An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Spectrum Intelligence & Investigations Annual Report

2019 - 2020

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1 Introduction

1.1 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 and in accordance with European ("EU") and Irish law. ComReg also manages Ireland's radio frequency spectrum ("radio spectrum" or "spectrum") and the national numbering resource.

1.2 Radio spectrum is the medium by which information may be transmitted wirelessly over distances ranging from a few centimetres to thousands of kilometres. These communication services include mobile telephony, wireless broadband, radio and television broadcasting and radio communications used by commercial business and by air and maritime transport. Many services rely on wireless connectivity as part of the backbone linking mobile base stations, providing feeds to broadcast transmitters and telemetry links that allow the monitoring of disperse infrastructure e.g. water reservoir levels and remote power transformers.

1.3 Radio spectrum is also fundamental in the day-to-day operation of the emergency services and defence forces, as well as being a vital input to many other important services, for example weather forecasting, and scientific applications such as those used for monitoring the environment.

1.4 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 Income[1]

1.5 Radio spectrum underpins much of the communications services in the State and is a finite national resource, with competing uses and users. It therefore requires careful management to ensure it is used effectively and efficiently.

1.6 Optimised use of radio spectrum depends on proper management of the resource to ensure, amongst other things, that radio communications systems can operate with minimum interference[2]. 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

[1] ComReg18/118 – Radio Spectrum Management Strategy Statement 2019 to 2021.

[2] The radio spectrum needs be managed because two or more radio signals occurring 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.

1.7 ComReg, acting within its legislative remit and its budgetary and staff resources, seeks to ensure that all lawful wireless services and devices permitted in the State are free from harmful interference. Annex 1 of ComReg Document 18/118[3] sets out in detail the key statutory provisions under which ComReg manages the radio spectrum resource.

1.8 The Spectrum Intelligence & Investigations (SII) Unit, residing within ComReg's Market Framework Division, is responsible for ensuring the integrity of the spectrum resource. Within the SII unit, work is separated into four work streams:

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

1.9 The government restrictions imposed in March 2020 as a result of the Covid-19 pandemic necessarily restricted and in some cases curtailed the activities associated with some of these workstreams. Notwithstanding, this Annual Report sets out a concise outline of ComReg's activities during the reporting period (1 July 2019 to 30 June 2020) in respect of the activities of the SII Unit.

1.10 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 2021
- **Chapter 3** focuses on radio frequency interference investigations in the reporting period and plans to July 2021
- **Chapter 4** reports on radio spectrum monitoring activities in the reporting period and plans to July 2021
- **Chapter 5** provides information on compliance and enforcement actions supporting the activities outlined in chapters 2-4
- **Annex 1** sets out a summary of the legal framework applicable to SII and
- **Annex 2** Revised RFI complaint classification process.

[3] ComReg/18/118 – Radio Spectrum Management Strategy Statement 2019-2021

2 Market Surveillance of Radio Communications Products

2.1 Market surveillance of products is a requirement of the EU Single Market. It refers to *"the activities carried out and measures taken by public authorities to ensure that products comply with the requirements set out in the relevant Community harmonisation legislation and do not endanger health, safety or any other aspect of public interest protection"*[4].

2.2 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. Market surveillance can include actions such as product withdrawals, recalls and the application of sanctions to stop the circulation of non-compliant products and/or bringing any such products into compliance.

2.3 To support this principle, all products produced in, or imported into, the EU must meet certain identified 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

2.4 ComReg is the designated Market Surveillance Authority in respect of two EU Directives the Electromagnetic Compatibility Directive 2014/30/EU ("EMCD") and the Radio Equipment Directive 2014/53/EU ("RED").

2.5 The EMCD is transposed into Irish law by way of the European Union (Electromagnetic Compatibility) Regulations 2017 (S.I. No. 69/2017) ("EMC Regulations") and establishes a regulatory framework for placing equipment on the market by setting essential requirements for all equipment.

2.6 The RED is transposed into Irish law by way of the European Union (Radio Equipment) Regulations 2017 (S.I. No. 248/2017) ("RE Regulations"), which establishes a regulatory framework for placing radio equipment on the market (e.g. radio-frequency identification tags, and consumer goods such as portable Bluetooth radios) by setting essential requirements for all radio equipment The essential requirements as set out in Part 2 of SI. No 248 of 2017 are as follows:

- to protect the health and safety of persons and domestic animals and to protect property and to comply (other than in relation to voltage limits)

[4] https://ec.europa.eu/growth/single-market/goods/building-blocks/market-surveillance

with the safety requirement of the European Union (Low Voltage Electrical Equipment) Regulations 2016;

- to have an adequate level of electromagnetic compatibility in compliance with the European Communities (Electromagnetic Compatibility) Regulations 2017 (S.I. No. 69 of 2017); and

- to both effectively use, and support the efficient use of, radio spectrum in a manner that avoids harmful interference.

2.7 In Chapter 2 of its 2018-2019 Annual Report[5], SII identified the likely benefits of more robust and smarter methods of checks both administratively and technically on wireless devices placed on the Irish Market to ensure their compliance with EU harmonised standards.

2.8 These methods include strengthening and developing stakeholder relationships, more retail inspections and more desktop market surveillance of online platforms. This chapter details the progress made during the 2019 – 2020 work period.

2.1 Proactive Market Surveillance

Desktop Market Surveillance

2.9 Desktop market surveillance continued throughout the year with consistent and strategic monitoring of all the major online platforms such as eBay, DoneDeal, Amazon and Google Marketplace. ComReg's desktop surveillance is focussed and targeted particularly on products which it considers to be most likely to cause harmful interference to authorised electronic communications services, currently mobile phone boosters, GPS trackers, and TV Set Top boxes.

2.10 Figure 1 provides a breakdown of devices (by category) removed from online sites at ComReg's instigation over the last two years.

4 ComReg Document 19/86

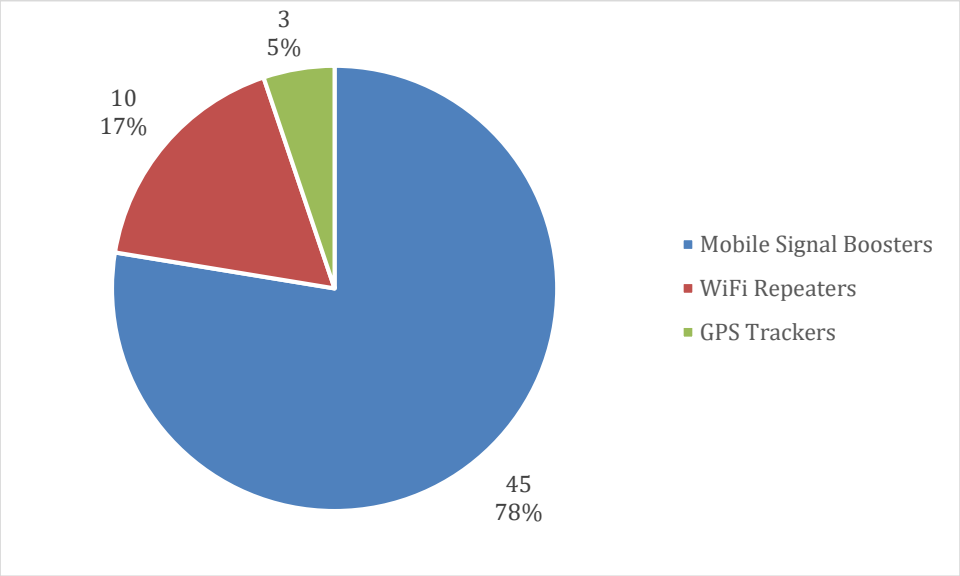

Figure 1. Breakdown of devices taken down from online sites.

2.11 Many of the devices removed were mobile signal boosters, along with non-compliant Wi-Fi repeaters and some GPS trackers. In this reporting year SII arranged to have 58 non-compliant devices removed from online platforms.

Retail Inspections

2.12 As part of its market surveillance activity, ComReg sources products from retail stores which include nationwide retailers, independent wholesalers and small high-street shops. Test purchases are made, often encompassing items that form part of a targeted campaign, for example LED Lights and TV Set Top boxes in recent times. This is an important aspect of ComReg's market surveillance activities as it permits a physical examination of products, allowing full administrative and technical checks to be undertaken.

2.13 This action also provides an opportunity to engage with retailers who may not be fully aware of their obligations as importers and distributors under the RE and EMC Directives/Regulations. In addition, this engagement often informs ComReg of consumer demand for certain radio products and buying patterns and trends.

2.14 Arising from government restrictions imposed as a result of the Covid-19 pandemic and the subsequent closure of non-essential retail outlets, ComReg's planned market surveillance of retail store inspections was temporarily suspended in March 2020. In the interim, ComReg has diverted resources to online market surveillance but aims to resume its normal programme shortly.

Engaging with Stakeholders

2.15 A key component of our proactive market surveillance work is maintaining existing relationships and developing new ones with relevant stakeholders.

2.16 In order to engage with and inform stakeholders on a regular basis, formal meetings were set up during this reporting period to develop and improve our stakeholder relationships with other authorities for example with:

- key personnel in the Competition & Consumer Protection Commission (CCPC). In November 2019 to discuss collaboration in training requirements regarding the use of the European ICSMS database; and

- the Sustainable Energy Authority Ireland (SEAI) in January 2020 to discuss mutual co-operation regarding the EU joint market surveillance campaign regarding light emitting diodes (LEDs).

2.17 ComReg continues to liaise with its EU counterparts on matters of mutual interest and participates in the National Market Surveillance Forum which is chaired by the Department of Business, Enterprise and Innovation. In this reporting period much of the discussions and presentations were focussed on the impact of Brexit and customs related activities and procedures.

Liaison with Major Online Platforms

2.18 Regarding desktop market surveillance, ComReg has engaged with key staff in all the major online platforms. SII staff have met with personnel from Google, Amazon and eBay, whose European Headquarters are all based in Dublin.

2.19 In addition, ComReg continues to engage with and deepen its relations with Facebook, Done Deal and Adverts.ie. SII staff enjoy good working relationships with these companies and has developed measures such as web contact template forms or has access to law enforcement portals, especially established for government agencies for the removal of non-compliant products. This enables the swift removal of non-compliant products and offending website adverts as appropriate. Bi-annual meetings with relevant stakeholders will continue in the year ahead.

