

This document outlines the interference resolution procedures that NESMC and its members will follow when faced with interference. This document is primarily concerned harmful interference between systems operating within the NESMC territory.

## **Definitions**

The Federal Communications Commission (FCC) defines harmful interference as interference that endangers the functioning of a radionavigation service or other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations.<sup>1</sup>

Hearing a distant co-channel repeater when your local repeater is not active is not harmful interference. Hearing adjacent channel splatter while carrying on a conversation on simplex or your local repeater, while affecting the quality of the conversation, is not truly interference unless it makes communication completely impossible.

There are basically two types of interference, unintentional and willful. Unintentional interference is usually operator error, such as keying on the wrong frequency, or equipment malfunction, such as a transmitter that develops spurious emissions. Unintentional Interference is easily rectified once the source of the interference is identified, if it persists at all. Unintentional interference is rarely harmful; but when it is, the procedures outlined here can be used to correct the situation.

Willful or malicious interference is that which often comes from either *a priori* determined mischievous operation, or unintentional interference that is not rectified once the source of the problem is identified. Examples could be intentionally tying up a repeater or frequency to prevent its use by other persons or operating a station after it is discovered that it interferes with a coordinated repeater. An interfering system operating outside of NESMC's Technical Standards is always considered to be causing willful interference. Also, a new system that causes interference to a previously coordinated system and does not immediately take action to alleviate the interference is willfully interfering with the other system.

NESMC defines a “system” as a station under Automatic control, including but not limited to Auxiliary stations, Repeater stations, Message Forwarding Systems, Automatically controlled digital stations, or other stations that require the use of a dedicated frequency or frequencies. A coordinated system is one that meets all of the NESMC coordination criteria and is recorded as coordinated in the coordinator's database. In order to be coordinated, a system must follow the coordination procedure, including Application for the coordination, and have received a Certificate acknowledging the entry of the system into the coordination database. Additionally, all systems must adhere to NESMC Technical Standards and a system may void its coordination if in violation of either these Standards or FCC Rules and Regulations.

## **General Principles**

Generally, a great deal of issues are resolved or avoided by following simple guidelines. Fortunately, such guidelines can also be made when it comes to resolving interference. The first step is prevention, which includes operating within NESMC's Technical Standards and following generally accepted rules of courteous operation and good amateur practice. Simply put, any station operating outside of NESMC's Technical Standards is solely responsible for any and all interference it causes. An uncoordinated station that interferes with a coordinated station has sole responsibility to resolve the problem. A coordinated station that changes any part of the system installation, such as antenna height, location, or ERP, which results in interference to another coordinated station is

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<sup>1</sup> FCC Rules and Regulations, Part 97.3(22)

likewise solely responsible to rectify the problem. Common sense and good amateur practices are the best ways of preventing and solving interference problems.

A good first step is to try to resolve the problem without involving others. Most interference problems are quickly rectified as soon as the interfering station is informed of the problem. Most amateurs are not interested in creating problems for others and can be quite attentive to issues that arise from their operation. In fact, many hams will be quite thankful to hear about a problem in a kind manner from a fellow ham than via some official proceeding by a body such as NESMC or the Amateur Auxiliary. However, occasionally this is not the case and help is needed from outside the parties involved in the problem.

NESMC has two paths for solving interference problems. The first is via the Section Directors. Section Directors are to be involved anytime a coordinated system is involved in an interference dispute and the situation is not quickly or satisfactorily resolved between the trustees with the help of the coordinator. NESMC Coordinators are not responsible for solving disputes; the coordinator will identify the coordinated system(s), suggest technical solutions, and record all changes. It is the trustees who are responsible to solve the problem, with advice and information from others, if appropriate. If they cannot reach resolution, then the NESMC Director should become involved to see if a more formal process is warranted. A second path for solving interference problems is the NESMC Interference Committee. The Committee exists as a resource for the community, systems owners, and NESMC Directors, to help resolve interference problems. Any system owner, or other user of the spectrum, may consult with the Committee for assistance in resolving interference problems.

