

RADIO STATION INSPECTION FRAMEWORK IN UGANDA

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1. INTRODUCTION

The value of radio spectrum is important to the economic and social development of many countries. Control of the radio spectrum by national regulatory authorities has become increasingly important, as countries seek to maximize the efficient use of spectrum, control interference, and promote new technologies without adversely affecting existing ones.

This document is intended to provide radio station inspection framework and outlines technical procedures on how best radio station inspections can be implemented to determine spectrum user compliance in accordance with the Uganda Communications Act, the Uganda Communications (Radio) Regulations, 2005 No. 203 and Spectrum Policy Guidelines.

2. UCC MANDATE ON RADIO STATION INSPECTIONS

The Uganda Communications Act Cap. 106 Sub-section 27(a) & (b), exclusively gives Uganda Communications Commission (UCC) the duty to;

- i) Plan, monitor, manage and allocate the use of the radio frequency spectrum
- ii) Establish technical requirements and technical standards in relation to:-
 - Radio communications apparatus;
 - Interference-causing apparatus or any class of that apparatus;

In addition, Sub-section 54(1(a) & (b)) of the Act gives the Commission the authority to:

- Enter and inspect, at any reasonable time, any place owned by or under the control of an operator. The operator shall be informed of the intended inspection of their radio equipment/station a week before for the routine inspections and two hours for non-routine inspections (triggered). However, inspections and measurements shall be carried out to ensure no/minimal interruptions to operations.
- Enter any place **at any time** on which the Commission or its representative (inspector) has reason to believe that there is any radio apparatus or interference-causing apparatus and examine any radio apparatus, logs, books, reports, data, records, documents or other papers, and **remove the information, document, apparatus or equipment for examination or reproduction.**

Furthermore, UCC Spectrum Policy Guideline 13, part 5.14 provides for inspections of the installations by the Commission to ensure that they are in conformity with the authorized parameters, as part of its frequency authorization requirement.

2.1 Methods for Proper and Efficient Use of Radio Spectrum

Regulatory authorities typically use various methods to ensure that the radio spectrum is used properly and efficiently. These methods include spectrum monitoring/measurements made at a distance, radio station on-site inspections/measurements, and enactment of compliance specifications for certain equipment (both radio and non-radio equipment which generates RF spectral energy). Some combination of these methods, followed by the application of enforcement sanctions (such as formal notice of violations) to problems discovered, have been used successfully by authorities to help control the efficient use of spectrum.

2.2 Purpose of Radio Station Inspections

It is important that administrations, Uganda's inclusive, conduct radio station inspections because the absence of an inspection programme can lead to several negative consequences. Without inspections, the completeness and reliability of a national frequency assignment register/ spectrum management database cannot be guaranteed, since one purpose of the inspection is to verify that the radio station is actually installed and operated in accordance with its assigned parameters and consequently within the licence conditions.

From an administrative point of view, absence of inspections provides a corrupting influence on spectrum users because they may come to believe that they can ignore compliance with their licensed parameters since the risk of detection is lower without on-site inspections and radio spectrum monitoring. In this respect even limited inspections can considerably increase spectrum users' responsibility. The technical and administrative radio regulations of an administration ensure that radio services can operate on a non-interference basis. Spectrum users who operate outside their authorised parameters can generate interference to other users by various methods (such as co-channel and adjacent channel interference, harmonics and other spurious emissions).

The regulations governing radio station inspection should include, among others, procedures of inspections, the rights and obligations of those carrying out inspections (inspectors) and spectrum users, and provisions for resolving disputes between regulator and spectrum users, etc. Obligations of spectrum users should include provisions to ensure free access to radio installations by inspectors and measures to prevent any obstacles to their work.

3. TECHNICAL INSPECTION PROCEDURES

After the issuance of frequency licenses or authorizations, the UCC has the responsibility to ensure that operators/users comply with the technical and administrative requirements of their licenses or authorizations. The radio station inspections can either be classified as planned, triggered, sampling or limited inspections.

