
ND1403:2005/07

Guidelines

for any External Network Interference issues

to Radio Users due to

Radiated Emissions from Fixed Public Networks.

Issue 2

Network Interoperability Consultative Committee
Ofcom
Riverside House,
2a Southwark Bridge Road,
London SE1 9HA
UK
<http://www.nicc.org.uk>

Normative Information

© 2005 Ofcom copyright

NOTICE OF COPYRIGHT AND LIABILITY

Copyright

All right, title and interest in this document are owned by Ofcom and/or the contributors to the document unless otherwise indicated (where copyright be owned or shared with a third party). Such title and interest is protected by United Kingdom copyright laws and international treaty provisions.

The contents of the document are believed to be accurate at the time of publishing, but no representation or warranty is given as to their accuracy, completeness or correctness. You may freely download, copy, store or distribute this document provided it is not modified in any way and it includes this copyright and liability statement.

You may not modify the contents of this document. You may produce a derived copyright work based on this document provided that you clearly indicate that it was created by yourself and that it was derived from this document and provided further that you ensure that any risk of confusion with this document is avoided.

Liability

Whilst every care has been taken in the preparation and publication of this document, NICC, nor any committee acting on behalf of NICC, nor any member of any of those committees, nor the companies they represent, nor any person contributing to the contents of this document (together the "Generators") accepts liability for any loss, which may arise from reliance on the information contained in this document or any errors or omissions, typographical or otherwise in the contents.

Nothing in this document constitutes advice. Nor does the transmission, downloading or sending of this document create any contractual relationship. In particular no licence is granted under any intellectual property right (including trade and service mark rights) save for the above licence to copy, store and distribute this document and to produce derived copyright works.

The liability and responsibility for implementations based on this document rests with the implementer, and not with any of the Generators. If you implement any of the contents of this document, you agree to indemnify and hold harmless the Generators in any jurisdiction against any claims and legal proceedings alleging that the use of the contents by you or on your behalf infringes any legal right of any of the Generators or any third party.

None of the Generators accepts any liability whatsoever for any direct, indirect or consequential loss or damage arising in any way from any use of or reliance on the contents of this document for any purpose.

If you have any comments concerning the accuracy of the contents of this document, please write to:

The Technical Secretary, Network Interoperability Consultative Committee,
Ofcom,
2a Southwark Bridge Road,
London SE1 9HA.

CONTENTS

NOTICE OF COPYRIGHT AND LIABILITY	2
1. Scope	3
2. Terminology	4
3. Actions undertaken prior to receipt of complaint	4
4. Mitigation Actions	5
5. Timescales	6
6. History	6
Annex A	7

1. Scope

These Guidelines apply to fixed public network operators deploying xDSL systems over metallic pair telecommunication networks. (note 1). The guidelines identify the steps that telecommunications operators will be expected to take to mitigate any interference to radio users (note 2) that is being caused by the operation of their applicable system, in the event that an interference complaint is received (notes 3 and 4).

- Note 1. Formally, the requirements in these guidelines only apply in situations where an interference complaint is received directly by Ofcom and where Ofcom considers that the complaint is valid and reasonable. However, the guidelines on mitigation actions may also be used to manage any external interference complaint where the source of the interference is suspected to be due to the telecommunication operator's equipment e.g. a complaint made directly to the network operator.
- Note 2. In general the electromagnetic environment is managed by EMC standards, agreed on an international basis, with the intention of giving reasonable protection without unduly hampering industry. Interference can occur either because an equipment or system is not compliant (excessive radiation and/or inadequate EMC immunity) or because the existing EMC regulations give inadequate protection in some specific instance. The investigation and management of incidences of radio interference is in the province of national administrations. In the UK Ofcom carries out this function.
- Note 3. The mitigation actions listed in these guidelines are not mandatory but in the event of a formal complaint received and accepted by Ofcom, if the network operator fails to mitigate the interference being caused by the unintended signals radiating from their applicable system, Ofcom will require evidence that reasonable steps have been taken. Compliance with the checks in this document would normally be regarded as 'reasonable steps'.
- Note 4. Separate guidelines have been produced covering inter-network interference (i.e. cross-talk interference within the access network).

For illustrative purposes only, Annex A provides an overview of the external interference complaint process, particularly as it relates to the actions to be taken by public network operators. The Annex shows where these guidelines fit into the overall process.

