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INDUSTRY GUIDELINE
G545:2026

HFC Network RF Signal Egress Monitoring

G545:2026 HFC NETWORK RF SIGNAL EGRESS MONITORING

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INTRODUCTORY STATEMENT

The **HFC Network RF Signal Egress Monitoring** Guideline (G545:2026) replaces the **HFC Network RF Signal Egress Monitoring** Industry Guideline (G545:2020).

The purpose of the changes are to update the document to better align with current industry processes.

The Guideline defines parameters and methodologies for frequency co-ordination between different broadband reticulation systems running in close physical proximity.

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Chair

HFC Network Revision Working Committee

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PUBLICATION HISTORY

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1. GENERAL

1.1 INTRODUCTION

1.1.1 Section 112 of the Telecommunications Act 1997 (the Act) sets out the intention of the Commonwealth Parliament that bodies and associations representing sections of the telecommunications industry develop industry codes relating to the telecommunications activities of participants in those sections of the industry.

1.1.2 The development of the Guideline has been facilitated by the Australian Telecommunications Alliance through a Working Committee comprised of representatives from the telecommunications industry.

1.1.3 The Guideline should be read in the context of other relevant codes, guidelines and documents.

1.1.4 The Guideline should be read in conjunction with related legislation, including the Act.

1.1.5 If there is a conflict between the requirements of the Guideline and any requirements imposed on a Carrier by statute, the Carrier will not be in breach of the Guideline by complying with the requirements of the statute.

1.1.6 Compliance with this Guideline does not guarantee compliance with any legislation. The Guideline is not a substitute for legal advice.

1.1.7 Statements in boxed text are a guide to interpretation only.

1.2 SCOPE

1.2.1 The Guideline provides guidance to Carriers for monitoring and measuring RF signal egress from Coaxial Cable Distribution Networks.

1.3 OBJECTIVES

1.3.1 This Industry Guideline considers:

a. the maximum permissible levels of egress;

b. techniques for identification of network signals;

c. monitoring guidelines;

d. equipment calibration;

e. fault rectification; and

f. training.

1.3.2 Where applicable, cross-reference to relevant benchmarks and industry guidelines is made to give more specific guidance. These are appended to this Guideline but will be maintained separate to the Guideline.

1.4 GUIDELINE REVIEW

1.4.1 The Guideline will be reviewed every 5 years, or earlier in the event of significant developments that affect the Guideline.

2. ACRONYMS, DEFINITIONS AND INTERPRETATIONS

2.1 ACRONYMS

2.1.1 For the purposes of the Guideline:

ACMA – Australian Communications and Media Authority.

AS – Australian Standard.

CSP – Carriage Service Provider.

CW – Continuous Wave.

EMC – Electro Magnetic Compatibility.

OUDP – OFDMA Upstream Data Profile.

RF – Radio Frequency.

2.2 DEFINITIONS

2.2.1 For the purposes of the Guideline:

Act - means the Telecommunications Act 1997 (Cth).

AS – means a current Australian Standard, as published and amended by Standards Australia.

Asset – means any part or parts of a network, system or facility belonging to a Utility.

Carriage Service Provider – has the meaning given by section 87 of the Act.

Carrier – has the meaning given by section 7 of the Act.

Communication Cable – means Communication Line and Customer Lead.

Communication Line – means a coaxial cable, including any Strand Wire and other types of strength bearer, joint closures, supports and fittings owned by the Carrier which accommodates communication services, but excluding Customer Lead.

Communication Network – means a Carrier's external cable network system which includes, but not limited to, Communication Lines, Customer Leads, Electrical Equipment, pits and pipe, switching, used for the provision of communication services and other services, but excludes Supporting Structures.

Customer Lead – means an underground or aerial lead connecting a Communication Line to the customer's Premises. The lead may provide a telephony service or broadband service, or both.

Employee – means a person in the employment of an Employer (whether under a contract of employment or apprenticeship) and includes a contractor, and a person employed by a contractor, who carries out work for an Employer.

Employer – means a Carrier or the owner or lessee of a Communication Network on which work to which the Guideline applies is carried out.

Premises – means any house, building or structure including the land associated with it.

Strand Wire – means a separately constructed metallic, non-insulated suspension wire to which Communication Network cable and equipment is or may be subsequently attached.

Supporting Structure – means a structure such as, but not limited to, a pole, building or customer Premises which will enable the attachment and support of Communication Network assets, but which may not necessarily belong to the Carrier attaching to it.

Tag – means a unique (low) frequency that is assigned to a particular network and unambiguously identifies that network. The hardware used for the detection of egress will usually be specifically tuned to a particular tag to identify any egress. The tag frequency is modulated over an existing carrier in such a manner so as not to interfere with the actual program content on that carrier.

