INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

NOTICE 25 OF 2020

THE ELECTRONIC COMMUNICATIONS ACT 2005, (ACT NO. 36 OF 2005)

NOTICE INVITING COMMENTS REGARDING THE DRAFT RADIO FREQUENCY SPECTRUM ASSIGNMENT PLAN FOR THE FREQUENCY BAND 2500 TO 2690 MHz (IMT2600)

1. The Independent Communications Authority of South Africa ("the Authority"), hereby publishes the **Draft Radio Frequency Spectrum Assignment Plan for the frequency band 2500 to 2690 MHz for consultation** in terms of section 30, read with sections 2 (d), 2 (e), 4, 31(4), and 33 of the Electronic Communications Act (Act No. 36 of 2005), as amended, read with Regulation 3 of the **Radio Frequency Spectrum Regulations, 2015** and the International Mobile Telecommunications (IMT) Roadmap 2014 and the International Mobile Telecommunications (IMT) Roadmap 2019.

2. This Radio Frequency Spectrum Assignment Plan supersedes any previous spectrum assignment arrangements for the same spectrum location.

3. Interested persons are hereby invited to submit written representations, including an electronic version of the representation in Microsoft Word, of their views on the **Draft Radio Frequency Spectrum Assignment Plan for the frequency band 2500 to 2690 MHz** by no later than 16h00 on Friday 13th March 2020.

4. Written representations or enquiries may be directed to:

The Independent Communications Authority of South Africa (ICASA)

350 Witch-Hazel Avenue,

Eco Point Office Park

Eco Park, Centurion

or

Private Bag X10

Highveld Park

0169

Attention:

Mr Manyaapelo Richard Makgotlho

e-mail: rmakgotlho@icasa.org.za

5. All written representations submitted to the Authority pursuant to this notice shall be made available for inspection by interested persons from 17 March 2020 at the ICASA Library or website and copies of such representations and documents will be obtainable on payment of a fee.

6. Where persons making representations require that their representation, or part thereof, be treated confidential, then an application in terms of section 4D of the Independent Communications Authority of South Africa Act, 2000 (Act No. 13 of 2000) must be lodged with the Authority. Such an

application must be submitted simultaneously with the representation. Respondents are requested to separate any confidential material into a clearly marked confidential annexure. If, however, the request for confidentiality is refused, the person making the request will be allowed to withdraw the representation or document in question.

7. The guidelines for confidentiality request are contained in Government Gazette Number 41839 (Notice 849 of 17 August 2018).

DR KEABETSWE MODIMOENG

ACTING CHAIRPERSON

Radio Frequency Spectrum Assignment Plan

Rules for Services operating in the Frequency Band
2500 to 2690 MHz

(IMT2600)

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1 Glossary

In this Radio Frequency Spectrum Assignment Plan, terms used shall have the same meaning as in the Electronic Communications Act, 2005 (Act No. 36 of 2005) as amended; unless the context indicates otherwise:

"3GPP"	means the 3rd Generation Partnership Project (3GPP) which consists of six telecommunications standard development organisations
"Act"	means the Electronic Communications Act, 2005 (Act No. 36 of 2005) as amended
ECC/REC (11) 04	means the Electronic Communications Committee within the European Conference of Postal and Telecommunications Administrations Recommendation (11) 04
ECC/REC (11) 05	Means the Electronic Communications Committee within the European Conference of Postal and Telecommunications Administrations Recommendation (11) (05)
"FDD"	means Frequency Division Duplex
"HCM"	means harmonised calculation method
"IMT"	means International Mobile Telecommunications
"IMT2600"	means IMT in the 2600MHz band
"ITU"	means the International Telecommunication Union
"ITU-R"	means the International Telecommunication Union Radiocommunication Sector
"LTE"	means Long Term Evolution which is a standard for wireless communication of high-speed data for mobile phones and data terminals. It is based on the GSM/EDGE and UMTS/HSPA network technologies
"NRFP"	means the National Radio Frequency Plan 2018 for South Africa
"PCI"	means Physical-Layer Cell Identities
"RFSAP"	means Radio Frequency Spectrum Assignment Plan

"TCA" means terrain clearance angle

"TDD" means Time Division Duplex

2 Purpose

2.1 A RFSAP provides information on the requirements attached to the use of a frequency band in line with the allocation and other information in the NRFP. This information includes technical characteristics of radio systems, frequency channelling, coordination and details on required migration of existing users of the band and the expected method of assignment.