There are a few things to note, which are often confusing to those new to NESMC. First, NESMC has no enforcement powers, nor does any individual or group short of the FCC. However, the Amateur Service is required to be self-policing. Since NESMC is an organization that represents the amateur community, taking its role in interference resolution seriously is within the spirit of the requirement and good for the hobby. Another consideration is that a system that has the prior coordination date has advantage in an interference complaint involving other systems. Another basic principle is the use of minimum necessary power as stated in the FCC Rules and Regulations and systems that use excessive power are likely to cause harmful interference to other systems and users of the spectrum. Systems found to be using more power than necessary and causing interference will be quite likely to be deemed solely responsible for solving the interference problem. Co-channel repeaters may have overlapping coverage areas, in which a user may hear more than one repeater from some locations, which becomes more troublesome during band openings. Using a unique CTCSS tone for each co-channel repeater's transmitter can alleviate this situation. Repeaters should expect that many of their users will experience problems of overlapping coverage and plan to deploy both input access tones and output tones for decode on the user's receiver. NESMC will not accept complaints of interference from repeater owners whose machines do not have access protection (*ie.* CTCSS tone access) and are periodically and inadvertently accessed by co-channel users.

## ***Interference Between Users of the Spectrum***

If interference arises as a result of a station's inappropriate use of the spectrum as defined by the NESMC Bandplan, then a NESMC Director should be consulted. An example that should be brought to our attention would be the deployment of a repeater on simplex channels, which is in violation of NESMC's bandplan. Another example in which a NESMC Director could be contacted would be if interference to space operations were caused by adjacent-channel high speed digital operations. Such interference should be reported if persistent. Feel free to contact a NESMC Director or the NESMC Interference Committee when an interference problem may be solved by our involvement.

## ***Interference Between Uncoordinated Systems***

Uncoordinated systems have no protection from each other when interference occurs. The first step in resolving interference should be worked out between the parties themselves. Often, simple technical modifications can be made to one or both installations to resolve the issue. These include: access control (*ie.* tone squelch) on the system inputs, reduction of transmitter power, and modification of antenna patterns. All amateurs should work together to reduce and/or eliminate interference. If resolution to the problem can be found, the NESMC Interference Committee may be consulted for assistance. Of course, coordination is recommended to prevent such problems.

## ***Interference Between Coordinated Systems***

Interference between coordinated systems should not occur unless at least one system has changed something. This change could simply be that a system started operations under a Test Certificate as a new allocation. In any event, the system that changed something is responsible to resolve the problem. NESMC Coordination Procedures require that any system that changes an operating parameter, and does not update the coordinator prior to the change, voids the system's coordination.

However, in some cases permission may be given to make a coordinated system change that ends up interfering with another coordinated system. Of course, a simple solution would be to reverse the change but in some cases this is not possible, such as the loss of a repeater location. Another solution would be to have the two systems cooperate on a solution in which both systems can coexist with the new changes. In any event, the coordinated systems must work with the coordinator to find a solution to the problem. If a solution cannot be found, then one of the parties should contact the NESMC Director in the area to begin investigations.

## ***Interference Between a Coordinated and an Uncoordinated System***

An uncoordinated station that interferes with a coordinated station has sole responsibility to resolve the problem.<sup>2</sup> Uncoordinated systems must accept all interference they receive from coordinated system. Coordinated systems that receive interference from uncoordinated systems should contact the trustee of the interfering system and inform him of the problem. If the interference continues, the coordinated system trustee should contact his NESMC Director.

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<sup>2</sup> FCC Rules and Regulations, Part 97.201(c) and 97.205(c)  
NESMC-IRP rev. 8/2002

## ***Interference Resolution Process***

The Process by which NESMC shall deal with interference issues is as follows:

### 1 Complaint

The first step in NESMC's involvement is the receipt of a Complaint of interference. The party making the Complaint, or a NESMC Director acting on behalf of the community, shall file a NESMC Interference Report Form. Complaints are to be filed with either a NESMC Section Director or, if the Director is involved or unavailable, any other NESMC Officer. The NESMC official receiving the Complaint shall make it available to the Board of Directors via the NESMC Vice President. Once a Complaint is received, the Vice President shall give the Complaint an unique problem identifier. The unique problem identifier, the format of which is set by the NESMC Board of Directors, is to be used on all correspondence so that documents can be tracked and easily identified. For instance, this unique problem identifier ideally appears in the upper right corner of all hardcopies and in the subject line of all email. The NESMC Vice President shall have the responsibility to track and report to the Board of Directors regarding the status of Complaints.