Planned inspections increase spectrum users' responsibility on realisation that their radio station installations would be inspected for compliance with the licensed parameters. Triggered inspections are normally initiated by specific impetus such complaints from the affected parties or by request. Sampling inspections are based on statistical measures and mainly effected by inspecting a small sample of many stations to infer to the overall compliance of the spectrum users of the particular frequency band whereas limited inspections are used to check only specific operational parameters which are of interest e.g to confirm installation of external low band pass filters by all FM broadcasters to their broadcasting transmitters.

3.1 General Provision

The technical inspection procedure means the technical requirements and parameters for the telecommunications network, systems and facilities as well as for the radio stations are in compliance with all prescribed conditions on basis of which the relevant permits/assignment letters have been issued.

Telecommunications network, systems and facilities as well as radio stations can be put into operation after the technical inspection has been performed and after all liabilities toward the Commission have been settled. Through its inspection notification the estimated exercise duration will communicated to the operator basing on case by case.

3.2 Request for Technical Inspection and Contents of the Request

Technical inspection shall be performed upon request from the user of telecommunications network, systems or facilities and radio station for which the Commission issued relevant technical permit and radio station licence in accordance with the terms and conditions of the permit. The request shall be submitted to the Commission.

The technical inspection shall be done not later than 30 days from the day the request is submitted to the Commission. The technical inspection may also be performed on the Commission's prompt under various circumstances or following complaint from a user if it is determined that there is congruence with parameters stipulated under technical permit/assignment letters or under radio station licence.

The request for technical inspection shall contain:

- Name, physical address, head office of the user;
- Subject of technical inspection;

- Declaration that the network or radio station has been installed in accordance with approved or revised original structure as submitted to the Commission;
- Manufacturer's Test reports of the installed equipment at the facility or stations

In respect to the request for technical inspection, the radio station owner is required to submit to the Commission a written request for performing technical inspection of the radio station in case of:

- i) Pre- installation inspection of the equipment to verify technical parameters and configuration compliance;
- ii) The radio station for which the licence is issued is being put into operation for the first time;
- iii) Intent to modify the radio station equipment or its installation that would lead to alteration of operational technical parameters of the radio station.

3.3 Expectations of Radio station technical inspection

Radio station technical inspection includes establishing whether the control of prescribed parameters and administrative conditions in the assignment documents are adhered to during the station operations. Radio station inspections facilitate the completeness and reliability of UCC's spectrum users' database, since one purpose of the inspection is to verify that the radio station is actually installed and operated in accordance with its assigned technical parameters.

Furthermore, the technical inspection of radio stations is intended to establish whether its operation:

- a) causes any interference to other radio stations and other telecommunications devices and systems;
- b) Endangers safety and health of people and quality of their lives. Evaluation shall be done in reference to safety set standards by UCC and other responsible organisations like National Environment Management Authority (NEMA) and Uganda National Bureau of Standards (UNBS).

3.4 Contents of Radio Station Technical Inspection

Depending on type of radio station, during radio station technical inspection, it is obligatory to:

a) Directly measure the following parameters:

- accuracy of assigned frequency;
- frequency offset (offset of television transmitters);
- frequencies and levels of spurious emissions;
- bandwidth of emission;
- value of incident and reflected power;
- frequencies and levels of inter-modulation products of the emissions of the tested radio station, in relation to the emissions of other radio stations(s) which are already installed on the same or nearby location (electromagnetic compatibility);
- level of electronic field strength? of radio station in the surrounding inhabited area, as well as the measures of caution and protection, where necessary.

b) Check data in respect of:

- Owners and contact person details of the radio station
- assigned frequencies in respect of temporary use, shared, reserved and other;
- nature of service;
- class of station;
- name and nature of the location of radio station;
- Physical and geographical location of the radio station;
- altitude of the site above sea level;
- station identification;
- manufacturer of the equipment and antenna;
- height of the antenna above ground level;
- type of transmitting antenna or antenna system;
- polarisation;
- directivity of antenna in respect of azimuth;
- Serial numbers of the radio station equipment.

3.5 Performance of Technical Inspection

Technical inspection shall be performed by UCC technical staff as their responsibility. However, where necessary and as appropriate, the Commission may appoint and authorise a specialised company in regard to necessary testing and measuring on behalf of the Commission, in accordance with the technical inspection procedures approved by UCC, especially where the Commission does not have the necessary equipment and instruments.