2.2 This Radio Frequency Spectrum Assignment Plan states the requirements for the utilisation of the frequency band 2500 to 2690 MHz for IMT2600 in South Africa.

2.3 The Authority intends to opt for TDD channel arrangement C3 from the Recommendation ITU-R M.1034-5 to increase the usable bandwidth of IMT2600 to 190 MHz.

2.4 Moreover, the increased bandwidth will allow the prospective incumbents to realise the capabilities of IMT2020 systems which require the bandwidth ranges of 80 to 100 MHz.

2.5 The ITU states that IMT systems are mobile systems that provide access to a wide range of telecommunication services including advanced mobile services, supported by mobile and fixed networks, which are increasingly packet-based. The ITU is the internationally recognised entity that has sole responsibility to define and to recommend the standards and frequency arrangements for IMT systems.

2.6 The naming for IMT is developed by the ITU in ITU-R Resolution 56-1. IMT is the root name that encompasses all of IMT 2000 (including

enhancement) and IMT Advanced (including enhancement)[1] and IMT 2020 collectively.

2.7 Key features of IMT are:

- a high degree of commonality of functionality worldwide while retaining the flexibility to support a wide range of services and applications in a cost- efficient manner;
- compatibility of services within IMT and with fixed networks;
- capability of interworking with other radio access systems;
- high quality mobile services;
- user equipment suitable for worldwide use;
- user-friendly applications, services and equipment;
- worldwide roaming capability; and
- enhanced peak data rates to support advanced services and applications.

2.8 Key capabilities of IMT2020:

(a) **Peak data rate:** Maximum achievable data rate under ideal conditions per user/device (in Gbit/s);

(b) **User experienced data rate:** Achievable data rate that is available ubiquitously[2] across the coverage area to a mobile user/device (in Mbit/s or Gbit/s);

(c) **Latency**: The contribution by the radio network to the time from when the source sends a packet to when the destination receives the packet (in ms);

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[1] IMT 2000 and IMT Advance are generations of IMT progressively leading to IMT2020. The relevance is to ensure that the document complies with the ITU Radio Regulations in force in accordance to ITU-R Resolution 56-1.

[2] The term "ubiquitous" is related to the considered target coverage area and is not intended to relate to an entire region or country.

(d) **Mobility:** Maximum speed at which a defined QoS and seamless transfer between radio nodes which may belong to different layers and/or radio access technologies (multi-layer/-RAT) can be achieved (in km/h);

(e) **Connection density:** Total number of connected and/or accessible devices per unit area (per km^2).

(f) **Energy efficiency:** Energy efficiency has two aspects-

(i) on the network side, energy efficiency refers to the quantity of information bits transmitted to/ received from users, per unit of energy consumption of the radio access network (RAN) (in bit/Joule);

(ii) on the device side, energy efficiency refers to quantity of information bits per unit of energy consumption of the communication module (in bit/Joule).

(g) **Spectrum efficiency:** Average data throughput per unit of spectrum resource and per cell[3] (bit/s/Hz); and

(h) **Area traffic capacity:** Total traffic throughput served per geographic area (in Mbit/s/m^2).

3 General

3.1 Technical characteristics of equipment used in IMT2600 systems shall conform to all applicable South African standards, international standards, the ITU and its radio regulations as agreed and adopted by South Africa.

[3] The radio coverage area over which a mobile terminal can maintain a connection with one or more units of radio equipment located within that area. For an individual base station, this is the radio coverage area of the base station or of a subsystem (e.g. sector antenna).