### 2 Investigation

2.1 When a complaint is received, and the interfering system is under a Test Certificate, the Director shall remind the interfering station of its obligation under the terms of the Certificate to cease operations when interference is reported.

2.2 If the Complaint involves systems, the NESMC Section Director shall inform the Coordinator of the band in which the complaint of interference originated. The coordinator shall respond with any information he has about the station(s) in question along with their coordination status. The coordinator shall then take any other action required by the NESMC Coordination Procedure in response to a Complaint. All coordination activity for either party is suspended (i.e. no changes in operation parameters are permitted) until the Complaint is resolved.

2.3 Copies of the Complaints shall be sent to the Coordinator for recording if not already recorded.

2.4 The Director shall contact adjacent Section Directors to determine if adjacent sections have complaints about the same problem. If the Complaints span multiple sections, the Directors involved shall determine which Director shall handle the problem.

2.5 The Director shall then contact all involved parties and discuss plans for the resolution of the problem. If a solution is found, the Director shall keep track of a schedule for the resolution and track the progress of the solution. If a solution is not offered, or if the plan for resolution is not followed, the Director shall continue with the investigation. If the problem is resolved at this point, the party issuing the Complaint shall inform the Director in writing of the resolution; the Director shall then inform the Coordinator that the Complaint is resolved and send a copy of the letter indicating the resolution to the Coordinator.

2.6 Under the investigation, the Director shall collect the following information:

2.6.1 Call Signs of all systems involved

2.6.2 Coordination status of all stations

2.6.3 System operational parameters including power, ERP, HAAT, antenna configurations, access methods, and time on-the-air.

2.6.4 Audio recordings, where possible

2.6.5 Spectral measurements, where appropriate

2.6.6 Signal strength measurements to determine contour

2.6.7 A log of when the interference occurred, what was said, who said it (if known), and what the circumstances were.

2.6.8 The exact location of all stations and service areas

2.6.9 Any other information the Director shall deem appropriate, or as he shall be directed by the Coordinator or the Board of Directors.

2.7 Where a complaint involving interference of unknown origin is filed, the Director shall attempt to identify the source of the interference through local monitoring and other means, such as Radio Direction Finding. If all attempts to identify the source of the interference are unsuccessful, the Director shall seek assistance from the NESMC Interference Committee.

### 3 Report of Findings

3.1 The Director shall determine, based on his collected information, whether a particular station is responsible to resolve the problem.

3.2 The Director shall prepare a report that shall include all of his findings, recommendations, and conclusions. A copy of this report shall be sent to the Board of Directors, the Chairman of the Interference Committee, and each of the systems involved in the dispute.

3.3 The Report shall include the previously assigned unique problem identifier for tracking purposes.

3.4 Supplementing the Report, the Director shall have available all supporting documentation, including Applications, Certificates, recordings, and correspondence, for inspection by NESMC officials.

3.5 The Director's findings shall identify the problem as an Educational Problem, a Technical Problem, and/or an Malicious Problem.

#### 3.5.1 Educational Problems and Resolutions.

3.5.1.1 Where the Director determines that an interference problem is caused by a licensee unwittingly operating in violation of FCC Rules and Regulations, clearly interfering with coordinated operations, operating contrary to established bandplans, or behaving contrary to good amateur practice, the Director shall notify the offending licensee of the interference, its obligations under the FCC's rules and regulations, and advise it of necessary steps to eliminate the interference.

3.5.1.2 Where the Director determines that the offending interference is caused by the operations of an unlicensed or improperly licensed entity, the Director shall notify the offending entity of the interference and its obligations under the FCC's rules and contact the NESMC President to seek assistance from the FCC.

3.5.1.3 Where the Director determines that harmful interference does not exist, he shall inform the party making the Complaint that he does not find grounds for the Complaint citing appropriate FCC Rules and Regulations, NESMC Technical Standards, or any other appropriate documents. If the party issuing the Complaint is not satisfied, he may file his complaint with the NESMC Interference Committee.

3.5.1.4 Educational Problems should be easily and quickly resolved by educating the interfering party. The Director's Report should be tailored to provide this education.

