. There has been an increase in the purchase of non-compliant Wi-Fi repeaters. ComReg has seized over 145 of them in this reporting period. See Figure 1.

Figure 1. Breakdown of some of the items seized with the assistance of Customs & Excise 2018 - 2019



TARGETED EU MARKET SURVEILLANCE CAMPAIGN ON IOT DEVICES

In the reporting period, AdCo members launched a market surveillance campaign on the Internet of Things (IoT). As IoT covers many products AdCo resolved to concentrate on household appliances that include connectivity. The 10th joint cross-border EMC market surveillance campaign took place between January and June 2019 and the final report is expected to be

11 See EN 301 908-10 V4.2.2 source: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=uriserv:OJ.C_.2018.326.01.0114.01.
ENG Official Journal of the European Union

presented at the next RED AdCo meeting¹². Reasons for this first ever campaign to investigate the impact of the IoT included the following:

- The recent addition of wireless connectivity to domestic appliances presents issues around spectrum congestion and co-existence and there are concerns around an increase of harmful interference;
- The IoT is still developing¹³ and there is uncertainty around any effect it may have on the radio spectrum; and
- Findings of the campaign should provide information on current understanding of, and commitment to, regulatory compliance by manufacturers and will provide information for future campaigns targeting similar areas.

ComReg contributed to this campaign by examining 5 products:

- Smart Kettle;
- Robot vacuum cleaner;
- Smart Washing Machine;
- Induction Hob with wireless connectivity;
- Coffee maker

There were two main findings from ComReg's testing of the above products: all five had a proper CE Marking, on the packaging and the device, however two of the five did not contain the required declaration of conformity.¹⁴

12 For reports on previous campaigns see - ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance/organisation/administrative-cooperation-groups_en

13 See www.forbes.com/sites/louiscolombus/2018/08/16/iot-market-predicted-to-double-by-2021-reaching-520b

14 A Declaration of Conformity is a document which needs to be completed for all CE Marked products sold in the Eu, with few exceptions. Almost all new products require a Declaration of Conformity which must include the following:

- Name and address of organisation taking responsibility for the product
- Description of product
- A list of the applicable safety directives the product complies with
- Details of relevant standards may be included.
- The manufacturer or a representative of the organisation placing the product on the market should then sign the Declaration.

These findings were submitted to the ICSMS¹⁵ and will be presented with the findings from all the other Member States at the next AdCo meeting.

ComReg, having acquired these five products, will also check their compatibility with other relevant technical standards.

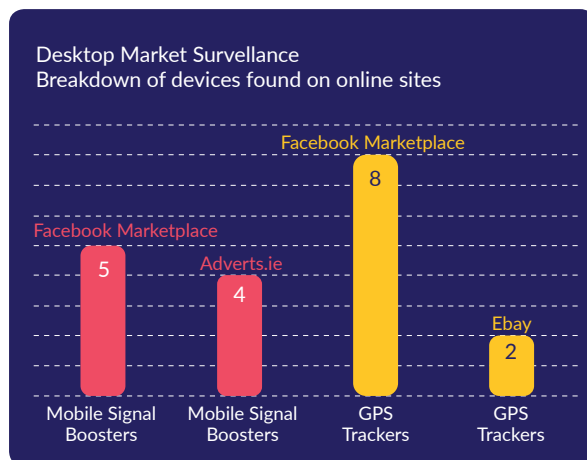
OTHER WORK

Campaign targeting the sale of non-compliant repeaters

Desktop research has identified an ever increasing number of non-compliant mobile telephone repeaters and signal boosters being advertised for sale in Ireland, on various online platforms. ComReg has launched a campaign targeting sellers of these non-compliant products.

Drawing upon our productive working relationships with online platforms including DoneDeal.ie, adverts.ie, Facebook and eBay, identified sellers and suppliers of non-compliant products and was able to intervene to rectify the problem. These actions highlighted a number of sources through which non-compliant products were entering the Irish market and SII will continue to develop the scope and reach of this work in the coming year. Figure 2 demonstrates a breakdown of non-complaint devices taken down from online sites.

Figure 2. Non-compliant devices taken down from On-line Sites 2018-2019



¹⁵ ICSMS The Information and Communication System on Market Surveillance (ICSMS) is an IT platform to facilitate communication between market surveillance bodies in the EU and in EFTA countries.

In the course of this and previous campaigns ComReg experienced a number of challenges and difficulties, including:

- the lack of transparency regarding companies' addresses and contact details;
- drop shipping¹⁶ which makes identification of suppliers difficult; and
- dealing with suppliers outside of Ireland.

ComReg is of the view that addressing these challenges requires regulatory action at an EU level and has been putting forward this view at relevant EC fora. Nationally, ComReg will raise these issues at the National Market Surveillance Forum, to ascertain if other market surveillance bodies have experienced these and similar issues and, if so, the extent to which they have been able to address them.

Product Testing

ComReg responds to reports of illegal or non-compliant products being sold or offered for sale on the Irish market. Suspect products must pass administrative and technical checks to determine if they can be sold or advertised for sale in Ireland.

Administrative checks include checking for:

- an indelible CE mark on the packaging as well as on the product or device itself – a sticker is not an adequate form of marking; and
- a Declaration of Conformity, either in the packaging with the instruction manual or on the manufacturer's website.