Utility – means a registered company, person or other body providing a communication, electricity, gas, water, drainage, public transport, or any combination of such, service to the general public.

2.3 INTERPRETATIONS

2.3.1 In the Guideline, unless the contrary appears:

a. headings are for convenience only and do not affect interpretation;

b. a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;

c. words in the singular includes the plural and vice versa;

d. words importing persons include a body whether corporate, politic or otherwise;

e. where a word or phrase is defined, its other grammatical forms have a corresponding meaning;

f. mentioning anything after include, includes or including does not limit what else might be included;

g. words and expressions which are not defined have the meanings given to them in the Act; and

h. a reference to a person includes a reference to the person's executors, administrators, successors, agents, assignees and novatees.

3. GUIDELINE RULES

3.1 GENERAL

3.1.1 It is necessary to limit the potential for signal egress from coaxial cable distribution networks to interfere with other services that utilise the radio frequency spectrum. These other services include not only the emergency services, safety of life, aeronautical and radio navigation services, but also the broadcasting (e.g. FTA Television, FM Radio) and amateur radio services.

3.1.2 Carriers and Carriage Service Providers need to ensure that they can demonstrate that they have taken Electro Magnetic Compatibility (EMC) issues into consideration and have a process in place to ensure on-going compliance with the spirit and intent of the Australian Communications and Media Authority (ACMA) EMC requirements.

3.1.3 Although Carriers and Carriage Service Providers endeavour to minimise the potential for Radio Frequency (RF) network signal egress through their attention to network design, equipment specification, installation and maintenance practices, there are a number of factors that may contribute overtime and result in an unacceptable level of RF egress from coaxial networks. These factors include—

a. ageing and deterioration of equipment, cable and components due to exposure to adverse environmental and stress conditions.

b. improper installation or disconnection of a service.

c. customer tampering with operator provided customer cabling and customer premises equipment.

d. unauthorised and illegal extensions of customer premises wiring and outlets with inferior and substandard cable and components.

3.1.4 Signal egress is indicative of the physical integrity of the cable plant, and as such, offers a valuable tool in averting the potential for customer dissatisfaction as a result of service interruptions or picture quality deterioration.

3.1.5 Carriers and Carriage Service Providers should measure, monitor and record RF signal egress to—

a. Minimise the potential for interfering with “safety of life” and other services including entertainment that share the radio frequency spectrum.

b. Assist in pro-active maintenance activities to maximise the service life of the network (reduce operational costs) and minimise customer dissatisfaction.

c. Manage Public Perception - provide hard irrefutable data that they are responsible public RF (egress) managers.

3.1.6 A Communication Network should be designed and constructed in such a way as to take all reasonable steps to ensure that it is suitable for the environment in which it will operate. The Communication Network must be maintained in such a way as minimise the occurrence of excessive RF egress.

3.2 RF ACTION LIMITS

3.2.1 A Communication Network must be maintained to limit RF egress to less than 20 µV/m, when measured in accordance with section 4.2.

3.2.2 Instances of RF egress should be repaired with the priorities in Table 1.

TABLE 1
Repair priorities for RF Egress

Priority	RF Egress
High	≥ 20 µV/m
Medium	10 to 19 µV/m
Low	<10 µV/m

3.3 MEASUREMENT FREQUENCIES

3.3.1 At least one unique carrier frequency should be used by each Carrier to reliably monitor RF signal egress. The carrier frequency must be tagged to allow discrimination by the receiver.

3.3.2 The carrier frequencies currently in use by Carriers and Carriage Service Providers at the time of preparation of this Guideline are shown in Appendix A to avoid their use by other Carriers and Carriage Service Providers.

3.3.3 New Cable TV Operators must negotiate with existing Carriers and Carriage Service Providers to determine an acceptable unique carrier frequency and Tag combination which allow discrimination of the source of RF egress between networks.

3.3.4 Regardless of the receiver technology a Carrier chooses, the onus is on the Carrier to implement a system which ensures that RF signal egress from its network is accurately measured, and any egress above the prescribed limits are corrected.

NOTES:
1. CT-3 tones are AM tagged, CT-4 tones are Continuous Wave (CW) carriers (not AM or FM tags) with the 'tag' provided by the adjustable frequency offset of the two tones centred around each leakage detection frequency.
2. OFDMA upstream data profile (OUDP) burst signals for leakage detection have no tagging parameter and must be distinguished between Carriers via frequency or other controls.