In the circumstance that the Commission authorises a specialised organisation to undertake radio station technical inspection, the Commission shall enter into contract with that organisation. This contract may be entered into with those organisations which have adequate personnel and technical capacity to perform the required work by the

Commission and which do not have a conflict of interest with the owner/submitter of the request for technical inspection. The Commission shall make a register of organisations which fulfil the requirements to perform technical inspection and shall make these entities public as appropriate.

To increase certainty that the radio station installations are compliant with the set standards, UCC shall register radio equipment vendors and installers and with such an arrangement there will be decrease in the number of non-compliant radio stations, since the vendor or/and installer will be accountable for the station's non-compliance. Further under the conditions set below, vendors or/and installers would try to abide by the terms and conditions to ensure non-termination of registration with UCC, to guarantee them continuity of service to the public. The following terms should be considered;

- a) The vendor or/and installer should be an eligible company registered under the laws of Uganda, by the registrar of companies.
- b) The vendor or/and installer shall be evaluated by the Commission that they are competent to install or configure standard radio equipment based on the set requirements/qualifications, before they can be registered;
- c) No registration fees should be charged for such company to register;
- d) The registered vendors shall be included on UCC Register and known to the public through media and UCC website;
- e) Any radio frequency application or licence to be processed by the Commission, the technical representative of the applicant should be a registered vendor or/and installer;
- f) The vendor/installer in this case being the technical representative should be accountable for inappropriateness of any application or update technical information submitted to UCC;
- g) Installation for such radio equipment should be verified by the registered vendor or/and installer and confirm its compliance before UCC is invited to inspect the station;
- h) The vendor or/and installer should formally commit themselves to UCC that any installation under their supervision is compliant in reference to the frequency assignment conditions and set standards;
- i) The vendors or/and installers should be aware that if they do not abide by the terms, UCC will have a right to disqualify them from the registered vendors or/and installers list, and therefore will not be recognized by UCC

as a vendor or installer of the radio equipment and will not be allowed to represent any radio frequency applicant or user.

- j) However, it should be clear that in case of violation by a radio station, both the owner and technical representative shall be liable to penalty in accordance to the regulations. This situation guarantees combined efforts by the vendor/Installer and the radio station owners.

3.6 Methods used for the Technical Inspection of Radio Station

Methods used for measuring the technical parameters of radio station shall be in accordance with technical regulations and standards of each type of radio station.

The owner of the station or any submitter of the request for radio station technical inspection has to allow the Commission to perform technical inspection undisturbed and provide all the necessary assistance in regard to performing these activities by the Commission or its duly authorised agent.

3.6.1 Cases of Interference Complaint

If an operator/user wishes to report a case of interference to their service, they should do that through recognised reporting avenues i.e. formal letter, email. The radio monitoring team will then investigate and have it addressed as soon as possible. However, administrators of broadcasting services can use a Self Inspection Checklist contained in the Annex that is herewith attached to enable you correct certain anomalies prior to the UCC visiting the site where the interference is reported.

3.6.2 Broadcasting Self Inspection Check List

This self inspection checklist is to assist the management of a broadcasting station to conduct self inspection of their station prior to the Commission visit to the premise. It provides broadcasters the opportunity to review and correct any anomalies of the station associated with the day to day operations of the station, without an actual on-scene visit by the Commission. Although this checklist may not cover the entire requirement for operating an FM Broadcasting Station, you will be able to assess your compliance with the most frequently violated broadcast regulations.

4. REPORT ON RADIO STATION TECHNICAL INSPECTION

The UCC report on the radio station technical inspection shall be submitted within 7 days after completion of the exercise in a prescribed form by the Commission. Such report shall be prepared by the UCC staff or dully authorised specialised organisation by the Commission. The form of the report on technical inspection shall be filled in three copies,

the Commission shall keep two copies and a third copy edited to exclude the confidential information to UCC shall be submitted to the owner whose radio station has been inspected. One of the copies kept by the Commission shall be kept with the Commission registry. In case the technical inspection is performed by the contracted party mentioned in section 3.5 above, this party shall receive one copy of the report.