Technical checks include:

- radiated radiofrequency measurements to ensure that the product is not producing emissions in unauthorised bands (carried out in an anechoic chamber in compliance with European ENs¹⁷ and

¹⁶ Drop shipping is a retail fulfilment method where a store does not keep the products it sells in stock. Instead, when a store sells a product, it purchases the item from a third party and has it shipped directly to the customer. As a result, the merchant never sees or handles the product. Source: www.shopify.com

¹⁷ European Standards (ENs) are documents that have been ratified by one of the three European Standardization Organizations (ESOs), CEN, CENELEC or ETSI. An EN (European Standard) carries with it the obligation to be implemented at national level by being given the status of a national standard and by withdrawal of any conflicting national standard. Therefore, a European Standard (EN) automatically becomes a national standard in each of the 34 CEN-CENELEC member countries. Standards are voluntary which means that there is no automatic legal obligation to apply them. However, laws and regulations may refer to standards and even make compliance with them compulsory.

ETSI¹⁸ standards);

- conducting radiofrequency emissions on mains cables and signal ports to ensure that nearby domestic systems (e.g. television and radio receivers) are not subject to interference: and
- testing transmitter devices to ensure that the radio signal complies with the power levels and channel occupancy as allowed by CEPT¹⁹ regulations and EU Directives.

Store and shop inspections

ComReg carried out five store inspections in this review period. Five products were identified for further investigation and one of these was subsequently withdrawn from sale.

Store inspections are a relatively new area for SII but are required as ever more products contain a wireless connectivity element. Many retailers are unaware that wireless devices must comply with certain essential requirements and do not understand how to ensure that devices are compliant. However most retailers seem willing to remove non-compliant products from sale, once informed of the issue and of their legal obligations and possible consequences for any non-compliance that is not rectified.

THE YEAR AHEAD

In the next review period SII intends to:

- establish stakeholder relationships with more online platforms;
- conduct awareness campaigns with online platform companies to ensure awareness of their legal obligations in relation to non-compliant products;
- double its store inspections; and
- participate in two more EU-wide targeted campaigns:
 - Under EMCD the 12th Market Surveillance Campaign will assess the administrative and technical compliance (emissions only) of light emitting diode (LED) lighting products intended for in-home use for illumination. This campaign, which commenced on the 1st of July 2019 is planned to last 9 months; and
 - Under RED - an EU wide campaign will focus on Professional Mobile Radio (PMR) devices and their compliance with relevant standards.

BREXIT

There are three main uncertainties in relation to Brexit - will it happen and, if so, when and under what conditions? Once ComReg has greater certainty on the form and nature of Brexit, it will form a view on how Brexit will impact on the market surveillance arena and what steps will need to be taken to implement EU law.

18 ETSI = European Telecommunications Standards Institute – see www.etsi.org

19 CEPT = Conference of European post and telecommunications administrations – see www.cept.org

3. RADIO FREQUENCY INTERFERENCE INVESTIGATIONS



Radio frequency interference (RFI) describes radio frequency signals that disrupt legitimate electronic communications services, whether altogether or temporarily or partially. RFI can affect any radio communication service including but not limited to emergency services, air traffic control, mobile phone services, business radio, microwave links and broadcast services.

RFI is caused by one wireless communications device transmitting at or near the same frequency as another or it can be caused by electromagnetic fields generated by various electronic devices, such as lights and computers. RFI can be unintentional: for example it can be caused by incorrectly or poorly installed radio systems or by faulty or non-compliant electrical or electronic equipment.

ACTIONS TO PREVENT RFI

Operators RFI Forum

As part of the Mobile Phone Taskforce programme²⁰ for 2019, ComReg was tasked with establishing a quarterly forum with providers of key electronic communications services. The forum aims to deepen engagement, increase knowledge sharing, and foster greater collaboration, by facilitating the following:

- provide an opportunity to discuss and consider forward-looking topics – this will help to ensure that ComReg’s Spectrum Intelligence and Investigations Unit is best prepared to ensure the continuing and effective use of the radio spectrum on a continuing basis;
- consider appropriate protocols and supporting procedures for the effective reporting and subsequent investigation, as appropriate, of radio spectrum interference matters;
- identify, discuss and consider emerging trends and issues of common interest; and

- conduct an interim review within 12 months of its first meeting to review the success of the forum and identify any recommendations for its future development.

The forum first met on 18 June 2019, was well attended and made good progress across a number of areas of mutual interest. The next forum will be held during September 2019.

Presence at Major Events

Major sports and entertainment events, state visits, and other large events of a public interest rely extensively on communications, including fast broadband and public broadcasting, and those communications in turn depend on effective spectrum management.

The likelihood of interference arises as each event is setup and intended temporary users of the radio spectrum are installing equipment. Where appropriate and warranted SII endeavours to visit the locations of major events in the run up to its commencement, in order to ensure the integrity of the radio spectrum and to deal with any issues as may arise.

In the case of certain areas of particular national interest, SII has maintained an onsite presence during the entire event.

During the 2018-2019 period, SII provided field team support in the run up to and during the following events:

- Papal visit in August 2018;
- Electric Picnic in August / September 2018;
- The visit of Prince Charles in May 2019;
- UEFA 2020 draw which took place in Dublin in November 2018; and
- The visit of the President of the United States to the Shannon area in June 2019.

Planning for special events typically commences six months prior to the event and requires extensive co-ordination with emergency services, equipment suppliers, and those users of the radio spectrum who will be involved at the events.