The National Market Surveillance Forum

2.20 The Department of Business, Enterprise and Innovation has established a quarterly National Market Surveillance Forum to bring together all market surveillance authorities in Ireland, across all sectors. This broad and diverse forum includes ComReg in its capacity as the Market Surveillance Authority for the RED and EMCD. Matters such as statistical updates, handling procedures and forecasts from Customs are regularly shared along with up-to-date information regarding Brexit. The forum also provides the very useful opportunity to share challenges and learnings with other Market Surveillance Authorities.

The European Union

2.21 In relation to the two European Directives (RED and EMC) which underpin SII's Market Surveillance activity, several Administrative Cooperation Groups (AdCos) and Working Group Parties have been established. Members of these groups represent the national authorities responsible for market surveillance in various sectors. Meetings are typically held bi-monthly to discuss and share market surveillance issues, while ensuring an efficient, comprehensive and consistent approach to market surveillance across the Union.

2.22 ComReg staff attend these meetings and, where appropriate, take part in Joint EU Market Surveillance campaigns. Campaign scope is agreed by the relevant AdCo committee i.e. RED Adco or EMC Adco. The recently commenced 13th EMC Joint Market Surveillance Campaign will focus on targeting domestic microwave ovens for compliance assessment. The campaign which is planned to last 9 months commenced on the 1st of July 2020.

2.2 Reactive Market Surveillance

2.23 During the course of its market surveillance activities, SII invariably receives intelligence from various sources about potential non-compliant products and where appropriate, prepares and executes a plan of action to address same.

2.2.1 Case Study - Set-Top Box Market Surveillance Campaign

Explanatory Box 1. Set-Top Box Market Surveillance Campaign

In 2020, ComReg undertook a market surveillance campaign in relation to TV set-top boxes. Set-top boxes are devices that contain a TV tuner input and display output to a TV set for home viewing. These devices are often distributed by TV service providers but are also available online and in shops for independent use.

Purpose of the campaign

The purpose of the campaign was to assess the compliance of a number of sample TV set-top boxes taken from the market and with the obligation of compliance with the essential requirements of the Radio Equipment Directive 2014/53/EU ("RED") and Irish Regulations S.I. No. 248 of 2017 ("RE Regs").

The goals and objectives of the campaign • To determine the exact administrative and technical levels of compliance. • To apply the measures of the RED (including safeguard procedure, if necessary); • to take appropriate compliance actions to rectify non-compliance; to raise awareness of manufacturers'; importers'; distributors'; and economic operators' obligations under the RED and RE Regs.

Two devices were purchased online and one from a phone shop in Dublin. A HK1 max, a M4K Android TV set-top box and a MAG322.

All three devices contained a WiFi transmitter.

Administrative compliance checks: The products were checked for the following:

• CE marking;

• Declaration of Conformity ('DoC')[6];

• Traceability (name or registered trademark and address of the manufacturer/importer).

From Article 10 of the RED: "Manufacturers shall indicate on the radio equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted or, where the size or nature of radio equipment does not allow it, on its packaging, or in a document accompanying the radio equipment. The address shall indicate a single point at which the manufacturer can be contacted."

CE Mark: Two of the products displayed the correct CE mark, i.e. indelible and larger than 5mm. DoC: None of the products were accompanied by a DoC. Traceability: None of the devices displayed the manufacturer's name and address as required above.

Technical Testing

ComReg engaged the services of Compliance Engineering Ireland[7] to test the products to the ETSI standard ETSI EN 300 328 V.2.1.1 (2016 – 11) – "Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU". - Article 3.2 - "Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference".

[6] This is a document provided by the manufacturer declaring that the product has undergone and passed conformity assessment procedures. If it doesn't accompany the product, there should be a reference on the packaging as to where it can be found online.

[7] Compliance Engineering Ireland are a Notified Body under the RED and are accredited to undertake testing under the RED.

The below parts of the harmonised standard are used to demonstrate the presumption of conformity with spectrum aspects of the RED:

• Section 4.3.2.2 – RF output power and

• Section 4.3.2.9 – unwanted emissions in the spurious domain.

Technical test results Section 4.3.2.2: All three products passed this test. Section 4.3.2.9: Two products passed, and one failed this test.

Summary and Further Actions:

All three products failed the administrative checks and two of the three products failed the technical tests. Under Regulations 35 of the RE Regulations – 'Formal Non-Compliance', ComReg is in the process of giving directions to the relevant economic operators to take specified measures to address the non-compliance observed.

2.3 Targeted EU Market Surveillance Campaign – L.E.D Lights

2.24 In 2019 ComReg contributed to the EMC AdCo's 12th EU joint cross-border market surveillance campaign on Light Emitting Diode (LED) products.

Campaign Background

2.25 In 2011, EU Member States undertook the 4th Electromagnetic Compatibility ("EMC") market surveillance campaign on Light Emitting Diode ("LED") lighting products[8] used for domestic use e.g. strip lighting for cupboards, light bulbs, recess lights. The results highlighted low levels of compliance - overall, only 17.3% of 168 products accessed in 18 countries were in line with both technical and administrative requirements of the EMCD.

2.26 The 44th EMC AdCo meeting decided that the 12th joint cross-border EMC market surveillance campaign would assess the compliance of LED lighting products intended for in-home use for illumination. A code of practice was drawn up by the AdCo detailing scope of the project and timelines for completion. For the purposes of this campaign LED luminaires products group included luminaires with one or more LED lamps; LED Retrofit Lamps (LED bulbs, LED spots, LED candles, LED capsules or LED tubes), LED strips and LED panels.

2.3.1 Case Study - EU joint market Surveillance Campaign on L.E.D light

Explanatory Box 2: EU Joint Market Surveillance Campaign on LED lights

EMC is the ability of electrical equipment and systems to function acceptably within the electromagnetic environment, by limiting the unintentional generation, propagation and

[8] Lightning using LEDs technology consists of the utilization of light-emitting diodes. A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode that emits light when activated. Source: EMC Code of Practice on the 12th Market Surveillance Campaign

reception of electromagnetic energy which may cause unwanted effects such as EMI or even physical damage in operational equipment.

Purpose of the Campaign

The purpose of the campaign was to assess the compliance of several **samples taken from the market with the essential requirements of the EMC Directive 2014/30/EU.**

All electric devices or installations emit electromagnetic energy. When these devices are installed and used near **each other they can generate unwanted effects such as electromagnetic interference (EMI).**

The goals and objectives of the campaign were:

- **to increase knowledge of the LED lighting industry;**
- **to determine the exact administrative and technical levels of compliance of the sampled products;**
- **to improve cooperation and information exchange between Market Surveillance Authorities ("MSAs");**
- **to apply the measures of the EMC Directive 2014/30/EU (including safeguard procedure);**
- **to propose further actions;**
- **to take appropriate compliance actions to rectify non-compliance;**
  to raise awareness of manufacturers'; importers'; distributors'; and economic operators' obligations under the EMC Directive and Irish Regulations; (2014/30/EU and S.I. No.69 of 2017).
- **to compare results with the 4th EMC campaign from 2011;**
- **to use the new ICSMS[9] DRPI and become familiar with it.**

ComReg participated in this campaign and purchased 5 LED lighting products.

Two products were purchased online and three were purchased from retailers.

All the LED lighting products purchased were within the scope of the harmonised standard EN 55015 "Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment"[10]. These standards are supported by the European Standards Organisation -ESTI.

Each product was assessed for both administrative and technical compliance with the EMC Directive. Initial results were uploaded to ICSMS, along with test lab reports.

The final results will be presented at **the next EMC 49 AdCo meeting scheduled for November 2020 in Copenhagen the EMC AdCo.**

Administrative Compliance Checks

The products were checked for the following:

- **CE marking;**
- **Declaration of Conformity ('DoC');**
- **Traceability (name or registered trademark and address of the manufacturer/importer) and**
- **Intended use**

[9] ICSMS – The Information and Communication System on Market Surveillance is an IT platform to facilitate communication between market surveillance bodies in the EU and in EFTA countries.

[10] https://www.etsi.org/about/

There was a wide variation in compliance aspects of the products in the following administrative checks

- **CE mark: 3 out of the 5 products assessed displayed the correct CE mark.**
- **DoC: The DoC was available for 2 of the 5 products.**
- **Traceability: Only 1 of the products met the traceability requirements in line with Articles 7(6) and 9(3) of the Directive.**
- **Intended use: 2 of the 5 products had information about the intended use of the product in line with Article 18 of the Directive**

Technical Testing

The technical testing involved the use of the services of Compliance Engineering Ireland to test the products against

- **EMC standards for radio frequency emissions – EN 505015:2013 + A1:2015 *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment;***
  &
- **EN 61000-3-2:2014 *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).***

Technical Tests Results

- **Conducted emissions: 4 of the 5 products were compliant with the limits as set out in the relevant standard.**
- **Radiated Emissions: 3 of the 5 products were compliant with the limits as set out in the relevant standard.**
- **Fluctuating Harmonics: 2 of the** 5 products **tested were compliant with this aspect of the technical testing.**

Summary

Each of the 5 products ComReg tested as part of the 2019 campaign demonstrated some level of non-compliance with the EMC Directive. The results of the checks and tests were uploaded to ICSMS.

Under Article 40 of the EMC Directive – 'Formal Non-Compliance', ComReg is in the process of giving directions to the relevant economic operators to take specified measures to address the non-compliance concerned

2.4 Working with the Customs division of the Office of the Revenue Commissioners[11]

2.27 ComReg has again worked closely with the Customs Division of the Office of the Revenue Commissioners ('Customs') this year. SII staff met with key personnel at the Customs Depot at Dublin Airport and visited both Portlaoise

[11] https://www.revenue.ie/en/corporate/information-about-revenue/role-of-revenue/organisation-structure-divisional-roles.aspx

(until its closure) and Athlone Mail Centres. The flow chart below sets out outlines the interaction between ComReg and Customs Authorities in respect of market surveillance of products.