3.2 All installations must comply with safety rules as specified in applicable standards.

3.3 The equipment used shall be certified under South African law and regulations.

3.4 The allocation of this frequency band and the information in this RFSAP are subject to review.

3.5 Frequency band assigned for IMT2600 include frequency range from 2500-2690 MHz.

3.6 The use of this band will be for IMT-TDD to align with the Final Radio Frequency Migration Plan 2019 published in Government Gazette 42337 (Notice 166 of 2019).

3.7 The technologies which can provide IMT2600 services include, but are not limited to:

- LTE,
- LTE Advanced,
- HSPA+, and
- WiMAX.

3.8 Typical technical and operational characteristics of IMT systems as identified as by the ITU are described in the following documents:

- Recommendation ITU-R M.2012-1 (02/2014): Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-Advanced (IMT Advanced).
- Report ITU-R M.2146 Coexistence between IMT-2000 CDMA-DS and IMT-2000 OFDMA TDD WMAN in the 2 500-2 690 MHz band operating in adjacent bands in the same area.
- Report ITU-R 2113-1: Sharing studies in the 2 500-2 690 MHz band between IMT-2000 and fixed broadband wireless access systems including nomadic applications in the same geographical area.
- Report ITU-R M.2045-0: Mitigating techniques to address coexistence between IMT-2000 time division duplex and frequency division

duplex radio interface technologies within the frequency range 2 500-2 690 MHz operating in adjacent bands and in the same geographical area.

- Report ITU-R M.2074: Report on Radio Aspects for the terrestrial component of IMT-2000 and systems beyond IMT-2000.
- Report ITU-R M.2041: Sharing and adjacent band compatibility in the 2.5 GHz band between the terrestrial and satellite components of IMT-2000.
- Recommendation ITU-R M.1645 Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000.
- Recommendation ITU-R M.1036-5: Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (RR).

4 Channelling Plan

4.1 The frequency band 2500-2690MHz provides a total bandwidth of 190 MHz for the IMT service.

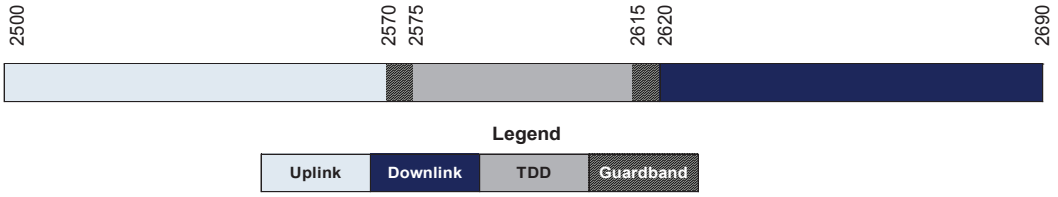
4.2 Channel arrangements are indicated in ITU Recommendations: Rec. ITU-R M.1036-5.

4.3 The ITU has recommended a list of channel arrangements shown below:

Frequency arrangements	Paired arrangements					Un-paired arrangements (e.g. for TDD) (MHz)
	Mobile station transmitter (MHz)	Centre gap (MHz)	Base station transmitter (MHz)	Duplex separation (MHz)	Centre gap usage	
C1	2 500-2 570	50	2 620-2 690	120	TDD	2 570-2 620 TDD

C2	2 500-2 570	50	2 620-2 690	120	FDD	2 570-2 620 FDD DL external
C3	Flexible FDD/TDD					

Option C1 is the current channel arrangement as depicted in the figure below:



Option C3 is proposed as the best option for South Africa IMT-TDD to align with the Final Radio Frequency Migration Plan 2019 published in Government Gazette 42829 (Notice 600 of 2019) and to increase the usable bandwidth of IMT2600, see the figure below:

5 Requirements for usage of radio frequency spectrum

5.1 This section covers the minimum key characteristics considered necessary in order to make the best use of the available frequencies.

5.2 The use of the band is limited to IMT services.

5.3 Only systems using digital technologies that promote spectral efficiency will be issued with an assignment. Capacity enhancing digital techniques is being rapidly developed and such techniques that promote efficient use of spectrum, without reducing quality of service are encouraged.

5.4 In some cases, a radio system conforming to the requirements of this RFSAP may require modifications if harmful interference is caused to other radio stations or systems.