The following are just two examples:

- The UEFA 2020 draw was televised live by 70+ broadcasters to a worldwide audience of approximately 140 million viewers and 350 media

²⁰ www.dccae.gov.ie/en-ie/communications/topics/Broadband/mobile-phone-and-broadband-taskforce/Pages/Mobile-Phone-and-Broadband-Taskforce.aspx

representatives were accredited to cover the event. There was extensive use of parts of the radio spectrum and in the run up to the event going live on TV, radio and the internet, SII uncovered 15 wireless microphones and wireless cameras operating without proper licences and hence having the potential to interfere with licensed microphones and cameras. The team also had to resolve several co-channel microphone interference problems.

- The visit by the President of the United States required SII to conduct spectrum occupancy scans and band scans around Shannon, Shannon airport and in a 10 km radius around Doonbeg and Dromoland Castle and its surrounding lands, in the run up to the event. During the visit, SII also remained on site to assist the Gardaí and state security services.

OTHER WORK

ComReg responds to complaints of RFI, approximately 100 of which are received each year. Figure 3 reveals the number of RFI cases received and investigated since 2015. The number of cases is calculated from January to December and it is expected that the total cases to the end of 2019 will be in the region of 120.

Figure 3. Interference cases received each year



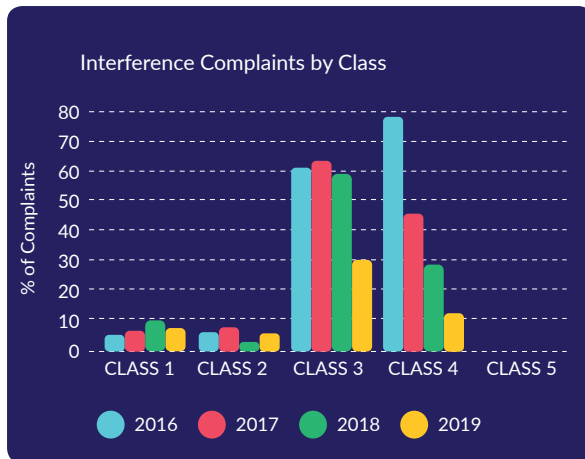
Due to the significant number of complaints and ComReg's resource constraints, ComReg prioritises interference reports based on severity and impact. The criteria currently used are:

- **Class 1** - Interference that is an imminent threat to safety-of-life and serious interference caused to emergency services, air traffic control and maritime traffic control which seriously hampers radio communications. Response time - as soon as possible within 24 hours.
- **Class 2** - Interference that renders a licensed channel unusable or has a detrimental effect on the economic interests of a licensee. Response time - within 3 working days.
- **Class 3** - Interference that is a nuisance to a licensed user but does not render the licensed channel unusable or severely impact the economic interests of the licensee, or severe interference to domestic reception and amateurs. Response time - within 7 working days.
- **Class 4** - Occasional or minor interference to a licensed user that has no detrimental effect on the licensee's operations, or nuisance interference to domestic reception and amateurs. Response time - within 15 working days.
- **Class 5** - Spurious complaints that do not warrant the direct intervention of ComReg. Response time - N/A

ComReg is of the view that its complaint classification system should be revisited and plans to undertake a public consultation on this matter.

Figure 4. Breaks down reported RFI complaints by class over the past 4 years.

Figure 4. Interference complaints by class



As can be seen from Figure 4, more than 80% of complaints fall into Class 3 or 4. Taking this into account, and having regard to its resource constraints, in 2017 ComReg has outsourced the investigation of Class 3 and 4 complaints to Butler Technologies.²¹ This has released SII staff to focus on matters of highest priority, such as interference to emergency services (Class 1), and on proactive tasks such as market surveillance and radio monitoring.

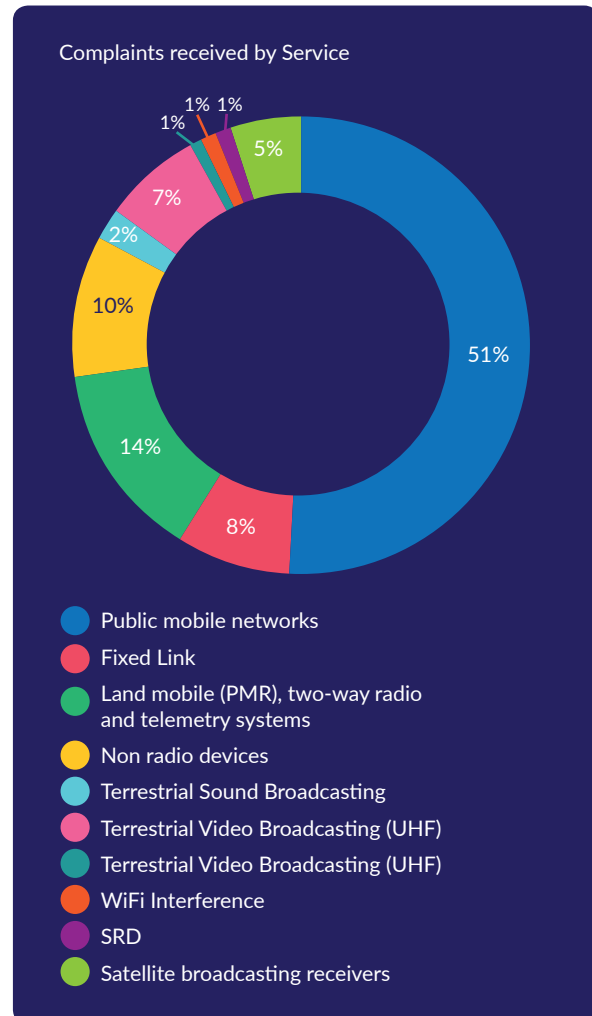
This outsourcing has resulted in a significant decrease in the number of open cases and has proven to be of great value in releasing resources for other important tasks.