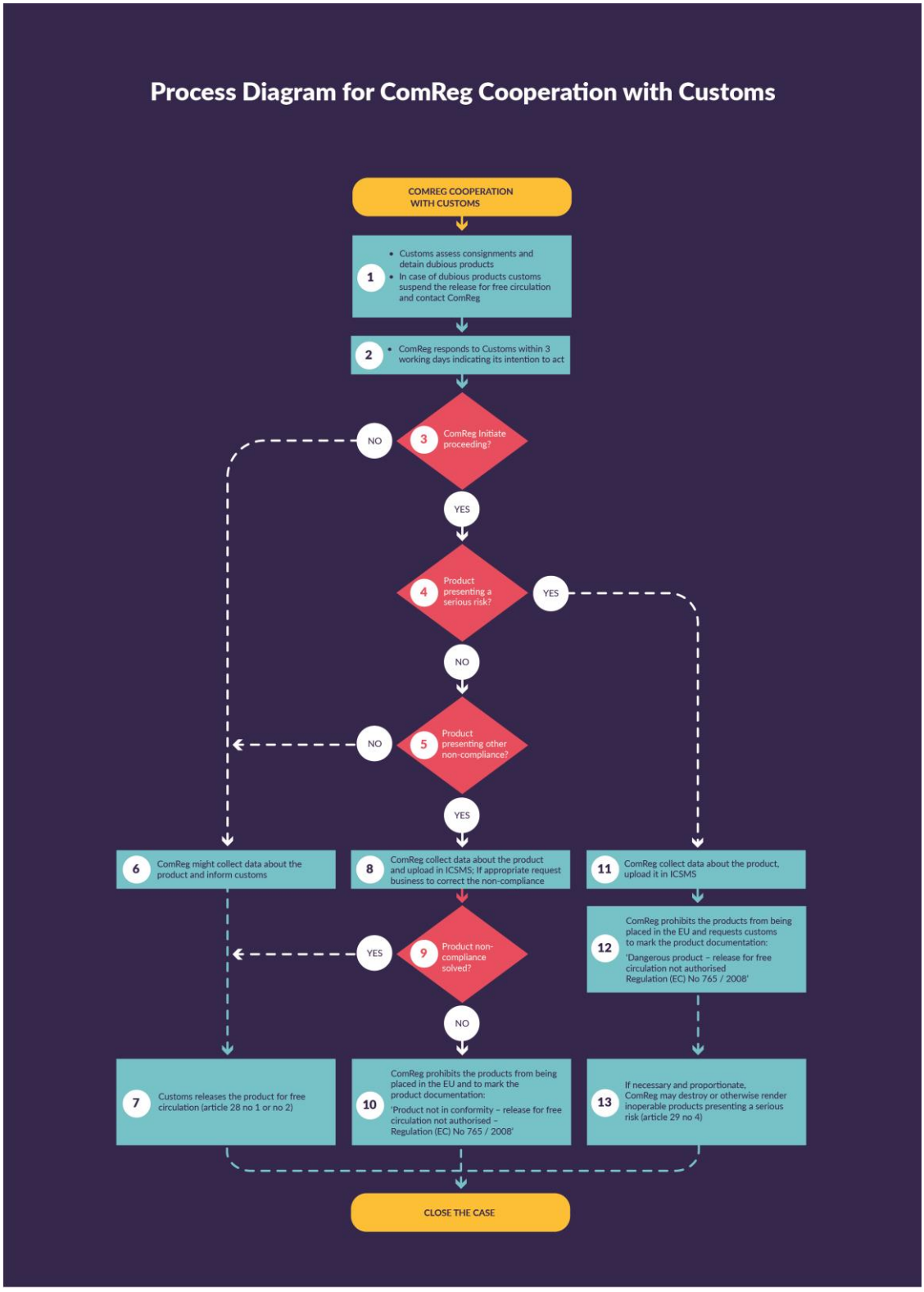

Figure 2. Flowchart of ComReg's relationship with Customs.

2.28 SII staff maintain regular contact with Customs and regularly provide details of non-compliant products which are being imported from Third Countries. These products are intercepted by Customs and forwarded on to ComReg for action as appropriate.

2.29 In the coming year ComReg and Customs have scheduled a number of training courses and presentations to ensure that staff are fully informed regarding the types of non-compliant devices to be seized for assessment of compliance by ComReg.

Statistics of non-compliant devices seized

2.30 With reference to Figure 3 below, since July 1st, 2019 SII has seized a total of 695 non-compliant products with the assistance of Customs officials. WiFi repeaters still represent the largest volume of non-compliant products entering to the market.

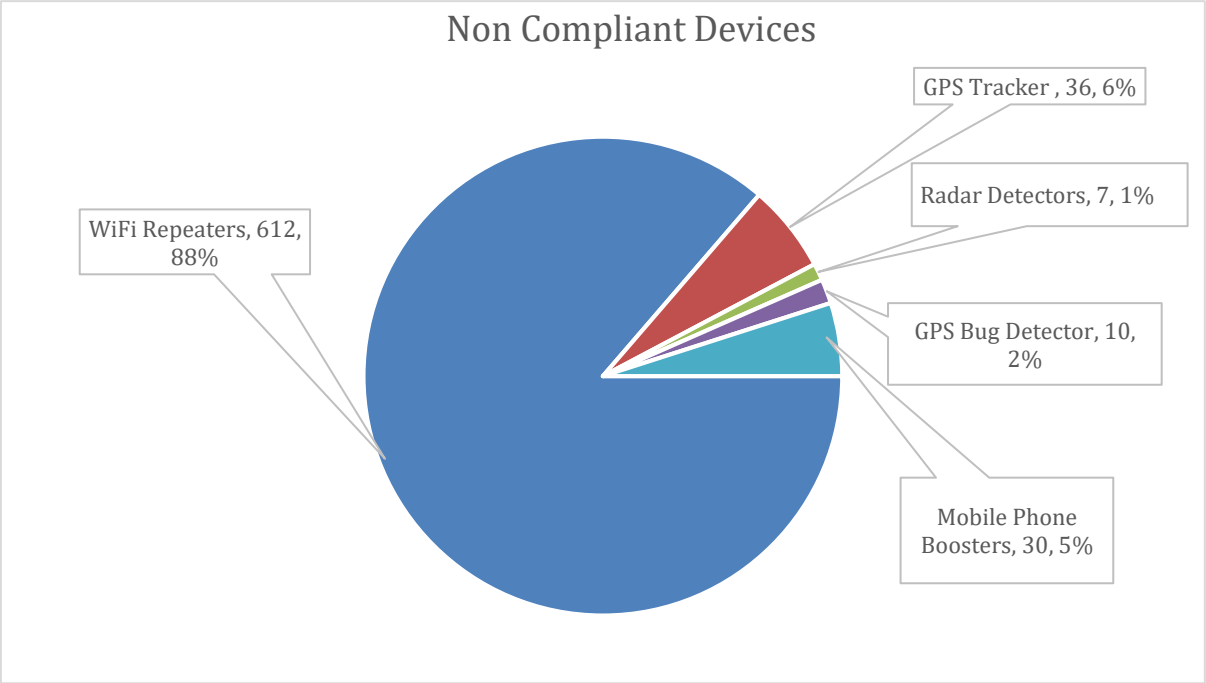

Figure 3. Breakdown of items seized with the assistance of customs (2019/2020)

2.31 Over the last 3 years, as shown in Figure 4, there has been a steady increase in the number of devices seized and removed from the market by ComReg with the assistance of Customs. This is due to improved communication and training between SII and Customs and continual refinement and improvement of systems used by both parties.

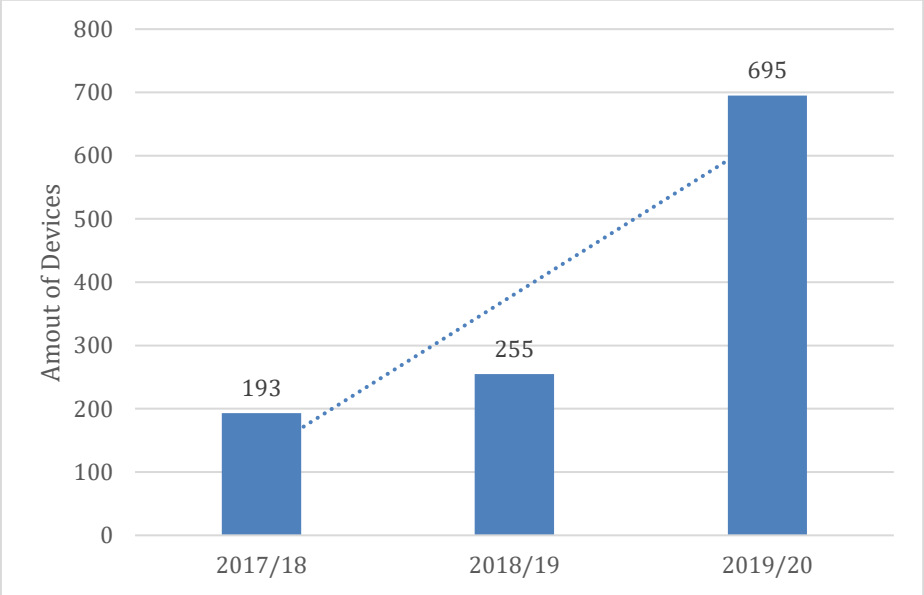

Figure 4. Number of devices seized by customs over the last 3 years.

Customs in a Post Brexit Environment

2.32 The following is ComReg's current understanding:

- The United Kingdom left the EU on Friday **31 January 2020** following agreement on the final text of the UK-EU *Withdrawal Agreement* on 17 October 2019, as unanimously endorsed by the European Council;

- The Withdrawal Agreement includes a new *Protocol* on Ireland/Northern Ireland. It was conceived as a stable and lasting solution and will apply alongside any agreement on the future relationship between the EU and the UK;

- Although the UK will no longer be a member of the EU, the Withdrawal Agreement provides for a *transition period up to 31 December 2020*;

- During this transition, EU rules and regulations will continue to apply to the UK, and the UK will remain part of the EU's Single Market and Customs Union;

- The new *Protocol aims to avoid a hard border* on the island of Ireland and aims to safeguard the integrity of the Single Market and Ireland's place in it. It allows for a more permanent set of arrangements to address the challenges of Brexit on the island of Ireland;

- The *Protocol will be in place from the end of the transition period*, irrespective of the outcome of the EU-UK future relationship negotiations.