5.5 The allocation of spectrum and shared services within these bands are found in the NRFP and an extract of NRFP is shown in **Appendix A**.

5.6 Maximum radiated power

5.6.1 Base Station transmissions should not exceed 61dBm/5MHz EIRP.

5.6.2 Mobile Station transmissions should not exceed 23dBm EIRP.

5.6.3 On a case to case basis, higher EIRP may be permitted if acceptable technical justification is provided.

5.6.4 Where appropriate subscriber terminal station should comply with the technical specification outlined under "3GPP TS 36.521-1" or latest version.

5.7 In some cases, a radio system conforming to the requirements of this RFSAP may require modifications if major interference is caused to other radio stations or systems.

5.8 Criteria and guidelines for interference mitigation are described in **Appendix D.**

6 Implementation

6.1 This RFSAP shall be effective on the date of publication in the Government Gazette.

6.2 No new assignments for IMT2600 in the band 2500 – 2690 MHz shall be approved unless they comply with this RFSAP.

7 Co-ordination Requirements

7.1 Use of these frequency bands require coordination with the neighbouring countries within the coordination zones of 6 kilometres in case of LTE-to-LTE or 9 kilometres in case of LTE-to-other technologies from the

neighbouring country. The coordination distance is continuously being reviewed and may be updated from time to time.

7.2 The following field strength thresholds have to be assured based on ECC/REC (11) 04 for 790-862MHz. Operator-to-operator coordination may be necessary to avoid interference.

7.3 In general stations and systems may be used without coordination with a neighbouring country if the mean field strength produced by the cell (all transmitters within the sector) does not exceed the value of 55dBμV/m/5MHz at an antenna height of 3m above ground at the borderline between countries, and does not exceed a value of 29dBμV/m/5MHz at an antenna height of 3m above ground at a distance of 9 km inside the neighbouring country.

7.4 In the case that LTE is deployed both sides of the border the field strength levels can be increased to 59 dBμV/m/5MHz and 41 dBμV/m/5MHz at 6 km.

7.5 Synchronisation should be achieved including that of the field strength levels if TDD is in operation across both sides of a border.

7.6 For field strength, predictions the calculations should be made according to **Appendix B**. In cases of other frequency block sizes 10*log (frequency block size/5MHz) should be added to the field strength values e.g.:

BW (MHz)	Field strength level at 3 m height	Field strength level at 3 m height

	(general case)	(LTE case)
5 MHz	55.0 dBμV/m/5MHz @0km	59.0 dBμV/m/5MHz @0km
	29.0 dBμV/m/5MHz @9km	41.0 dBμV/m/5MHz @6km
10 MHz	58.0 dBμV/m/10MHz @0km	62.0 dBμV/m/10MHz @0km
	32.0 dBμV/m/10MHz @9km	44.0 dBμV/m/10MHz @6km
15 MHz	59.8 dBμV/m/15MHz @0km	63.8 dBμV/m/15MHz @0km
	33.8 dBμV/m/15MHz @9km	45.8 dBμV/m/15MHz @6km
20 MHz	61.0 dBμV/m/20MHz @0km	65.0 dBμV/m/20MHz @0km
	35.0 dBμV/m/20MHz @9km	47.0 dBμV/m/20MHz @6km

7.7 If neighbouring administrations wish to agree on frequency coordination based on preferential frequencies, while ensuring a fair treatment of different operators within a country the Authority will add the following within mutual agreements:

7.7.1 Stations of IMT systems may be operated without coordination if the mean field strength produced by the cell (all transmitters within the sector) does not exceed the value of 15 dBμV/m/5 MHz at 10% time, 50% of locations at 3 metres above ground level at the borderline

7.7.2 Technical analysis may be conducted by the Authority before an assignment is issued according to **Appendix B** taken from ECC/REC (11) 05.

7.7.3 Specific information regarding coordination may be found in **Appendix C**, taken from Cross-Border Frequency Coordination: Harmonised Calculation Method for Africa (HCM4A) Agreement.