2. Terminology

Cable User	A DSL operator making use of the local loop infrastructure for delivering its services. (This includes both an operator providing service over another operator's local loop and the operator providing service over its own local loop.)
Cable Manager	The Local Loop Provider responsible for the provision and maintenance of the local loop infrastructure and investigation of ANFP non-compliance complaints. (For the BT access network the Cable Manager is BT; For the Kingston Communications access network the Cable Manager is Kingston Communications.)
CPE	Customer Premises Equipment
End-user	The end customer being served by the Cable User via a local loop.
Network Operator	An operator of a fixed public telecommunications network.
Ofcom	Office of Communications
PLT	Power Line Transmission
PNO	Public Network Operator
WT	Wireless Telegraphy

3. Actions undertaken prior to receipt of complaint

Before a network operator¹ receives a formal investigation request from Ofcom regarding external interference, the following actions are expected to have taken place:

- it will have been confirmed by Ofcom that the interference complaint is in relation to an authorised wireless telegraphy service;
- the radiated signals causing the interference will have been located by Ofcom to the applicable system of the network operator;
- the complainant will be expected to have taken all reasonably practical steps to alleviate the interference problem before it is escalated as an official interference complaint². These steps may include (but are not limited to) the following:
 - (a) increasing the separation distance between the affected system and the system causing the interference, where this is possible;
 - (b) altering the relative orientations of the affected system and the system causing the interference; and
 - (c) ensuring that other sources of interference are not significantly contributing to the interference problem.

When a telecommunications network operator receives a formal external interference investigation request, the complaint will be submitted by Ofcom to the relevant network operator and it is expected to be accompanied by the following information (subject to any overriding data protection requirements):

- name and address of complainant;

¹ The source of the interfering signal that is responsible for the interference complaint will be tracked by Ofcom to the network operator's wires radiating the signal. Hence it will be the Cable Manager function of the network operator that will need to handle the complaint in the first instance.

² The actions listed here will have been undertaken by the complainant (or jointly by the complainant and Ofcom) as part of the initial Ofcom investigation.

- location (post code, house number) where interference is being experienced (if not the same as the address of the complainant);
- location of telecommunications system from which the interference signal radiates (including an outline of the evidence that the interference does indeed come from that telecommunications system);
- details of the equipment being interfered with and the effects being experienced (e.g. broadband or narrowband, constant or intermittent, level of interference, when the interference was first noticed);
- the results of the actions taken by the complainant to try and alleviate the interference.
- contact details of the Ofcom investigating officer.

4. Mitigation Actions

It is expected that a telecommunications network operator within the UK will behave in an open and professional manner in the execution of their systems.

There is no simple definition of 'Interference' therefore it is expected that any investigation will be initiated on the basis of a complaint from the radio user affected.

Potential sources of unintended radiation from telecommunication systems include (but are not limited to) the operation of DSL systems (particularly those providing higher bandwidths e.g. ADSL and VDSL) and PLT systems. In addition, signals from switched mode power sources associated with access network equipment or CPE (e.g. home networking equipment) may be a potential source of a radio interference signal. However, if the equipment is not owned by or within the responsibility of the network operator, the network operator may not be able to resolve the interference complaint.³.

The following actions represent reasonable steps that may be undertaken by a Cable Manager to mitigate any interference being caused. The actions listed are not exhaustive and are not presented in any particular order.

Actions

1. Check what access network technologies are deployed in the vicinity of the location of the interference complaint. If there are no technologies deployed that are consistent with the nature of the interference being experienced, then consideration needs to be given to whether the interference could be due to CPE or a systems deployed by a Cable User. In this case, the complaint will need to be investigated in co-operation with the Cable User and/or customer.
2. If it is suspected that the interference may be due to a wiring problem, one or more of the following actions may be taken:

³ The network operator responsible for managing and operating the metallic path from which the interference signal radiates is responsible for managing the interference complaint. It may be that the interference signal originates from equipment connected to that metallic path but not owned by the network operator (e.g. from CPE) or from equipment not directly connected to the metallic path. In such cases, it is still the responsibility of the metallic path network operator to manage the interference complaint but in co-operation with the person responsible for the equipment originating the interfering signal. If co-operation is not forthcoming, the metallic path network operator may have the authority (depending on specific circumstances) to disconnect the metallic path from the offending equipment.

- a) Check that the suspected source of the interference signal is due to the network operator's (i.e. cable manager's) applicable system e.g. by measuring the signals radiating from the relevant wire.
Note: one mechanism to locate the source of the interference signal is to check if the interference goes away when the suspect equipment is switched off. However, this needs the co-operation of the equipment owner and user.
 - b) Check the line that has been identified as radiating the unwanted interference signal for faults and take corrective action accordingly.
 - c) Check customer's installation, wiring configuration and connection to the network and advise customer of any recommended actions for them to take.
 - d) Consider whether any reasonable changes can be made to the network configuration e.g. the physical routing of the drop wire.
3. If it is suspected that the interference may be due to signals caused by Cable User's or End-User's equipment (i.e. CPE), then the co-operation of the Cable User and/or End User will be required. This includes:
- a) Check for the correct operation of exchange end equipment (e.g. DSLAM) and customer end equipment (e.g. far end modem/CPE) to verify equipment performance and specification compliance. Such a check may include, but is not limited to, the use of diagnostic functions in the equipment, independent testing against exchange and CPE using compatible field-deployable "golden modem" DSL test equipment, and substitution of suspect equipment with a "known good" element which meets all applicable deployment parameters.
 - b) Fit (or send out for self-install) a mitigation component (e.g. a suitable common mode choke and/or line stabilisation networks/devices).
 - c) If appropriate/possible, reduce the power level of the modem, either within specific frequency bands or across the entire frequency range.