- The Protocol provides that Northern Ireland will remain in the UK customs territory and will also remain aligned to a limited set of Single Market rules (to avoid a hard border on the island of Ireland);

- Northern Ireland remains legally in the UK Customs Territory and part of any future UK trade deals. This may create a *de facto customs border* down the Irish Sea insofar as Great Britain and Northern Ireland are considered a Third Country for customs purposes; [12]

- The EU and the UK also agreed, on 17 October 2019, to a *Political Declaration* setting out the framework for the EU-UK future relationship. One of the key issues addressed in the Political Declaration is the need for a strong level playing field, to *protect fair and open competition and to prevent diverging standards*;

- It was possible to extend the transition period for up to one or two years, if the Joint Committee before July 2020 had adopted a decision to do so (Article 132, Withdrawal Agreement). But no such decision was taken and the UK had it made clear in advance that it did not want an extension.

2.33 It is unclear at this time what actions ComReg will need to take to manage or address changes caused by BREXIT and what the impact will be on ComReg's market surveillance function and ComReg generally.[13]

2.6 The Year Ahead

2.34 In the coming year ComReg will:

- continue to conduct proactive and reactive market surveillance to remove non-compliant products from the market;

- where appropriate, SII will participate in EMC and RED Market Surveillance Campaigns;

- forge new relationships with stakeholders and develop and deepen its existing relationships with key decision makers as part of its market surveillance activities;

- continue to work with the Customs Authorities to further develop our existing relationship and communications strategy regarding the seizing of non-compliant devices in a post- Brexit environment; and

- develop further our strategies regarding the Wi-Fi repeater issue.

[12] The term 'third country' is used in the Treaties, where it means a country that is not a member of the European Union. - https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary

[13] Sources: https://www.dfa.ie/brexit/brexit-negotiations/ and www.gov.ie/en/publication/a7ba02-brexit-info

3 Radio Frequency Interference Investigations

3.1 Radio frequency interference (RFI) describes radio frequency signals that can cause harmful interference to legitimate electronic communications services, whether entirely, 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.

3.2 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 devices, including for example lighting 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.

3.1 Update to RFI complaint reporting

3.3 In the period under review, ComReg introduced a revised reporting protocol for all RFI complainants and a new process for closing complaints on completion of its investigation.

3.4 ComReg wants to make the very best use of its limited resources and so the revised RFI reporting protocol entails complainants providing relevant in-depth information to support ComReg in its triage and prioritisation process.

3.5 This protocol makes clear that in order for ComReg to investigate a report of RFI, it must firstly be satisfied that the interference is 'harmful', outside of the complainants control and that all reasonable steps have been undertaken by the complainant to minimise the effect.

Revised Radio Frequency Interference Complaint-Classification System

3.6 As outlined in the SII Annual Report 2018-2019, ComReg committed to carry out a public consultation on the categorisation and classification of Radio Spectrum Interference Complaints.

3.7 ComReg completed this consultation with the publication of ComReg document 19/108 and Response to Consultation document 20/62 in July 2020.

3.8 The previous classification system placed an undue emphasis on the identity of the complainant rather than the impact the reported interference had on the complainant's ability to provide service. ComReg sought to address this, among other things, by placing emphasis on the nature and impact of the reported interference and the complainant's ability to continue to provide services.

3.9 The consultation also set out ComReg's proposals for the revision of the current radio frequency complaint classification process.

3.10 Following consultation, a new classification system has been introduced along with revised complaint response times. ComReg will review the effectiveness of these new arrangements going forward. Further details of these new arrangements can be found in Document 20/62 or Annex 2 of this document.

3.2 Actions to Prevent RFI

3.11 The radio environment has greatly changed in recent years with the placement of an ever-growing range of wireless devices on the market utilising a broader range of frequencies. This has led to far more complex RFI cases, requiring more time and resources to conclude cases. Explanatory Box 3 below provides a case study of this in practice.

3.12 In order to foster a more proactive approach to RFI complaints ComReg established the SII Operators Forum in 2019. The Forum aims to deepen engagement between ComReg and licensees by discussing topics of shared interest and future trends. It met twice during the current reporting period in September and December 2019 and was attended by a wide range of stakeholders including the mobile network operators, 2RN, An Garda Siochána and Tetra Ireland.

3.13 The role of the Forum is to

- provide an opportunity to discuss and consider forward-looking topics, to ensure that ComReg's SII 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.

3.14 The Forums have proven successful and ComReg looks forward to the ongoing engagement and participation of its members. Government restrictions imposed as a result of the Covid-19 pandemic resulted in the cancelation of forum meetings scheduled for March and June 2020. However, ComReg expects to hold future for meetings either in a virtual or physical format, as circumstances allow.

Explanatory Box 3: - A Case Study – RFI caused by non-compliant HDMI cables

During this reporting period ComReg closed out a complaint of RFI where the source of interference was identified as HDMI cables that were widely used in an office setting located in Dublin.

The harmful interference was reported by a mobile network operator as affecting six sites in an area of approximately 2km radius. The screen shots provided with the complaint report showed that the bandwidth of the interfering signal was 5MHz. It was not possible to identify a probable cause or source of the harmful interference from the information provided. When ComReg visited the site of the interference the source of the interference was not immediately clear as there was no offending radio equipment operating on the premises. Following several site visits ComReg identified that the interference source was most likely to be the cables that were connecting computers and monitors being used onsite. SII took a workstation consisting of a computer, monitor and all the associated cables from the site for assessment by a certified testing house. The tests confirmed that the DVi/Display port adopter cables were emitting strong RF signals at the affected frequency at the termination connections.

Several potential solutions were investigated and ultimately a VGA cable with a display port adaptor, was identified as the most appropriate solution which was subsequently rolled out.

The conclusion of the investigation illustrated that electronic devices which are connected with HDMI cables can create emissions on 891 MHz that in turn can interfere with to the uplink of a mobile network operating nearby.

3.3 ComReg Presence at Major Events

3.15 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.

3.16 The likelihood of interference arises while each event is being set up 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 proactively address issues or identify potential ones.

3.17 Due to the Covid-19 pandemic, many events scheduled for 2020 have been postponed or cancelled. However, the two largest events in this reporting period that were supported by the SII team were:

- Electric Picnic (30th August - 1st September 2019); and
- UEFA 2020 qualifier match (Ireland Vs Denmark on 18 November 2019).

3.4 Radio Frequency Interference Statistics

3.18 ComReg received 115 complaints of RFI during the period 1 July 2019 to 30 June 2020, representing a 23% year on year increase. Figure 5 illustrates the year on year change in the number of reported cases of RFI.

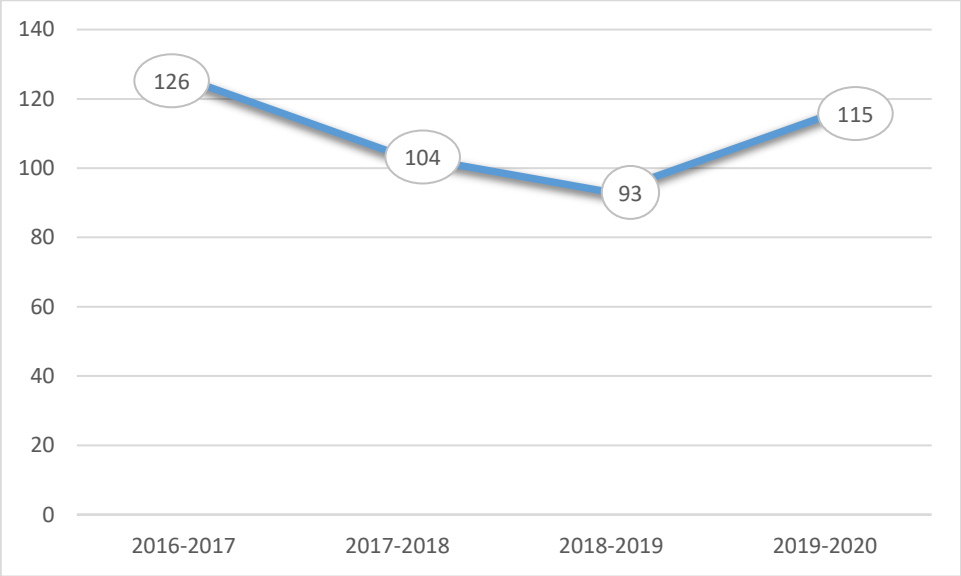

Figure 5. Number of reported interference complaints received each year.

3.19 During the reporting year, ComReg prioritised reports of RFI under its previous classification system which was as follows:

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 licenced 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 licenced user but does not render the licenced 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 licenced 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

3.20 As can be seen from Figure 6 below more than 85% of interference complaints fell into Class 3.

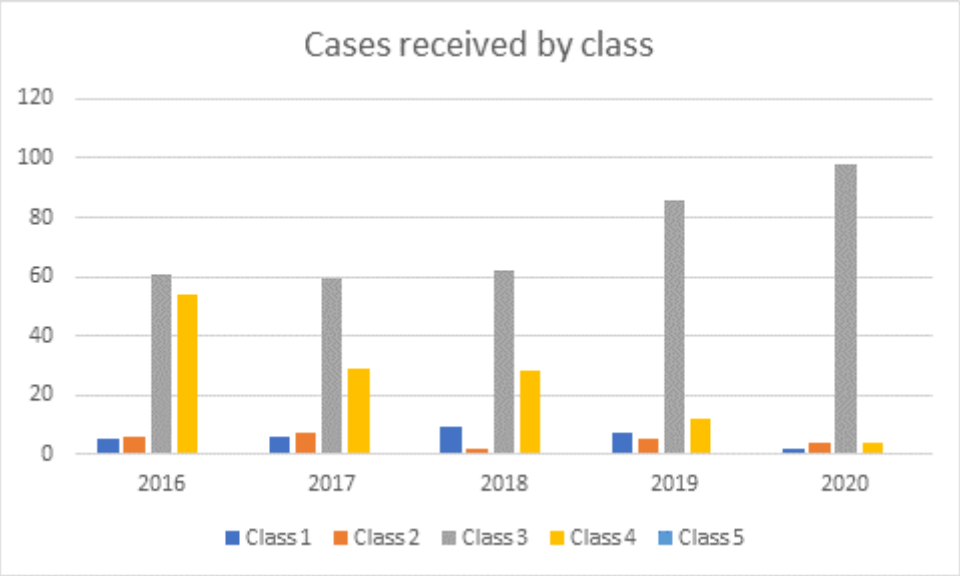

Figure 6. Interference cases received per class.