7.7.4 In the event of any interference, the Authority will require affected parties to carry out coordination. If the interference continues to be unresolved

after 24 hours, the affected parties may refer the matter to the Authority for a resolution. The Authority will decide the necessary modifications and schedule of modifications to resolve the dispute. The Authority will be guided by the interference resolution process as shown **Appendix C**.

7.7.5 Assignment holders shall take full advantage of interference mitigation techniques such as antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction l loss), site selection, and/or power control to facilitate the coordination of systems.

8 Assignment

8.1 Extended Approach

The assignment of frequency will take place in accordance with the Extended Application Procedures prescribed in terms of the applicable Radio Frequency Spectrum Regulations of 2015, as amended.

9 Revocation

9.1 Existing radio frequency spectrum licences for the use of the band are to be amended or revoked as per the frequency migration timetable.

10 Radio Frequency Migration

10.1 There is currently one incumbent in the band between 2570 MHz to 2590 MHz.

10.2 The incumbent in the band shall perform in-band migration to the start of this band thus occupying the frequency range of 2500 MHz to 2520 MHz upon finalisation of this Radio Frequency Spectrum Assignment Plan.

11 Radio Frequency Amendment

11.1 The Radio Frequency Spectrum Licence shall be amended upon finalisation of this Radio Frequency Spectrum Assignment Plan to reflect the in-band migration as stated in section 10 of this document.

Appendix A National Radio Frequency Plan

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.150 5.399 5.401 5.402	5.150 5.399 5.402		
2 500-2 520 MHz FIXED 5.410 MOBILE except aeronautical mobile 5.384A 5.412	**2 500-2 520 MHz** MOBILE except aeronautical mobile 5.384A NF9	IMT2600 MTX (2500 – 2570 MHz)	Paired with 2620 – 2690 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Recommendation ITU-R M.1036
2 520-2 655 MHz FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.412 5.418B 5.418C	**2 520-2 655 MHz** MOBILE except aeronautical mobile 5.384A NF9 5.339	IMT2600 MTX (2500 – 2570 MHz) IMT2600 TDD (2570 – 2620 MHz) IMT2600 BTX (2620 – 2690 MHz) IMT (2500-2690 MHz)	Paired with 2620 – 2690 MHz Paired with 2500 – 2570 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Recommendation ITU-R M.1036 The band 2 500-2 690 MHz is also used for BFWA in some SADC countries

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
2 655-2 670 MHz FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.208B 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	**2 655-2 670 MHz** MOBILE except aeronautical mobile 5.384A NF9 Radio astronomy 5.149	IMT2600 BTX (2620 – 2690 MHz); IMT (2500-2690 MHz)	Paired with MTX 2500 – 2570 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Recommendation ITU-R M.1036
2 670-2 690 MHz FIXED 5.410 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	**2 670-2 690 MHz** MOBILE except aeronautical mobile 5.384A Radio astronomy 5.149	IMT2600 MTX (2620 – 2690 MHz)	Paired with 2500 – 2570 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Recommendation ITU-R M.1036
2 690-2 700 MHz	**2 690-2 700 MHz** RADIO ASTRONOMY		

Appendix B Propagation Model

The following methods are proposed for assessment of anticipated interference inside neighboring countries based on established trigger values. Due to complexity of radio-wave propagation nature, different methods are proposed to be considered by Administrations and are included here for guidance purposes only. It should be noted that the following methods provide theoretical predictions based on available terrain knowledge. It is impractical to recreate these methods with measurement procedures in the field. Therefore, only some approximation of measurements could be used to check compliance with those methods based on practical measurement procedures. The details of such approximation are not included in this recommendation and should be negotiated between countries based on their radio monitoring practices.

Path specific model

Where appropriate detailed terrain data is available, the propagation model for interference field strength prediction is the latest version of ITU-R Rec. P.452, For the relevant transmitting terminal, predictions of path loss would be made at x km steps along radials of y km at z degree intervals[4]. The values for those receiver locations within the neighbouring countries would be used to construct a histogram of path loss – and if more than 10% of predicted values exceed the threshold the station should be required to be coordinated.