Figure 5 reveals the following:

- more than half of all RFI complaints concern alleged interference to public mobile networks; and
- 14% of complaints concern alleged interference to land mobile (PMR), two-way radio and telemetry systems (this includes priority Class 1 complaints where interference is allegedly being caused to safety-of-life and/or aeronautical services.)

During the 2018-2019 period, SII responded to several reports of interference to safety-of-life services, including Air Traffic Control, Gardai, and Dublin Fire Brigade.

Figure 5. Complaints received by Service 2018-2019



Information Campaigns in 2018-2019

As noted in Figure 5, more than 50% of all RFI complaints concern alleged interference to mobile networks. The two primary sources of RFI to mobile networks are:

- Faulty TV antenna masthead amplifiers; and
- Mobile phone boosters

It is not uncommon for an external TV antenna to be erected with some form of signal amplifier, to ensure reception of a strong signal. A common failure of these amplifiers is when they act as oscillators and thereby cause quite powerful and wide bandwidth noise in the 800 MHz and 900 MHz bands, both primarily used by mobile networks. Amplifiers that interfere with mobile services in such a manner are illegal and these must be

²¹ www.butlergroup.ie

located and removed as a single amplifier can interfere with multiple mobile base stations. Typically, there is greater use of these amplifiers in rural areas and locating them often requires many hours of direction-finding and travel to locate and remove them.

The use of non-compliant, and therefore illegal, mobile phone boosters also continues to be a significant cause of interference to mobile networks. Over 60% of interference to mobile networks in the State is caused by these devices.

Boosters are usually cheap amplifiers that do not have any form of intelligence and hence offer no protection to the operation of licensed mobile networks. It is common for boosters to simply amplify all signals received and retransmit these, causing interference in particular to mobile networks. These devices are strictly illegal and may not be possessed, used or sold anywhere in Ireland.

Mobile phone repeaters, while also amplifying signals, do so with enough intelligence as to be able to detect the radio spectrum environment in which they operate

and take steps to prevent interference to other services. Technical standards ensure that compliant repeaters operate in harmony with mobile networks. However not all repeaters meet those standards.

To ensure that suppliers and consumers can distinguish between legal repeaters and illegal boosters, in July 2018 ComReg made an exemption order which permits consumers to buy and use legal mobile phone repeaters, being those makes and models which meet technical conditions as specified therein.²²

To increase awareness among manufacturers, distributors, suppliers, installers and the general public, ComReg conducted an information campaign to inform that:

- Mobile phone repeaters could help with poor indoor reception;
- Only certain types of repeater that meet the right standards are legal to use;
- Illegal devices can cause interference and will be taken away by ComReg and could lead to the possible fines for the user; and

Figure 6. Information on mobile repeaters

Mobile Repeater Information

An Coimisiún um Rialáil Cumarsáide
Commission for Communications Regulation

WHAT IS A REPEATER?
A mobile repeater is an electronic device that can be used to improve indoor coverage of mobile phone services.

These devices are ideal for people with poor indoor reception. Poor indoor signal is caused by many factors, including the type of insulation used in the home.

HOW DO THEY WORK?
An external antenna picks up the mobile phone signals outside the home then amplifies it inside the home giving the user improved indoor reception.

Only repeaters that comply with ComReg's standards and carry the CE and EU quality standard mark are permitted.

ComReg strongly recommends and advises having a professional installer conduct the installation.

Illegal devices that do not meet these conditions can cause interference to the mobile network and even other consumer devices.

For further information on repeaters and suppliers please see comreg.ie/repeaters

22 S.I. No. 283 of 2018 Wireless Telegraphy Act 1926 (Section 3) (Exemption of Mobile Phone Repeaters) Order 2018

- Consumers can find out more information on repeaters at www.comreg.ie/repeaters

Figure 6 is an example of literature produced as part of this Information Campaign to educate the public about legal mobile repeaters.

THE YEAR AHEAD

Categorisation of interference complaints

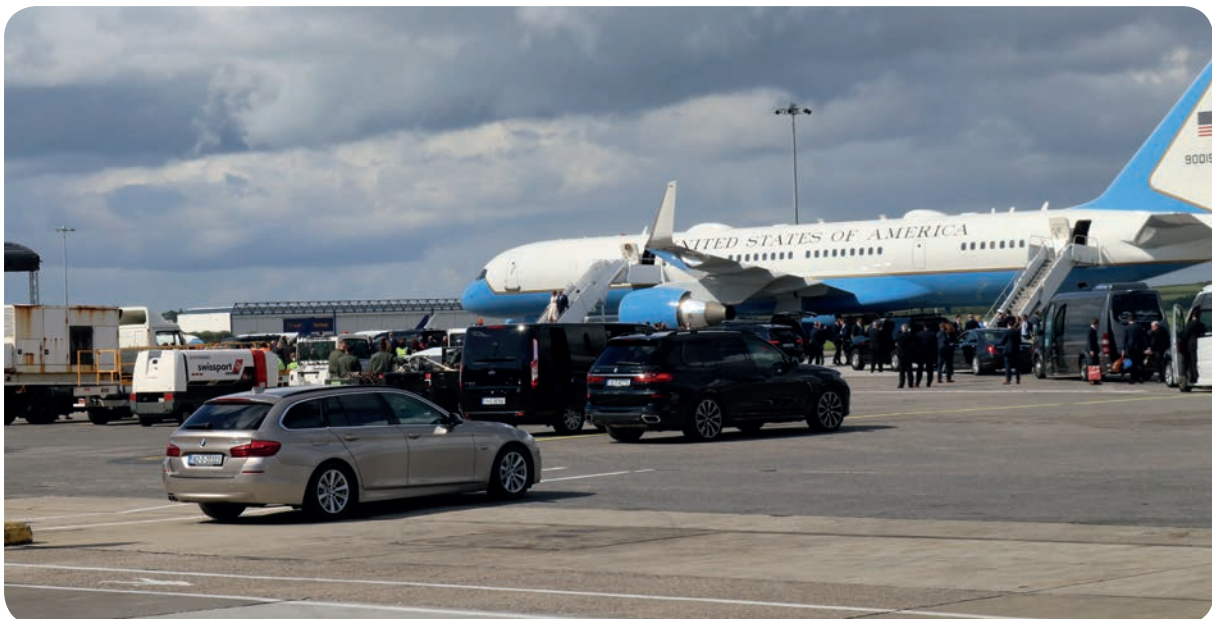
The current categorisation of RFI complaints is more than a decade old and ComReg has since gained considerable experience in conducting RFI investigations and has outsourced its investigative work for certain categories of complaints. In light of this, ComReg is of the view that its complaint classification system now needs to be revisited. ComReg will therefore carry out a public consultation in Q4 of 2019 on the current classification. As part of this project, ComReg will consider the degree to which it may develop a more collaborative relationship with licensees to deal with RFI.