#### 3.5.2 Technical Problems and Resolutions.

3.5.2.1 Technical problems include such things as excessive contour overlap, intermod, or spurious emissions. Systems failing to meet NESMC's Technical Standards and causing interference, which would not cause interference if the Standard were followed, are considered to have Technical Problems. Likewise, systems that interfere with another system due to excessive power output are considered to have Technical Problems.

3.5.2.2 Upon identification of the interference source, the Director shall notify the offending licensee/operator of the problem and discuss possible technical solutions. These technical solutions may include, but are not limited to: reducing power, lowering antenna height, antenna pattern reconfiguration, or the selection of an alternative frequency.

3.5.2.3 The Director shall consult with the Coordinator regarding technical solutions and only those reviewed by the Coordinator shall appear in the Director's Report.

3.5.2.4 The Director shall orient his Report to emphasize the identified solution(s).

### 3.5.3 Malicious Problems and Resolutions

3.5.3.1 Malicious interference problems are all those that are the result of intentional actions of a user or system and which would be reasonably assumed to cause harmful interference by the average operator.

3.5.3.2 Malicious interference is distinguished from unintentional interference when the party causing the interference refuses to cooperate in resolving the interference after the problem is brought to his attention. Otherwise, there must be clear data to show that the interfering party's intent was to create harmful interference.

3.5.3.3 All cases of apparent malicious interference shall be forwarded to the Amateur Auxiliary so that steps can be taken for enforcement action.

3.5.3.4 The Director should prepare copies of all available records, including coordination Applications, Certificates, history, Investigation records, recordings, prior Reports and resolutions. These records shall be turned over to the Amateur Auxiliary to supplement their investigation.

3.6 If the Section Director determines that harmful interference exists, the Director may promptly notify the station deemed responsible for the interference and request the station to cease transmissions until the solution is adopted and implemented. The Director shall cite all applicable FCC Rules and Regulations in this request. The Report shall also include these citations.

## 4 Investigation Response

4.1 The Director shall produce a Report and a proposed resolution of the Complaint within six (6) months of the initial filing of the Complaint.

4.2 If the Director finds that harmful interference does not exist, he shall inform the party making the Complaint that he does not find grounds for the Complaint citing appropriate FCC Rules and Regulations, NESMC Technical Standards, or any other appropriate documents in his Report. In addition to sending the Report to all parties in the dispute, the Director shall file his Report with the Coordinator and the Interference Committee.

4.3 If, through negotiation with an interfering station, the Director is able to negotiate a plan to resolve the problem, the Director shall provide a written summary of the problem and its resolution to all parties including a schedule of the remedy. The Director shall supervise the implementation of the resolution. Upon a determination that the matter has been satisfactorily resolved, the Director shall file notice with the Coordinator that the matter is closed and send a Report that is to be kept on file by the coordinator to be made available upon request by NESMC officials, the Amateur Auxiliary, or the FCC. Additionally, the Director shall solicit a written verification that the problem has been satisfactorily resolved from the party making the Complaint and submit this verification with his Report. The Coordinator shall file the Report along with all material and documents arising from the Investigation.

4.4 If a plan is not adopted, the interference persists, or if the plan for resolution is adopted but not implemented within the schedule, the Director shall inform the NESMC Board of Directors of the failure to achieve resolution. The Director shall pass all responses to his Report as well as any further developments to the NESMC President.

4.5 The Board of Directors or the President, on advice from the Board of Directors, shall decide whether to:

4.5.1 Refer the problem back to the Director, who shall then amend his report to include the recommendations of the Board. Once the President approves the report, the Director shall then distribute this report to all parties involved in the dispute and begin the Investigation Response process again. The President and the Board may choose to continue this cycle until it is believed that this avenue of resolution is exhausted. Or,

4.5.2 Refer the problem to an interference committee, including NESMC's Interference Committee, and direct the Director to turn all investigation materials and documents over to the Committee;

4.5.3 Attempt to resolve the problem on behalf of the Board of Directors. This may include selection of an independent mediator, or requesting the parties to enter into arbitration; or

4.5.4 Refer the problem to the Amateur Auxiliary.

4.6 If the party issuing the Complaint is not satisfied with the solution proposed by the Director and cannot reach agreement as to a resolution, he may re-file his Complaint with the NESMC Interference Committee.