4. GUIDELINE COMPLIANCE PROCESS

4.1 GENERAL

4.1.1 Communication Cables, including any Supporting Structures, fittings and accessories should be maintained in a safe operating condition, including avoiding contact with Electrical Apparatus. The integrity of Insulated Communication Cables should be maintained.

4.1.2 The Communications Network owner must have in place a maintenance program that includes testing for RF egress and repair of Communications Cables where such egress is detected according to the priorities noted in Section 6.2.

4.1.3 A system of maintenance for Communication Networks Assets, including any Supporting Structures belonging to the Communication Network owner, should consist of—

a. inspection and/or testing programs;

b. maintenance programs; and

c. replacement programs for components approaching the end of their serviceable life.

4.1.4 Where appropriate a system of maintenance should consist of the following elements—

a. a record of network Assets and their respective locations;

b. a schedule of maintenance activities; and

c. a record of maintenance work carried out.

4.2 TESTING ARRANGEMENTS

4.2.1 Methods of measurement may depend on—

a. the type of construction - Aerial or Underground

b. SDU, MDUs and

c. network plant

4.2.2 Refer to table 1 in Section 3.2 for recommended equipment thresholds when set up to display the signal strength at 3m from RF egress.

4.2.3 All prioritisation of jobs to fix the faults should be based on the recorded egress level.

4.2.4 Carrier staff conducting measurements should—

a. use an accurate, calibrated signal-egress measuring instrument with a dipole antenna to measure signal egress. The instrument must be able to detect and measure a 20 µV/m egress at 3 metres;

b. measure any egress at 3 metres, if possible (If not, measure as close to the egress as possible and note the estimated distance to the expected source);

c. rotate the dipole about the vertical axis to obtain the highest possible reading (i.e., peak out the signal); and

d. maintain an accurate log of all egress found that exceeds 20 µV/m at 3 metres.

4.3 HAZARD ASSESSMENT

4.3.1 An appropriate egress assessment should be completed after any work undertaken, in accordance with Carrier approved procedures.

4.3.2 The hazard assessment must be regularly audited by the Carrier to ensure compliance.

4.4 RISK CONTROL AND EMERGENCY PROCEDURES

4.4.1 Appropriate risk control measures and emergency procedures must be adopted for any identified hazard in accordance with Carrier approved procedures.

4.4.2 If a hazard is identified at the work site a hazard assessment should be undertaken prior to commencing work.

4.5 MONITORING EQUIPMENT

4.5.1 The Employer must ensure that the RF egress monitoring equipment used can accurately determine the level of egress.

4.5.2 All RF egress monitoring equipment must be periodically inspected and calibrated to ensure its accuracy.

4.5.3 The Employee must use the appropriate RF egress monitoring equipment provided by the Employer.

4.5.4 Any defective RF egress monitoring equipment must be withdrawn from service.

4.5.5 The Employee must not use any suspected defective RF egress monitoring equipment.

5. TRAINING

5.1 GENERAL

5.1.1 This section applies to Employee training for any work activities on Communication Networks, for which the “Scope” of this Guideline applies.

5.2 QUALIFICATIONS AND TRAINING

5.2.1 No work to which this Guideline applies must be carried out unless the Employee has received training which is appropriate for the work concerned has received appropriate practical and theoretical instruction so that the procedures are thoroughly understood.

5.2.2 The Employer must determine that appropriate training courses have been undertaken for the respective Employees to ensure that they can carry out the required tasks competently. The following should be considered—

a. accreditation of the courses;

b. accreditation of the trainer;

c. the relevance to the tasks to be performed;

d. national competency benchmarks or industry equivalent;

e. the course syllabi;

f. the facilities for training;

g. assessment criteria for the issue of certificates; and

h. whether the training provider has a Quality Assurance system in place

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6. REFERENCES

Legislation
Telecommunications Act 1997 *https://www.legislation.gov.au/C2004A05145/latest/text*

APPENDIX

A RF MEASUREMENT FREQUENCIES

Refer to Table 2 for a list of tagged carrier frequencies in use at the time of publication of this Guideline.

TABLE 2
Carrier Frequencies for RF Egress Monitoring

Carrier	Frequency in MHz	Tag
NBN Co	124.2375	AM – 20 Hz tag
NBN Co	136	Dual CW – 625 Hz tag
NBN Co	138.425	OUDP
NBN Co	614	Dual CW – 625 Hz tag
Vision Networks (Vocus) – Low	NTSC 16 - 132.005, 138.005	Arcom code 1
Vision Networks (Vocus) – Medium	NTSC 62 - 450.005, 456.005	Arcom code 1
Vision Networks (Vocus) – High	None (monitoring OFDM pilot frequencies only)	

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