Attendance at Special Events

In the coming year ComReg expects that there will be a number of major events which will require attention.

SII must balance its resources in order to provide sufficient cover at such events while also managing other ongoing priorities. It is proving especially difficult to support music and sports events, especially multi-day events where the drain on SII personnel and resources cannot be justified, when weighed against other priorities. However, ComReg will continue to prioritise events where attendance by SII is requested by the Gardai or other emergency services.

Figure 7. The arrival of the President of the United States of America Donald Trump and First Lady Melania Trump at Shannon Airport June 2019



4. RADIO SPECTRUM MONITORING



RADIO SPECTRUM MONITORING

The Radio Spectrum Monitoring team:

- gathers intelligence in relation to unlawful spectrum usage;
- certifies the proper technical and operational characteristics of transmitted signals (licence compliance);
- provides data for the spectrum management process concerning the actual usage of spectrum (channel occupancy and congestion); and
- verifies frequency records.

Spectrum monitoring falls within ComReg's overall spectrum management function and is complementary to, and supportive of, other aspects of that function including, in particular RFI investigations, granting rights of use for radio frequencies with conditions attached, and related compliance and enforcement activities.

EQUIPMENT AND FACILITIES

Comprehensive spectrum occupancy measurements and identifying the source(s) of transmissions is often the first and most important step in finding the sources of RFI and resolving them.

Work undertaken in spectrum monitoring, requires the use of a national network of remote monitoring sites, at fixed locations throughout the State. It also requires use of various types of vehicle-mounted, semi-portable, portable and hand-held measuring equipment.

Over the past five years ComReg has sought to increase its efficiency in this area by establishing a network of remote spectrum monitoring nodes strategically located in key urban areas throughout the State. This has facilitated:

- a reduction in the time taken to respond to RFI complaints as staff no longer have to travel to specific locations in order to confirm the validity of complaints received, as they previously had to, but can instead do much of this remotely;

- a notable reduction in the travelling time undertaken by staff to undertake proactive onsite monitoring activities, releasing them for other SII work; and
- a systematic programme of remote measurements which provides meaningful data about spectrum usage, in particular through spectrum occupancy measurements that describe the utilisation rate of various spectrum bands of interest (particularly useful in providing valuable information about the efficiency of current spectrum allocations and assignments).

Examples

The full range of SII resources are used when preparing for spectrum awards and when campaigns are initiated to ensure that any illegal activity in the bands being awarded has ceased. This has proven to be an invaluable exercise in the recently awarded 3.6 GHz band²³.

The national monitoring network is capable of performing time domain direction finding which has greatly aided the detection of sources of illegal broadcasting in rural and semi-urban areas. To achieve this in the past, using vehicle-mounted equipment, required many person-hours and in, in some instances, prevented ComReg from taking actions in as timely a manner as it would have wished.

MEASUREMENT OF NON-IONISATION RADIATION

Under the General Authorisation²⁴ for the provision of an electronic communications networks and/or services authorised undertakings must ensure that public exposure to non-ionising radiation (NIR) emissions from transmitters are within limits set by the International Commission on Non-Ionising Radiation Protection (ICNIRP)²⁵.

In general, NIR emissions from a licensed transmitter must not exceed ICNIRP limits in any part of the site

²³ Please see www.comreg.ie/industry/radio-spectrum/spectrum-awards/3-6-ghz-band-transition/

²⁴ See: www.comreg.ie/publication/general-authorisation-for-the-provision-of-electronic-communications-networks-and-services/

²⁵ See: www.icnirp.org

or surrounding area to which the general public has access. Since 2003, and in order to assess compliance with this condition, ComReg conducts circa 80 NIR surveys per annum at transmitter sites located throughout the State.

In this reporting period ninety-one (91) surveys were carried out. Eighty (80) of the sites surveyed were selected on the basis of population distribution and the other eleven (11) were selected to check on new technologies and sites of concern²⁶.