3.21 The service most affected by harmful interference is mobile networks with the biggest source of interference being mobile phone boosters, see Figure 7 below.

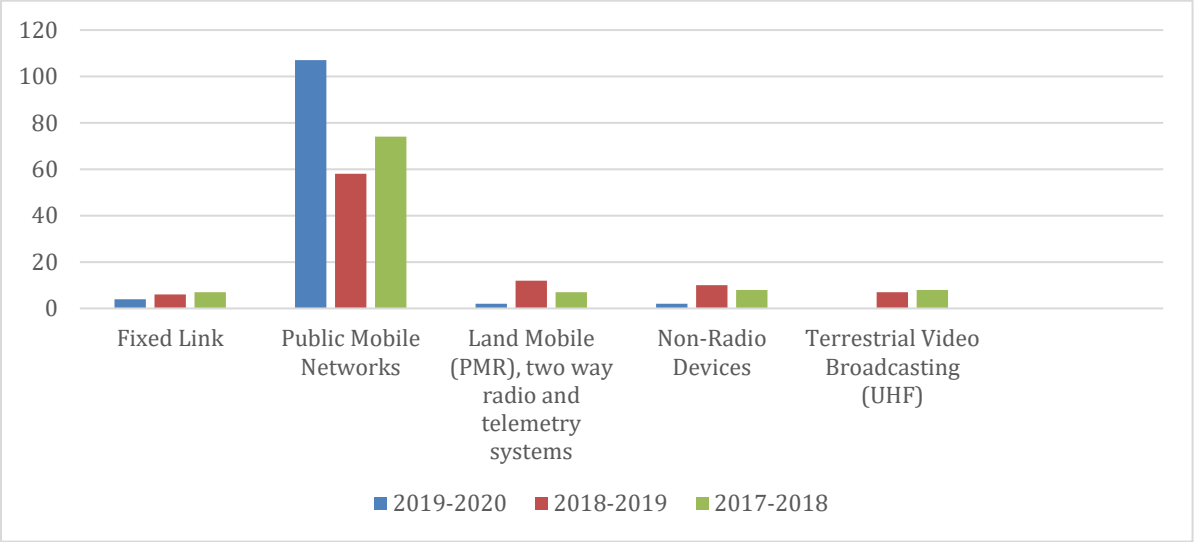

Figure 7. Complaints investigated over the last 3 years.

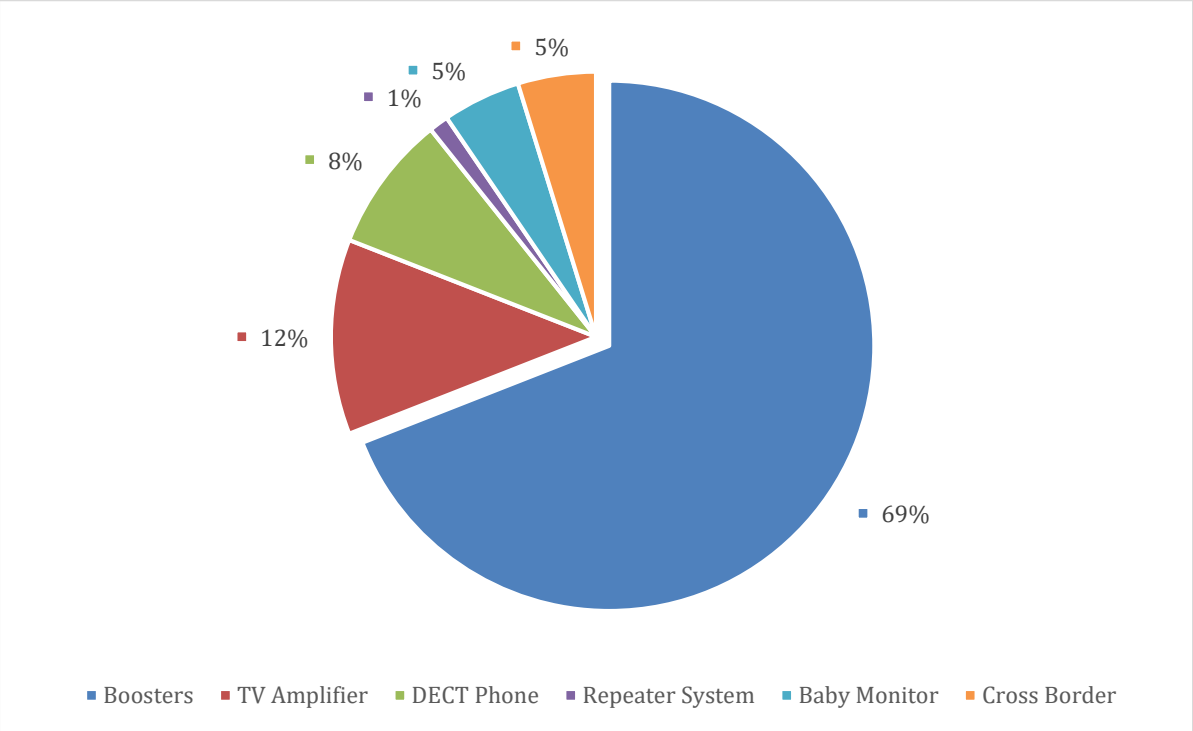

Figure 8. Interference sources 1 July 2019 to 30 June 2020.

3.22 Figure 8 above illustrates that mobile phone boosters continue to represent the majority of sources of interference to service providers.

3.23 ComReg observes that the RFI experience in Ireland is reflective of that elsewhere in Europe. Each year the CEPT subgroup FM22[14], which is

[14] The responsible subgroup is ECC FM22 – see www.cept.org/ecc/groups/ecc/wg-fm/fm-22/client/introduction/

responsible for monitoring and enforcement activities, publishes its Annual Interference Statistics Questionnaire for Reported Cases[15].

3.24 This report shows that in 2019 across Europe mobile networks are the services that report most complaints of RFI accounting for 58% of all reports. In addition mobile phone boosters (referred to in the report as repeaters/amplifiers) are also the most common cause of interference identified by national regulatory authorities across Europe, see the graphs in Figure 9 and Figure 0 below.

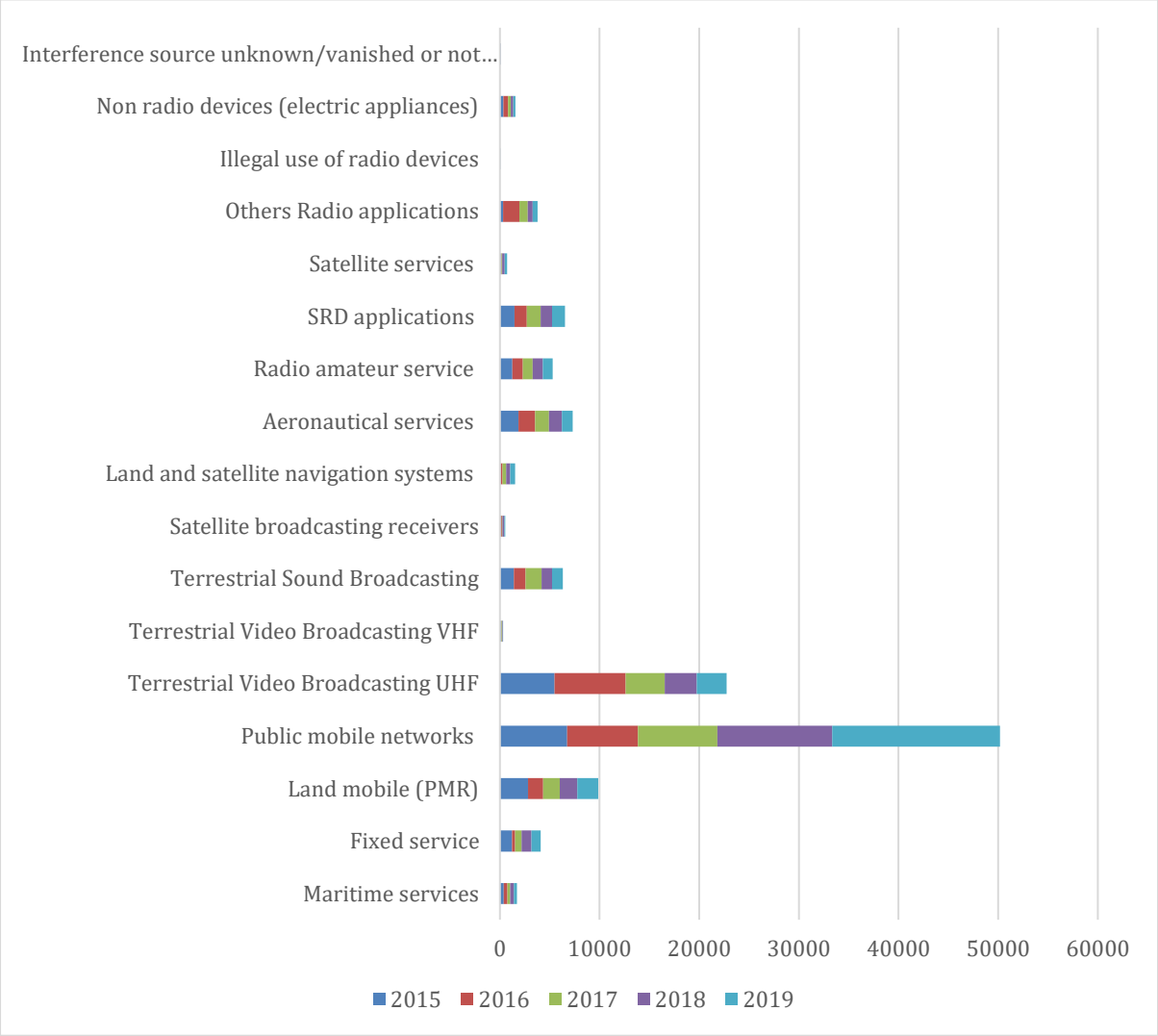

Figure 9. Number of interference cases into radio services (victims) in 2019

[15] See - https://cept.org/ecc/groups/ecc/wg-fm/fm-22/client/introduction/annual-radio-interference-statistics-and-special-interference-cases/