## 5 Interference Committee

5.1 The Interference Committee is a NESMC standing committee outlined in the NESMC Bylaws (Section X1b). The NESMC President appoints a Chairman for the Committee, who then selects all those who shall serve under him.

5.2 The Committee shall consist of NESMC members. With regard to any Interference Complaint, those Committee members having direct involvement with the parties or other conflict of interest are expected to excuse themselves from conducting the investigation.

5.3 The Committee shall have at its disposal the capability of making all technical analysis of the interference, making records of the situation, and finding sources of interference.

5.4 The Interference Committee shall receive the Complaint and the Director's Report of the interference from the NESMC President, NESMC Section Director, or directly from the station receiving the interference. If investigations were started, all material and documents from this investigation are to be forwarded to the Committee.

5.5 The Interference Committee shall gather all information pertaining to the interference complaint including coordination status, technical parameters, operational history, or other substantive items the Committee views as relevant.

5.6 The Committee shall discuss the problem and make recommendations including technical solutions, mediation, arbitration, or whatever else the Committee deems appropriate at its own discretion. A Report including the solution shall be filed with the Coordinator and sent to all involved parties.

5.7 If the Committee finds that no harmful interference exists, it shall inform the party issuing the Complaint and the NESMC Coordinator.

5.8 Following the conclusion of the Committee, all materials including the Committee's Report, documents, recordings, and correspondence, shall be forwarded to the Coordinator for filing.

5.9 The Interference Committee has a maximum of six (6) months to complete its investigation and submit a resolution.

5.10 If the party issuing the Complaint is not satisfied with the decision of the Interference Committee, he shall petition the NESMC Board of Directors by sending a copy of his Complaint with the signatures of at least ten (10) licensed amateur radio operators who stand in complaint of the interference. Such a petition must include an agreement to accept binding arbitration by the NESMC Board of Directors.

5.11 If the Committee identifies a solution, but is unable to achieve resolution, it shall refer the problem to the Amateur Auxiliary.

## 6 Board of Directors

6.1 The Board of Directors may decide by majority vote to bypass the Section Director and investigate a Complaint on its own. If the Board so bypasses the Director, the Director shall send the NESMC President all data collected regarding the Complaint.

6.2 The Board of Directors shall by majority vote accept a petition of ten (10) licensed amateur operators to take action on a Complaint.

6.3 The Board of Directors may determine that the problem may be solved directly by the Board after attempts of resolution by the Section Director have failed.

6.4 Solutions by the Board may include:

6.4.1 Offering the parties in the dispute employ an independent mediator,

6.4.2 Asking the parties to agree to binding arbitration by either the Interference Committee, the NESMC Board of Directors, or an independent party, or

6.4.3 Referring the problem to a Director in an adjacent section to begin an Investigation.

6.5 The NESMC President shall work on behalf of the Board of Directors to implement the decision of the board. Or in cases where the Board does not reach consensus upon the failure of a Director to achieve resolution, the President shall decide the next course of action based on the advice of the Board.

6.6 When the Board acts as an arbitrator in a dispute, the vote of the President shall not count unless there is a tie vote among those present at the meeting of the Board.

6.7 Arbitration by the Board is always binding. The Board will not arbitrate any disputes unless all parties involved agree beforehand to comply with the Board's findings.

## 7 Amateur Auxiliary

7.1 NESMC shall refer the Complaint to the Amateur Auxiliary if it cannot resolve the Complaint and feels that the situation warrants enforcement.

7.2 NESMC shall supply the Amateur Auxiliary with all information it has concerning the history of the operations in question and the proceedings that led the situation to the Amateur Auxiliary.

## 8 FCC

8.1 If the Amateur Auxillary cannot resolve the Interference Complaint, and the Auxiliary feels that enforcement is necessary, the Auxiliary shall present the Complaint to the FCC.

8.2 If the Auxiliary fails to act on a Complaint in a timely manner, and the NESMC Board of Directors agrees the Complaint warrants FCC enforcement, the President shall be instructed to contact the FCC directly if all reasonable attempts to prompt the Auxiliary to action fail.