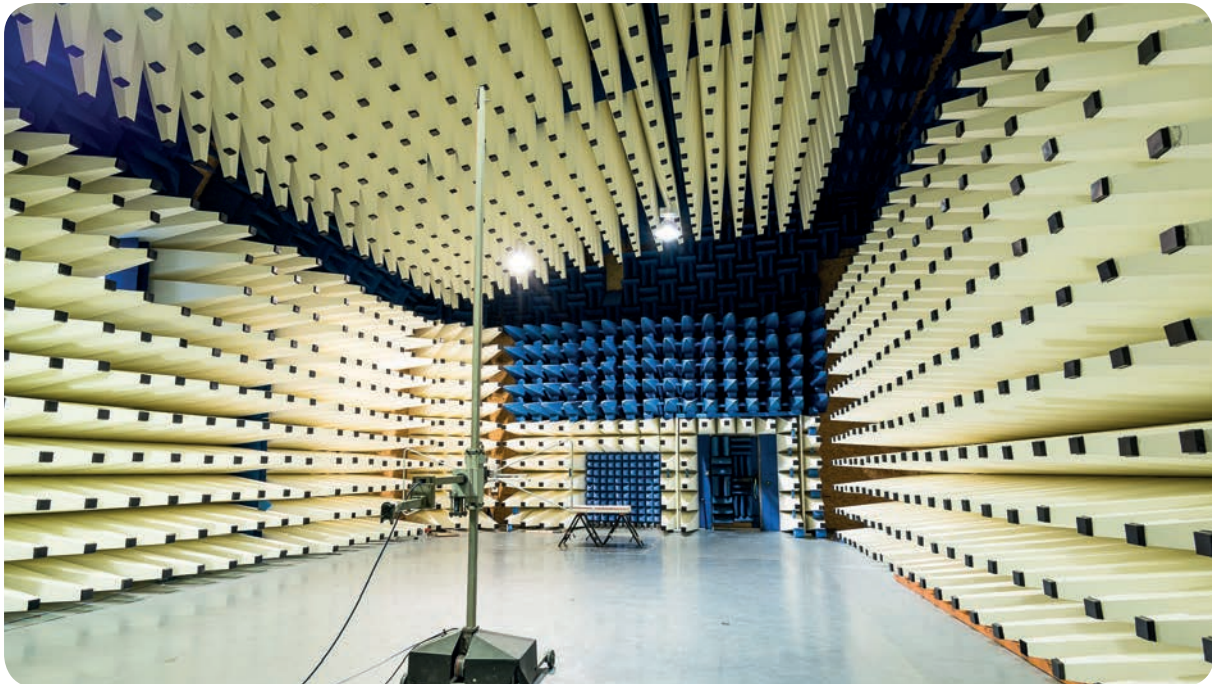
Further information and the repository for all the reports since 2003 can be found here – www.comreg.ie/nir-reports-2/

THE YEAR AHEAD

SII is planning to undertake the following actions related to spectrum monitoring in the next reporting period:

- Assess the use, both legally and illegally (if any), of the 400 MHz band²⁷ which is planned for award by the end of 2019;
- Assess the use, both legally and illegally (if any), of both the 2.3 GHz and 2.6 GHz bands. These two bands comprising of 290 MHz of spectrum are scheduled for release as part of the proposed multi band spectrum award²⁸; and
- Look to replace the current national fixed monitoring network – after 5 years the current network is becoming obsolete, difficult to maintain and the next generation of monitoring tools are available.
- SII will continue to carry out NIR tests on a similar number of sites in the next reporting period.

Figure 8. Fully anechoic 3m range test chamber is dedicated to radio testing at CEI¹ used to test against RED and EMCD 1 CEI – Compliance Engineering Ireland – cei.ie is contracted by ComReg to conduct RED and EMCD compliance checks



²⁶ Sites of concern include new transmitter sites, the higher utilisation of existing sites and sites covering areas where public access may be cause for concern and need to be evaluated.

²⁷ See www.comreg.ie/industry/radio-spectrum/spectrum-awards/400mhz-band-spectrum/

²⁸ See www.comreg.ie/industry/radio-spectrum/spectrum-awards/proposed-multi-band-spectrum-award/

5. COMPLIANCE & ENFORCEMENT



COMPLIANCE & ENFORCEMENT

Compliance and enforcement action comes into effect whenever illegal activity affecting the radio spectrum resource is identified. It involves monitoring compliance by all licensees with the conditions of their respective licences and taking enforcement action in respect of any non-compliance, where justified and in a proportionate manner.

Most of this work is reactive by its nature and supports related activities in the areas of market surveillance, RFI investigations, and spectrum monitoring.

ComReg's powers in exercising its compliance and enforcement function include the following:

- Seizing of non-compliant equipment;
- Verbal warnings to those carrying out or supporting illegal activities;
- Written warnings to those carrying out or supporting illegal activities;
- Section 13D information requests – see Annex 1 for details;
- Section 7 notices – see Annex 1 for details;
- Authorised Officer visits as part of an investigation to find the source of RFI or the illegal use of the spectrum;
- Search Warrant executions to access premises to search for and seize equipment; and
- Criminal prosecutions to seek court mandated sanctions to compel compliance with the law.

COMPLIANCE & ENFORCEMENT ACTIVITIES

In addition to the work under taken in support of market surveillance (Chapter 2) and RFI (Chapter 3) the following actions were undertaken in the reporting period:

- Four actions against unlicensed broadcasters. These actions were primarily in areas outside of Dublin and reflect the ongoing requirement to undertake such action;
- The finding and seizing of a number of non-compliant wireless cameras operating in spectrum licensed to other services;
- The identification and removal of devices similar to DECT phones that are not operating in the harmonised EU spectrum bands and are/may be causing interference to a range of licensed services; and
- Assisting An Garda Síochána in locating jammers affecting police and security force communications.