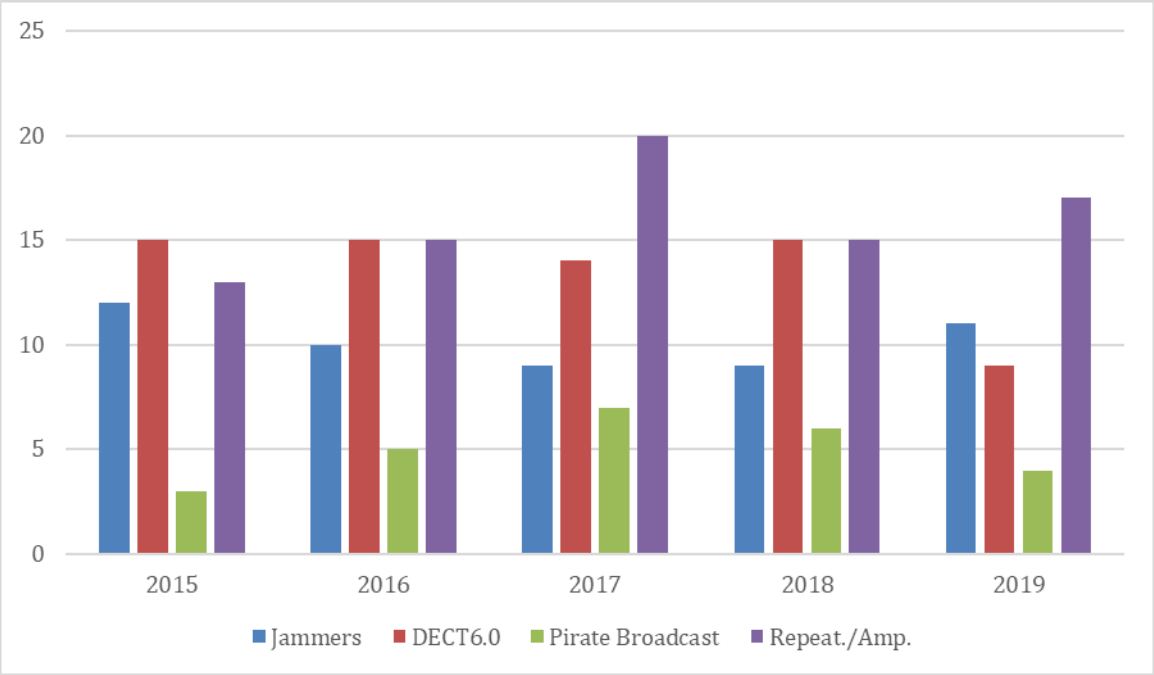

Figure 10. FM22 statistics on interference sources

3.5 Mobile Phone Boosters

3.25 The use of illegal mobile phone boosters continues to be a significant cause of interference to mobile networks. As can be seen from Figure 1 earlier; mobile phone boosters account for many of the products removed from online platforms during this reporting year.

3.26 Furthermore, as can be seen from Figure 9, over 69% of investigations of harmful interference to mobile networks carried out by ComReg during this reporting year can be attributed to these devices. Figure further illustrates that of the 115 complaints of RFI received during this reporting year, 107 of were from mobile network operators, with Three Ireland accounting for the most of these.

3.27 Since 2018 ComReg has undertaken several initiatives to address the matter of illegal mobile phone boosters including:

- In 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[16];
- Created a dedicated webpage, www.comreg.ie/repeaters, with detailed consumer information on lawful mobile phone repeaters[17];

[16] SI no.283 of 2018 Wireless Telegraphy Act 1926 (Section 3) (exemption order of Mobile Phone Repeaters) Order 2018

[17] See www.comreg.ie/consumer-information/mobile-phone/mobile-phone-repeaters/

- In 2019 ComReg produced an infographic[18] and animation[19] to raise awareness on permitted mobile phone repeaters in Ireland;

- In 2019 ComReg conducted an information campaign in both the print and on social media using the infographic and animation;

- During January and February of 2020 ComReg conducted a further social media campaign[20] to raise awareness of permitted mobile phone repeaters; and

- In February 2020 ComReg initiated a proactive market surveillance campaign aimed at removing illegal mobile phone boosters from sale on several online platforms.

3.28 ComReg notes that while it has taken a very proactive approach to preventing illegal mobile phone boosters from entering the market, this has not been reciprocated by the mobile network operators ("MNOs") whose networks are adversely affected by these illegal devices. Therefore, in March 2020 ComReg asked all mobile network operators to take the following steps:

i. Make information available on its website to consumers on how to improve indoor mobile phone reception;

ii. Place a link on its website to the mobile phone repeater page on ComReg's website www.comreg.ie/consumer-information/mobile-phone/mobile-phone-repeaters/

iii. Make the mobile phone repeaters infographic available to consumers in its retail outlets; or

iv. Retweet any of ComReg's mobile phone repeater information.

3.29 At the time of going to print ComReg notes, with some disappointment, that eir and Vodafone have not taken any of these steps while Three has taken only steps i and ii.

3.30 This limited activity on the part of the MNO's would suggest that interference complaints arising from mobile phone boosters is generally of a very low priority for them. This is important for ComReg to understand given it must make the most effective use of its limited resources. Going forward, ComReg

[18] www.comreg.ie/consumer-information/mobile-phone/mobile-phone-repeaters/

[19] www.comreg.ie/consumer-information/mobile-phone/mobile-phone-repeaters/

[20] https://www.youtube.com/watch?v=LSg8FzCQxmY and https://www.youtube.com/watch?v=oGNNkW00wDI

will take complainant activity or indifference into account when determining the priority afforded to interference cases generally.

3.7 The Year Ahead

3.31 ComReg will monitor the implementation of the new RFI classification system and the associated response times over the next 12 months and consider their continued appropriateness going forward.

3.32 With so many special events postponed and cancelled in this reporting period, ComReg expects that many of these events may take place next year and thus, will base its resource planning on advance information regarding any events that proceed in the 2020/21 period.

4 Radio Spectrum Monitoring

4.1 Spectrum monitoring serves as the eyes and ears of spectrum management and is necessary in practice because, authorising the use of the radio spectrum resource alone, does not ensure that it is being used as intended.

4.2 Any discrepancy in use may be due to a number of factors including the complexity of the equipment, interaction with other equipment, a malfunction of equipment, or deliberate misuse. This problem can be further exacerbated due to the accelerating proliferation of terrestrial wireless and satellite systems and of equipment that may cause harmful interference. A spectrum monitoring system provides a method of verification and “closes the loop” on the spectrum management process.

4.3 The purpose of spectrum monitoring is to support the spectrum management process in general, including frequency assignment and spectrum planning functions. Specifically, the goals of monitoring (not necessarily in priority order) are to:

- assist in the resolution of electromagnetic spectrum interference, so that radio services and stations may coexist, reducing and minimizing the resources associated with installing and operating these telecommunication services while providing economic benefit to the spectrum users through access to interference- free telecommunication services;

- provide valuable data for the spectrum management process in respect of the actual use of frequencies and bands (e.g., channel occupancy and band congestion), verification of proper technical and operational characteristics of transmitted signals (license compliance), detection and identification of illegal transmitters and potential interferers, and the generation and verification of frequency records;

- gather intelligence in relation to unlawful spectrum usage; and

- certify the proper technical and operational characteristics of transmitted signals i.e. assists in the assessment of compliance with conditions of the rights of use of the radio spectrum resource.

4.4 In ComReg, the task of spectrum monitoring is complementary to, and supportive of, other aspects of spectrum management including, Radio Frequency Investigations (RFI).

4.1 Methodology, Equipment and Facilities

4.5 ComReg has developed a systematic programme of remote measurements which provides meaningful data about spectrum usage through spectrum occupancy measurements that describe utilisation rate of various spectrum bands of interest.

4.6 In recent 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.

4.7 This has facilitated a reduction in the time taken to respond to radio frequency interference complaints as staff no longer have to travel to specific locations in order to confirm the validity of complaints received but can instead do much of this remotely before taking local action.

4.1.1 Monitoring of the 400 MHz Frequency Band

4.8 In November 2019 ComReg completed the award[21] of the 400 MHz band in which it granted spectrum rights of use for 2 × 4 MHz of spectrum in the 410 – 414 MHz / 420 – 424 MHz portion of the band. All the spectrum was awarded to ESB Networks DAC.

4.9 In April this year, using the remote measurement system, ComReg conducted 82 long term measurements to ensure that there was no unauthorised use of the awarded spectrum and that the licensee could utilise the spectrum to its full potential.

4.10 Four sites were selected to cover as large and diverse a geographical area as possible. The sites used were Dublin Airport, One Docklands Place (where ComReg is located), Athlone and Cork Airport. Measurements of spectrum occupancy were performed over 13 separate days between these four locations. Scans were arranged to obtain a full 24-hour spectrum monitoring view of the use of the spectrum with longer scans being made during the normal hours of business where, in ComReg's experience, the increased likelihood of interference occurring due to mobile interferers occurs.

4.11 A typical sample measurement of the band 400 – 430 MHz, taken on 21st April 2020 between the hours of 10:00 and 11:00 at the Dublin Airport monitoring node, can be seen in Figure 21.

[21] See ComReg 19/99 – Information notice: Results of the 400 MHz band spectrum award (Smart Grid)- published 5 November 2019.