ANNEX: RADIO STATION OPERATOR CHECK LISTS

1. Administrative Information Applicable to all Radio stations licensees

- a) Is your current contact information updated with the Commission i.e.
 - Office Physical address
 - Postal address
 - Telephone contacts for company, technical representative and administrative representative.
- b) Do you have a current operating frequency license for your radio equipment?
- c) Is the Company operating/owning the station/installations the same as registered by the Commission? If not please, indicate accordingly.
- d) Have you cleared all outstanding frequency/licence operational fees to-date?
- e) Are the stations/installations licensed by the Commission? If so provide the licence references or authorisation documents.
- f) Do you keep and is regularly update a-Log book at the station?
- g) In case of a Community radio station, is a copy of the agreement signed by community leaders/owners readily available for inspection?
- h) Is your radio station/installations accessible any time for inspection by the Commission personnel or its designated inspector(s)?

2. Technical Information for different Radio stations/Services

The following section outlines different technical information that is applicable to different radio equipment and services.

2.1. Broadcasting station

- a) Are you operating your radio station transmitter/equipment from the permitted location by Commission?
- b) Is the list of equipment readily available upon request by the Commission?

- c) Have you updated the Commission on your current physical address and geographical coordinates of the location of your radio equipment mentioned in (a) above?
- d) Have you updated the Commission on your current physical address and geographical coordinates of the location of your radio equipment mentioned in a) above?
- e) Are you using radio equipment registered and authorised by UCC i.e. Make, model, type and other specified parameters?
- f) Is the studio sound proof?
- g) Is the aviation light of the antenna functional?
- h) Where applicable, does the station have aviation light at every 46m interval of height and one at its peak?
- i) Is the mast painted in accordance with the regulations?
- j) Is the station equipment operating at the assigned frequency?
- k) What are the assigned frequencies for your radio station including for; fixed and mobile broadcasting transmitter and Studio-To-Link equipment?
- l) What is the operating output transmitter power? Is it within the permitted limits?
- m) Are the operating conditions of your equipment in accordance with the manufacturer's recommended conditions i.e. Temperature, aeration and humidity?
- n) What is the height of the antenna?
- o) What is the antenna gain?
- p) Is the antenna directional or non directional?
- q) Is the station in compliance with the known modulation limits (that is modulation may not exceed 100percent on peaks of frequent reoccurrence with reference to 75 kHz deviation)?
- r) Is your radio equipment accessible any time for inspection by UCC personnel?

2.2. *Fixed/mobile radio service*

- a) What type of radio station are you operating i.e. Fixed, mobile or Portable?
- b) Are you operating your radio station transmitter/equipment from the permitted location by Commission?
- c) Is the list of technical manual/literature of the radio equipment readily available upon request by the Commission?
- d) Have you updated the Commission on your current physical address and geographical coordinates of the location of your radio equipment mentioned in (b) above?
- e) Are you using radio equipment registered and authorised by Commission (i.e. Make, model, type and other specified parameters)?
- f) Where applicable, does the station have aviation light at every 46m interval of height and one at its peak? Are they working?
- g) Is the mast/tower painted in accordance with the Civil Aviation regulations or requirements?
- h) Is the radio station equipment operating at the assigned frequency(s)?
- i) What are the assigned frequencies for your radio station including those for; fixed mobile and portable radio equipment/stations?
- j) What is the operating output transmitter power (Watts/dB)? Is it within the permitted power limits by UCC?
- k) Are the operating conditions of your equipment in accordance with the manufacturer's recommended conditions i.e. Temperature, aeration and humidity limits?
- l) What is the height of the antenna?
- m) What is the type of antenna polarisation used?
- n) What is the antenna gain (dB)?
- o) Is the antenna directional or non directional?

2.3. VSAT radio service

- a) What is your antenna make and model?
- b) What is the antenna diameter?
- c) What is the antenna gain (dB) for the Uplink and Downlink respectively?
- d) What the Uplink EIRP (Watts)?
- e) What is the antenna polarisation?
- f) What is the antenna height above ground (metres)
- g) What the antenna's noise temperature?
- h) What is the operational Uplink and Downlink frequency range?
- i) What are your station Uplink and Downlink data rates?
- j) Who is your satellite operator?
- k) What are the orbital locations of your reference satellites?
- l) What is your LNA/LNB/LNC make and model?