To undertake these actions SII has:

- Made four appearances before a District Court Judge;
- Obtained and executed four search warrants;
- Sought the seizure of more than 40 pieces of non-compliant equipment and equipment used to conduct unlicensed broadcasting;
- Issued:
 - 20 Verbal warnings;
 - 7 Written warnings; and
 - 4 Section 7²⁹ notices.
- Conducted 1 Authorised Officer visit; and
- Initiated 2 prosecutions.

Many investigations do not result in criminal prosecution. Where co-operation is forthcoming in removing the source of the interference (e.g. mobile boosters or faulty TV mast head amplifiers), and the matter has been satisfactorily resolved, no further legal action is taken.

²⁹ See Annex 1

Support of market surveillance

In support of the market surveillance of products, as detailed in Chapter 2, enforcement actions are undertaken against suppliers that place or seek to place non-compliant equipment onto the Irish market.

Investigations into licence compliance

In support of ComReg's Licensing Team, when a valid licence has not been renewed or has been cancelled, a compliance action is undertaken to ensure that the transmitter and other equipment have been removed from service.

THE YEAR AHEAD

ComReg proposes to:

- Conduct a campaign targeting the 450 – 470 MHz professional mobile radio (PMR) band. This campaign is in support of one of the actions identified ComReg's Radio Spectrum Management Strategy Statement, i.e. "Consult on a business radio licensing regime to permit the use of national channels on a technology- and service-neutral basis". The purpose of this campaign is to conduct usage studies and to verify current records³⁰ to assist in spectrum management considerations of the future use of this band; and
- Conduct detailed examination of a number of sites³¹ in each quarter. ComReg has circa 12,000 fixed link licences and in the Radio Spectrum Strategy Statement identified five actions which may result in substantial spectrum becoming available as new fixed link bands. To ensure these bands as well as current bands are free from interference ComReg plans to conduct technical examinations of high sites to ensure compliance with licence conditions and to identify any illegal use of these bands.

³⁰ Many records predate both ComReg and its predecessor, the ODTR (The Office of the Director of Telecommunications Regulation)

³¹ A high site refers to a tower located to provide radio communication links to a variety of systems. These are so named as they usually comprise one or more very tall towers that have a large number of directional and other antennas.

Figure 9. Typical temporary infrastructure set up at special events that need co-ordination



Figure 10. ComReg presence at Shannon Airport for POTUS visit 2019



ANNEX 1: SUMMARY: LEGAL FRAMEWORK RELEVANT TO SII

The core statutory functions of the Commission for Communications Regulation (“ComReg”) are set out in section 10 of the Communications Regulation Act 2002, as amended (“2002 Act”)³² while its objectives, in the exercise of those functions, are set out in section 12 of the 2002 Act and in Regulation 16 of the Framework Regulations 2011.³³ ComReg’ functions under the 2002 Act that are particularly relevant to this report are as follows:

- (a) to ensure compliance by undertakings with obligations in relation to the supply of and access to electronic communications services, electronic communications networks and associated facilities and the transmission of such services on such networks ...
- (b) to manage the radio frequency spectrum and the national numbering resource ...
- (d) to carry out investigations into matters relating to—
- (i) the supply of, and access to, electronic communications services, electronic communications networks and associated facilities and the transmissions of such services on such networks ...
- (e) to ensure compliance, as appropriate, by persons in relation to the placing on the market of communications equipment and the placing on the market and putting into service of radio equipment.

³² https://www.lawreform.ie/_fileupload/RevisedActs/WithAnnotations/HTML/EN_ACT_2002_0020.htm

³³ European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. 333/2011) transposing Directive 2002/21/EC

ComReg’s objectives in exercising its functions are, in summary, to promote competition, to contribute to the development of the internal market, to promote the interests of users within the Community, and to ensure the efficient management and use of the radio frequency spectrum and numbers. Section 12 of the 2002 Act expands upon each of these objectives and section 12(2A) sets out various reasonable measures that ComReg shall take to achieve its objectives. In addition, Regulation 16(2) of the Framework Regulations 2011 requires ComReg, in pursuit of its objectives, to apply objective, transparent, non-discriminatory and proportionate regulatory principles and describes various means by which ComReg may apply those principles.

ComReg is also the designated surveillance and enforcement authority in the State for each of the following:

Wireless Telegraphy Act 1926, as amended (“1926 Act”)

European Union (Radio Equipment) Regulations 2017³⁴ (“RE Regulations”)

European Communities (Electromagnetic Compatibility) Regulations 2016 and European Communities (Electromagnetic Compatibility) Regulations 2017³⁵ (together the “EMC Regulations”)

Wireless Telegraphy Act 1926, as amended

The 1926 Act requires one to hold a valid licence in order to possess or use, anywhere in the State, any type of “apparatus for wireless telegraphy”, as defined therein. Such licences are granted by ComReg on foot of regulations made by ComReg pursuant to section 5 and 6 of the 1926 Act.³⁶ A wireless telegraphy is also the legal instrument for assigning right of use for radio frequencies to authorised undertakings who apply form same, in accordance with applicable provisions of the Framework Regulations 2011 and Authorisation Regulations 2011.³⁷ Amongst other things, a licence sets out the specific radio frequencies that the licensee

³⁴ S.I. 248/2017, transposing Directive 2014/53/EU

³⁵ S.I. 145/2016 and S.I. 69/2017, both transposing Directive 2014/30/EU

³⁶ Subject to the required consent of the Minister from Communications, Climate Action and Environment under section 37 of the 2002 Act.