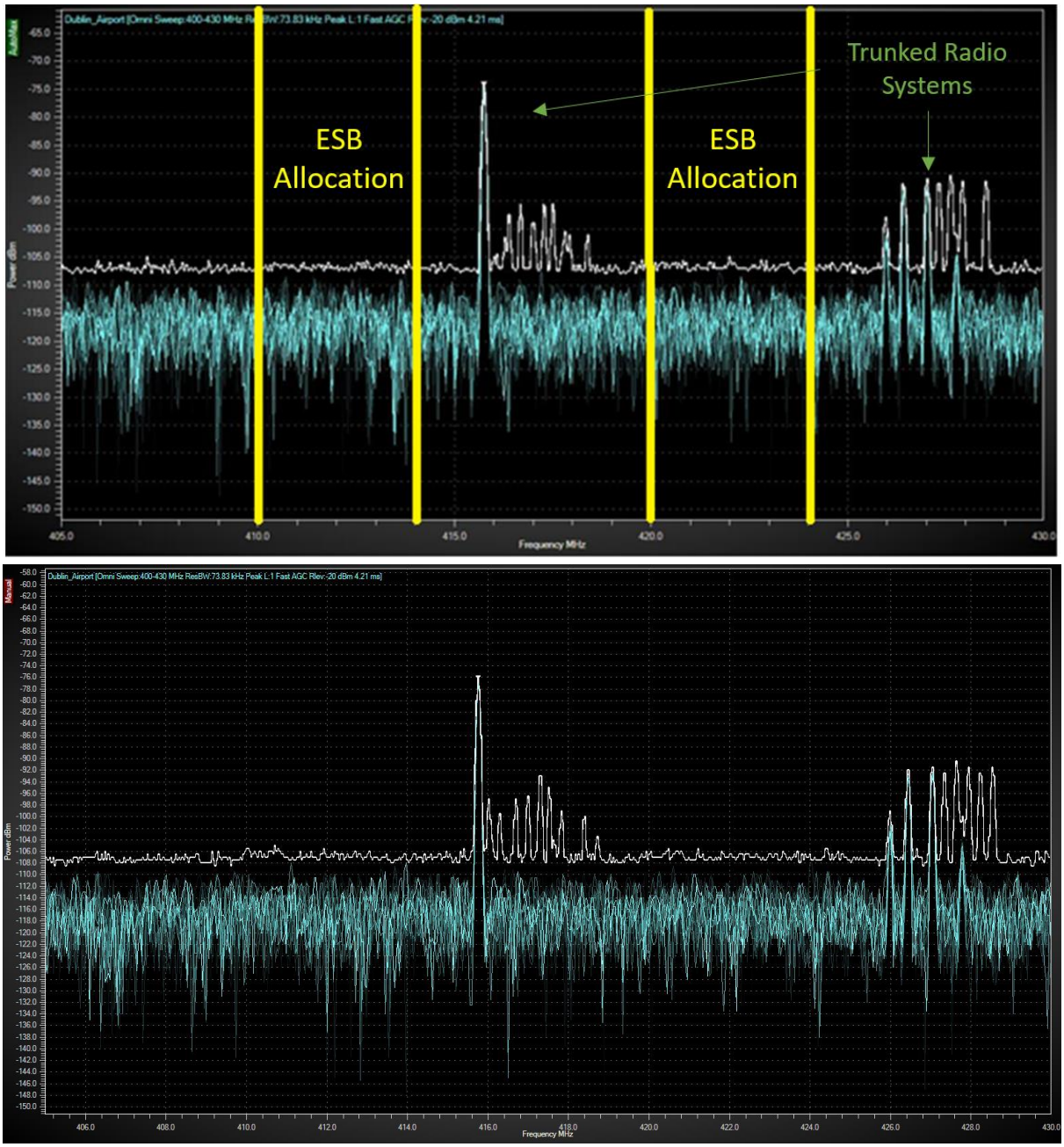

Figure 21. Spectrum occupancy measurement from Dublin Airport (10:00 - 11:00) 21st April 2020

4.12 This measurement illustrates the expected high level of activity in the adjacent Trunked Radio Systems[22] but there were no discernible signals measured in the spectrum assigned to ESB Networks DAC. With the measurement settings used the maximum noise floor power level in the ESB assignments was -106dBm with an average noise floor power level of -118dB.

[22] These are commercial trunked radio systems commonly used for fleet management and communications and are more prevalent in the Dublin area than in other areas of the country.

4.2 The Year Ahead

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

- Following a public tender, begin the process of replacing the National Monitoring Network. The network will be made up of both fixed and mobile monitoring stations and will be a multi-year project; and
- Assess the use, both legally and illegally (if any), of the 700 MHz, the 2.3 GHz and the 2.6 GHz bands. These three bands are scheduled for release as part of ComReg's proposed multi band spectrum award[23].

[23] See www.comreg.ie/industry/radio-spectrum/spectrum-awards/proposed-multi-band-spectrum-award/

5 Compliance and Enforcement

5.1 Compliance and enforcement actions come into effect whenever illegal activity affecting the radio spectrum resource is identified. Spectrum compliance involves checking that licensees are complying with the conditions of their respective licences.

5.2 Enforcement action arises in the event of any finding of non-compliance. Where justified, and exercised in a proportionate manner, enforcement may include the removal of unlicensed apparatus via a search and seize operation.

5.3 Most of this work is reactive in its nature (having been minimised by the proactive interventions outlined earlier) and supports related activities in the areas of market surveillance, RFI investigations and spectrum monitoring.

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

- Seizing of non-compliant equipment;
- Verbal warnings of those carrying out or supporting illegal activities
- Written warning to those carrying out or supporting illegal activities
- Regulation 25(1) mandates ComReg to inspect apparatus and fixed installations, where appropriate – see Annex 1 for details
- Authorised Officer visits as part of an investigation to find the source of the RFI or the illegal use of the spectrum
- Search warrant executions to access premises to search for and seize equipment and
- Criminal prosecutions to see court mandated sanctions to compel compliance and the law.

5.1 Enforcement Activities

5.5 Since March 2020, the restrictions imposed by the Covid-19 pandemic has limited SII's ability to carry out several planned search and seize operations within this reporting period. However, in addition to the work undertaken in support of market surveillance (Chapter 2) and RFI (Chapter 3) the following actions are representative of the work undertaken in the reporting period:

- Two actions against unlicensed broadcasters in Dublin. These actions lead to the seizure of unlicensed apparatus for wireless telegraphy connected with the transmission of illegal broadcasts under the 1926

Wireless Telegraphy Act. In both cases ComReg is now pursuing prosecution and acknowledges the ongoing support of An Garda Síochána in the execution of these activities;

- One action against an PMR[24] user operating in the wrong frequency and causing interference to a PMR site at Dublin Airport. ComReg's investigation found the interference to be unintentional and no prosecution was pursued as the interference was resolved;

- A NIR survey identified an unusual transmitting source in the 2.1 GHz band (the 3G band) – this was found to be a non-compliant baby monitor which was confiscated[25]; and

- Interference in the Haematology laboratory at the Mater University Hospital causing the three NX-10 Sysmex blood analysis machines to incorrectly analyse and count blood samples. Measurements determined that the interference was coming from inside the hospital and was localised to one floor and one corridor in the hospital. As the source of interference was not affecting any other parties, was internal to the hospital and due to any one of an array of complex medical equipment, the final sourcing and removal of the interference was left for the hospital and its contractors to resolve.

5.6 To undertake these and other actions during the year in review ComReg has:

- sought two warrants obtained from a District Court Judge and executed;

- seized more than 30 pieces of non-compliant equipment or equipment used to conduct unlicensed broadcasting;

- Issued five written warnings; and

- Initiated two prosecutions.

5.2 Non-Ionising Radiation (NIR) Surveys

5.7 Licensees with a Wireless Telegraphy Licence and those operating under a General Authorisation[26] for the provision of an electronic communications networks and/or services must ensure that public exposure to non-ionising radiation (NIR) emissions from transmitters are within the limits set by the

[24] PMR = Private Mobile Radio – Two way radio systems for private usage.

[25] See footnote 10 on page 11 of www.comreg.ie/media/2019/10/Cork-Irish-Independent-Park-Tramore-Road-Ballyphehane-1978_7-1.pdf

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

International Commission on Non-Ionising Radiation Protection (ICNIRP)[27], as endorsed by the World Health Organisation (WHO), the European Commission and the Environmental Protection Agency (EPA).

5.8 Every year ComReg measures NIR levels in public areas at a minimum of 80 different sites, located throughout Ireland. These are chosen based on demographic and geographic factors. In this reporting period, 81 sites were surveyed. To date, over 1400 sites have been surveyed and NIR levels at all sites have been found, without exception, to fall well below the international limits for public exposure set by ICNIRP.

5.9 ComReg notes that revised ICNIRP guidelines were published in March 2020 and, on foot of same, ComReg has revised the methodologies by which it conducts NIR surveys to take account of the new guidelines. This is published in ComReg Document 08/51R4[28].

5.10 ComReg makes all its NIR measurement reports available online at www.siteviewer.ie.

5.11 Further information regarding NIR, ComReg's role in relation to NIR, along with information on the roles of other public bodies, can be found on ComReg's website[29].

5.3 The Year Ahead

5.12 In the coming year ComReg will:

- continue to take action against illegal use of the radio spectrum, including but not limited to illegal broadcasting;
- undertake NIR surveys at a minimum of 80 sites;
- commence a programme surveying the spectrum bands used for Private Mobile Radio (PMR) services. This will support ComReg's licence cancellation process, thereby ensuring that transmitters and other equipment have been removed from service; and
- commence a project to address interference to meteorological (weather) radars, caused by what is believed to be non-compliant RLAN equipment. In preparation, ComReg has engaged with colleagues at OFCOM NI[30] who have extensive experience in resolving similar cases.

[27] See: www.icnirp.org

[28] See ComReg Document 08/51R4 – Programme of Measurement of Non-Ionising Radiation Emissions: Methodology for the Conduct of Surveys to Measure Non-Ionising Electromagnetic Radiation from transmitters.

[29] See https://www.comreg.ie/industry/radio-spectrum/site-viewer/non-ionising-radiation-information/

[30] See www.ofcom.org.uk/about-ofcom/how-ofcom-is-run/nations-and-regions/northern-ireland

Annex: 1 Legal Framework Relevant to Spectrum Intelligence & Investigations (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")[31] 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.[32] ComReg functions under the 2002 Act that are particularly relevant to this report include the following:

> *(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.*

ComReg's relevant objectives in exercising those 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

[31] https://www.lawreform.ie/_fileupload/RevisedActs/WithAnnotations/HTML/EN_ACT_2002_0020.htm

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

in respect of the following legislation:

- European Union (Radio Equipment) Regulations 2017[33] ("RE Regulations")
- European Communities (Electromagnetic Compatibility) Regulations 2016 and European Communities (Electromagnetic Compatibility) Regulations 2017[34] (together the "EMC Regulations"

ComReg is the authority charged with the authorisation of wireless telegraphy equipment in Ireland for the purposes of the Wireless Telegraphy Act 1926, as amended ("1926 Act").