5. Timescales

Resolution of interference problems can be very complex and can take significant time, particularly when co-operation with other network operators and/or end-users is required. Whilst actions such as 1 and 2b can usually be done remotely and hence can be expected to be completed within 2 working days of the receipt of the complaint, the other actions are likely to require a site visit and possibly co-ordination with other network operators and/or end-user. Such actions may require a number of weeks to complete. Whilst no timescales are set for these actions, network operators are expected to manage interference complaints in a professional and speedy manner.

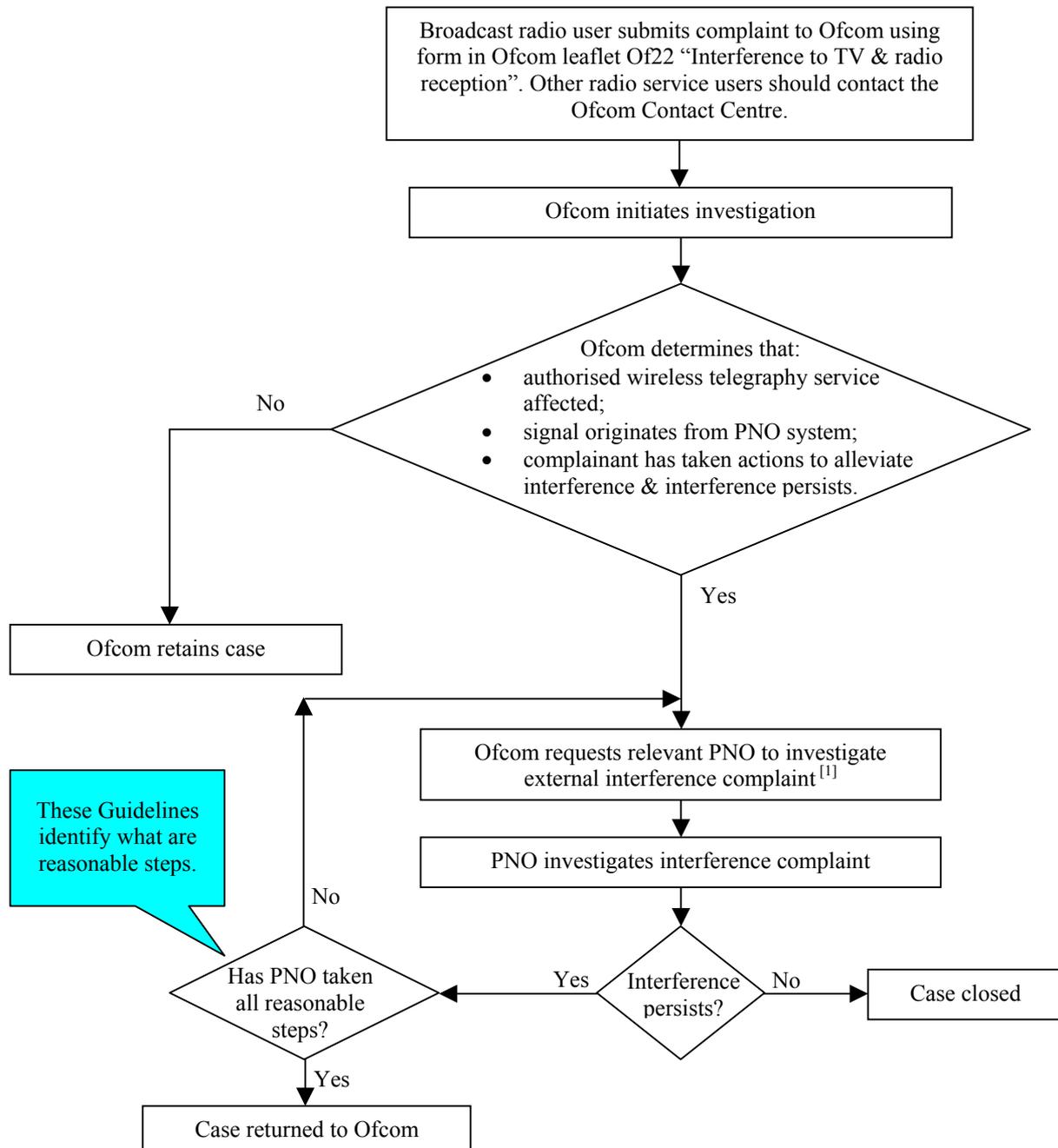
6. History

Issue 1	March 2002	Approved by DSL Task Group on 6/3/02
Issue 2	July 2005	Revised to take account change of regulations (removal of licence conditions) and organisational changes.

Annex A

External Interference Complaint Process

This Annex is for information only and does not form part of the Guidelines. It gives an overview of the external interference complaint process as it relates to PNOs and identifies where these Guidelines fit in this process.



Note 1: The requirement on PNO to investigate and take action to resolve interference complaint is independent of the level of the interference signal.

- End -