³⁷ European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. 335/2011) transposing Directive 2002/20/EC

may use and attaches conditions to the use of those frequencies, subject to list of possible conditions set out in Part B of the Schedule to the Authorisation Regulations 2011.

The 1926 Act makes it an offence to interfere, deliberately or otherwise, with lawful wireless telegraphy and ComReg's investigatory powers include the power to enter and search premises, if needs be by force, under a warrant granted by a Judge of the District Court.

European Union (Radio Equipment (RE)) Regulations 2017

The RE Regulations define "radio equipment"³⁸ and Regulation 4 requires all radio equipment to comply with the following "essential requirements":

- (a) to protect the health and safety of persons and domestic animals and to protect property and so to comply (other than in relation to voltage limits) with the safety requirements of the European Union (Low Voltage Electrical Equipment) Regulations 2016;
- (b) to have an adequate level of electromagnetic compatibility in compliance with the European Communities (Electromagnetic Compatibility) Regulations 2017 (S.I. No. 69 of 2017);
- (c) to both effectively use, and support the efficient use of, radio spectrum in a manner that avoids harmful interference.

The above essential requirements apply to all relevant undertakings in the chain for the manufacture and supply of radio equipment. The RE Regulations define "manufacturer", "importer", and "distributor". Hence a manufacturer must build radio equipment to required standards but importers and distributors, in turn, must ensure that such equipment was made to standard. This is done largely through "CE markings" and "EU declarations of conformity". The former is defined as "a marking by which a manufacturer indicates that the radio equipment is in conformity with the applicable requirements set out in Union harmonisation legislation providing for its affixing." The latter is a written

document drawn up in accordance with Regulation 17 of the RE Regulations.

Regulation 30 of the RE Regulations designates ComReg as the market surveillance authority in the State for the purposes of the RE Regulations and RE Directive, with responsibility for exercising all surveillance and enforcement and with a range of powers in the exercise of its functions.

Regulation 31 provides that where ComReg, as the market surveillance authority, believes that any radio equipment presents a risk to health and/or safety then ComReg shall, without delay, evaluate that equipment in respect of all relevant requirements under the RE Regulations. The economic operator (i.e. manufacturer, importer, or distributor) concerned must co-operate any such evaluation. Where ComReg finds that radio equipment does not comply in some manner, it shall notify the economic operator concerned. Where ComReg believes that action is required to prevent a risk to health or safety, it may direct the economic operator concerned, within a period specified, to do any of the following: take all appropriate corrective action to bring the equipment into compliance; withdraw the equipment from the market; or recall equipment already placed on the market. Such a direction must be complied with by the economic operator concerned.

Regulation 39 empowers ComReg, in its capacity as market surveillance authority, to carry out inspections of radio equipment, where appropriate, on its entry into the State (where the State is the equipment's point of entry into the EU), or at any site in the State where radio equipment is stored or manufactured. ComReg is also mandated to perform appropriate surveillance of radio equipment made available on the Irish market or put into service in Ireland.

Regulation 40 provides that ComReg, as market surveillance authority, may appoint members of its staff or other persons considered suitably qualified to be Authorised Officers for the purpose of the RE Regulations and RE Directive. Regulation 41 empowers an Authorised Officer, at all reasonable times, to enter and search places there are reasonable grounds to believe that radio equipment is being manufactured, stored, distributed, supplied, or otherwise made available on the market. Regulation 42 provides that for the purposes of entering a premises by force, an Authorised Officer must first obtain a warrant from a Judge of the District Court.

³⁸ "an electrical or electronic product, which intentionally emits or receives radio waves for the purpose of radio communication or radiodetermination, or an electrical or electronic product which must be completed with an accessory, such as antenna, so as to intentionally emit or receive radio waves for the purpose of radio communication or radiodetermination;"

European Communities (Electromagnetic Compatibility) Regulations 2016 and 2017

ComReg is also the designated competent authority and market surveillance authority in the State under and for the purposes of the EMC Regulations which prohibit any person from making available on the market or putting into service equipment to which the EMC Regulations apply, unless such equipment complies with the Regulations when properly installed, maintained and used for its intended purpose, including that such equipment must meet the essential requirements as set out in Annex I to the EMC Directive.

As with the RE Regulations, the obligations imposed under the EMC regulations apply to all economic operators in the chain for the manufacture and supply of equipment – i.e. manufacturers, importers, and distributors. ComReg may carry out evaluations as to whether equipment complies with the requirements of EMC Regulations and relevant economic operators must as necessary with such evaluations. If, in the course of such an evaluation, ComReg finds that equipment does not comply with the Regulations in some manner, ComReg shall issue a “risk compliance notice” requiring the economic operator concerned to do any of the following: take all appropriate corrective actions to bring the equipment into compliance; withdraw the equipment from the market, or recall the equipment from the market.

Regulation 25(1) mandates ComReg to inspect apparatus and fixed installations, where appropriate, and ComReg may require economic operators to provide such information as it requires. Regulation 25(2) tasks ComReg with carrying out surveillance of equipment made available on the Irish market having regard to the requirements of these Regulations. Regulations 26 and 27 set out a suite of search and entry powers very similar to those under the RE Regulations. Appointed Authorised Officers, with or without a District Court warrant as necessary, may at all reasonable times enter and search any premises, place, vehicle, vessel, or aircraft at or in which the officer has reasonable grounds for suspecting that there is equipment present or that records relating to equipment are kept.



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