Wireless Telegraphy Act 1926, as amended

The 1926 Act requires a person 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.[35] A wireless telegraphy licence is also the legal instrument for assigning right of use for radio frequencies to authorised undertakings who apply for the same, in accordance with applicable provisions of the Framework Regulations 2011 and Authorisation Regulations 2011.[36] Amongst other things, a licence sets out the specific radio frequencies that the licensee 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.

ComReg has the power to declare, by order, a class or description of apparatus for wireless telegraphy to be exempt from the requirement to hold a licence.

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 necessary by force, with a warrant granted by a Judge of the District Court.

European Union (Radio Equipment) Regulations 2017

The RE Regulations define "radio equipment"[37] 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;*

[33] S.I. 248/2017, transposing Directive 2014/53/EU
[34] S.I. 145/2016 and S.I. 69/2017, both transposing Directive 2014/30/EU
[35] Subject to the required consent of the Minister under section 37 of the 2002 Act.
[36] European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. 335/2011) transposing Directive 2002/20/EC
European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. 333/2011) transposing Directive 2002/21/EC
[37] Defined therein as *"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."*

(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 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. Before placing radio equipment on the market, the manufacturer of the equipment shall, for example, draw up the EU declaration of conformity and affix the CE marking.[38] Importers and distributors, in turn, must ensure that such equipment complies with the relevant standards set out under the RE Regulations.

Regulation 30 of the RE Regulations designates ComReg as the market surveillance authority in the State for the purposes of market surveillance, compliance and enforcement under the RE Regulations and RE Directive.

Regulation 31 provides that where ComReg, as the market surveillance authority, has sufficient reason to believe 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 of the RE Regulations. The economic operator (i.e. manufacturer, importer, or distributor) concerned must co-operate with any such evaluation. Where ComReg finds that radio equipment does not comply in all respects, 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. Where ComReg is of the opinion that urgent action is required because of public health or safety requirements it may issue an urgent direction without advance notice.

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 shall also 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

[38] "CE marking" under the Regulations means 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 "EU declaration of conformity" under the Regulations means a declaration of conformity drawn up in accordance with the requirements of Regulation 17.

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 any place where there are reasonable grounds to believe that radio equipment is being kept or which has, for example, been manufactured, stored, distributed, supplied, or placed 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.

European Communities (Electromagnetic Compatibility) Regulations 2016 and 2017

Under the EMC Regulations a person shall not *inter alia* make available on the market equipment to which these Regulations apply, or put into service equipment to which these Regulations apply, unless that equipment complies with these Regulations when it is properly installed, maintained and used for its intended purpose.

Such equipment must also, for example, meet the essential requirements as set out in Annex I to the EMC Directive. ComReg is the designated competent authority and market surveillance authority in the State for the purposes of market surveillance, compliance and enforcement under the EMC Regulations.

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, 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. . Where ComReg is of the opinion that urgent action is required it may issue an urgent direction without advance notice.

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 the search and entry powers very similar to those under the RE Regulations. Appointed Authorised Officers, with or without a District Court warrant as relevant and 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.

Annex: 2 Revised RFI Complaint Classification Process

A 2.1 Type A (Response Time is immediate)

This case would generally be exceptional in nature. Typically, such cases would have a severe impact on an operator's ability to continue to provide a radio communications service and may result in a complete loss of service to users. Cases falling into this category would need to fit the following general description:

- Depending on the Radio communications service being provided there would need to be multiple stations experiencing interference simultaneously;
- The licensee would have no alternative back up channel to switch its service to; and
- Large numbers of users would need to be experiencing loss of service.

Examples of Type A cases could include:

- Instances where multiple TV and radio broadcasting transmitters are experiencing harmful interference such that it is not possible to provide any service to many users;
- Harmful interference to several base stations on a mobile network such that significant number of users are unable to user their mobile phones; and
- Aeronautical or emergency services are interfered with to such an extent that it is impossible for any communications service to be provided to the end user. This may result in the grounding or redirection of aircraft in the case of aeronautical interference.

A 2.2 Type B (Response Time is 5 working days)

Cases falling under this category would need to fit the following description:

- Depending on the type of radio communications service being provided there would generally be 1 or 2 stations experiencing interference;
- the licensee would have an alternative back-up channel to switch its service to; and
- a relatively small number of users would be experiencing loss or degradation of service.

Examples of Type B cases could include:

- Instances where a radio link is experiencing harmful interference such that it cannot operate as licensed;
- Harmful interference to a base station on a mobile network such that a single sector of the base station must be turned off; and
- Harmful interference to a base station such that there is a degradation in the quality of service being provided to the end users.

A 2.3 Type C cases:

Cases falling into this category will generally be questions submitted to interference@comreg.ie. ComReg can then respond to and address without recording as a formal complaint.

Examples of Type C cases would include:

- Reports of harmful interference to TV satellite receivers; and
- Reception issues to domestic TV.

A 2.4 Re-defined Response Times

Response times represent the time taken, from receipt of all the required information from the complainant, to ComReg, or its agents, being deployed into the field to investigate the cause of interference.

This response time is on the basis that the complainant makes engineering staff available to assist ComReg or its agent on site. If a complainant cancels or fails to attend a pre-arranged site visit, the period from cancellation or non-attendance, to ComReg or its agent's site visit will not be counted as part of the response time.

A 2.5 New Reporting Protocol

The revised complaint reporting protocol requires complainants to provide more focused and in-depth information to assist ComReg in its triage and prioritisation of complaints.

This protocol makes clear that ComReg is unable to investigate a report of RFI unless it is satisfied that the interference is 'harmful', outside of the complainant's control and that all reasonable steps have been taken by the complainant to minimise the effect.

Once a complainant is satisfied that the interference it is experiencing is, in its view, harmful, outside of its control and that the affected apparatus is functioning correctly, then a complaint can be submitted to interference@comreg.ie accompanied by the supporting information.

This new reporting protocol enables ComReg to respond to complaints of RFI in a more effective manner leading to an overall more efficient process for all stakeholders.

A 2.6 New close out process

Once an interference complaint has been resolved by ComReg or its agent(s), the following steps will be taken:

- Contact will be made with the complainant outlining a summary of on-site findings including the source of the interference, this may include screenshots showing the absence of interference on the channel concerned. In cases where a prosecution may be likely to be taken the details of interference will not be disclosed;
- An outline of any actions that must be taken by complainant in order to remedy the situation will be given in an email; and
- An acknowledgement that the case has been closed will be sent to the complainant with the corresponding case number.

A 2.7 The flowchart in Figure A2.1 below illustrates the new interference complaint handing process.

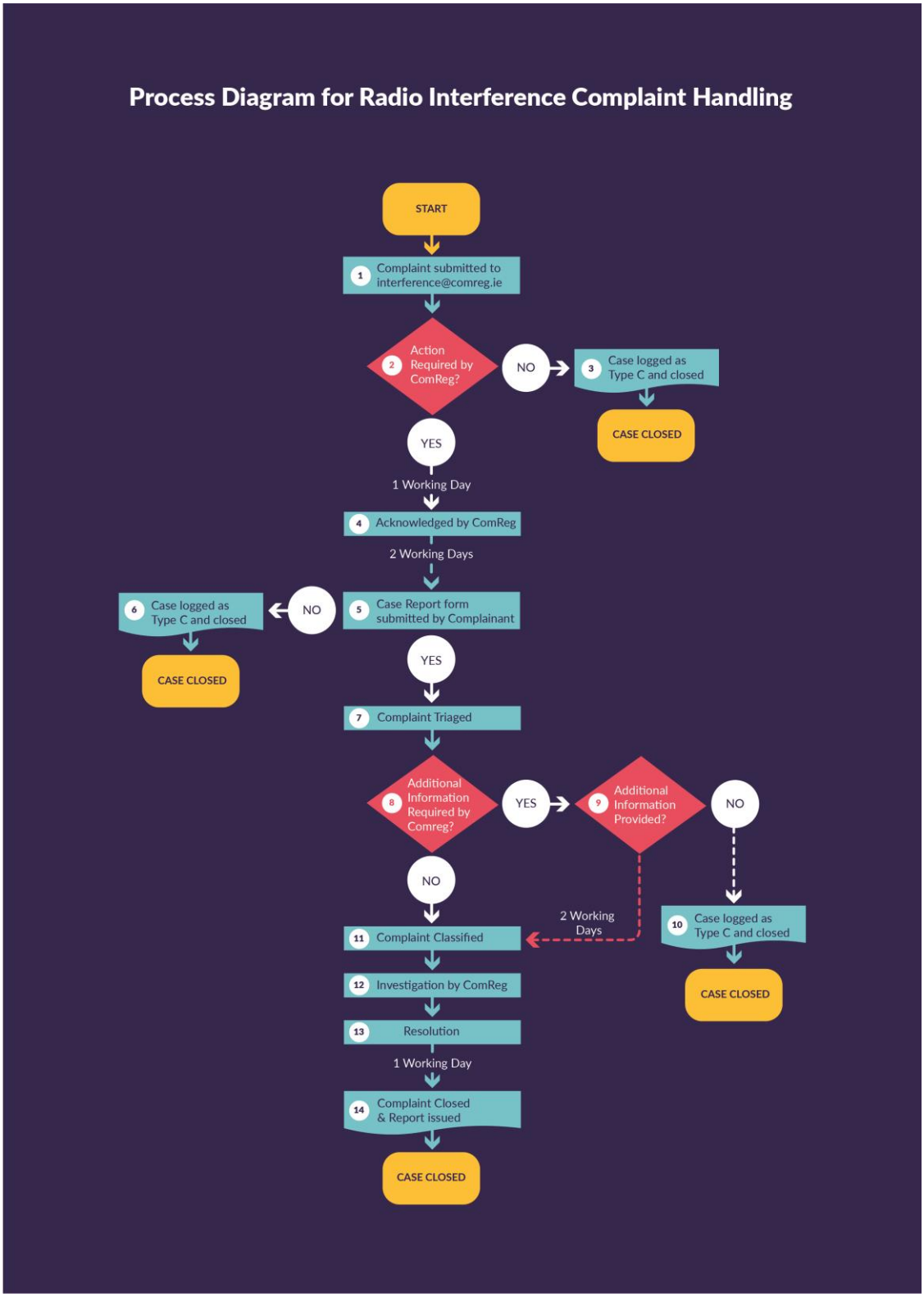

Figure A2.1. Process diagram for RFI complaint handling.