Site General model

If it is not desirable to utilise detailed terrain height data for the propagation modelling in the border area, the basic model to be used to trigger coordination between Administrations and to decide, if coordination is necessary, is ITU-R

[4] Values for x, y, z and path specific field strength levels are to be agreed between the administrations concerned

Rec. P.1546, "Method for point to area predictions for terrestrial services in the frequency range 30 to 3000 MHz". This model is to be employed for 50% locations, 10% time and using a receiver height of 3m. For specific reception areas where terrain roughness adjustments for improved accuracy of field strength prediction are needed, administrations may use correction factors according to terrain irregularity and/or an averaged value of the TCA parameter in order to describe the roughness of the area on and around the coordination line.

Administrations and/or operators concerned may agree to deviate from the aforementioned model by mutual consent in writing.

Area calculations

In the case where greater accuracy is required, Administrations and operators may use the area calculation below. For calculations, all the pixels of a given geographical area to be agreed between the Administrations concerned in a neighbouring country are taken into consideration. For the relevant base station, predictions of path loss should be made for all the pixels of a given geographical area from a base station and at a receiver antenna height of 3m above ground.

For evaluation,

- only 10 percent of the number of geographical areas between the borderline (including also the borderline) and the 6 km line itself inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the borderline in Annex 1 and 2 at a height of 3 m above ground.
- only 10 percent of the number of geographical areas between the 6 km (including also 6 km line) and 12 km line inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the 6 km line in Annex 1 and 2 at a height of 3 m above ground.

It is recommended that during area calculations not only detailed terrain data but also clutter data be taken into account. Use of correction factors for clutter is crucial in particular where the border area is 'open' or 'quasi-open' from the

point of view of clutter or where the interfering base station is just a few kilometres from a borderline.

If the distance between a base station and a terrain point of a borderline is closer than or equal to 1 km, free space propagation model needs to be applied. Furthermore, if there is no terrain obstacle within the 1st Fresnel zone, also the free space propagation model should be applied.

If clutter data is not available, it is proposed to extend the usage of free space propagation model to a few kilometres, depending on the clutter situation in border areas.

For area type interference calculations, propagation models with path specific terrain correction factors are recommended (e.g. Recommendation ITU–R P.1546 with the terrain clearance angle correction factor TCA, HCM method with the terrain clearance angle correction factor or Recommendation ITU–R P.1812).

As to correction factors for clutters 'open area' and 'quasi-open area', 20 dB and 15 dB should be used respectively. Recommendation ITU–R P.1406 should be used if a finer selection of clutter is required.

It must be noted that terrain irregularity factor Δh is not recommended to be used in area calculations. Administrations and/or operators concerned may agree to deviate from the aforementioned models by mutual consent in writing.

Appendix C Cross Boarder Coordination

The following is extracted from Cross-Border Frequency Coordination: Harmonized Calculation Method for Africa (HCM4A) Agreement ("**the Agreement**")

Frequencies requiring co-ordination

1. In the case of the Land Mobile Service a transmitting frequency shall be co-ordinated if the transmitter produces field strength, at the border of the country of the Affected Administration, which, at a height of 10 m above ground level, exceeds the maximum permissible interference field strength as defined in Annex 1 of the Agreement. A receiving frequency shall be co-ordinated if the receiver requires protection.
2. It is strongly recommended to co-ordinate radio-relay links in the Fixed Service if the shortest distance from the border of at least one station is less or equal to the one defined in Annex 11 of the Agreement. All stations which may cause harmful interference to stations in other countries or need protection shall be co-ordinated regardless of the distance.
3. Any Administration wishing to take into operation a station shall circulate a request for co-ordination to all Affected Administrations for their comment. This request shall include the characteristics in accordance with Annex 2A and Annex 2B of the Agreement.
4. If, for the purpose of technically evaluating this request, the Affected Administration requires further information in accordance with Annex 2A and Annex 2B of the Agreement, it shall ask for this information within 30 days upon receipt of the request for co-ordination. After this request, complete information concerning a request for co-ordination shall be sent by the requesting administration within 30 days, otherwise the coordination request shall be deemed null and void.
5. Having received complete information concerning a request for co-ordination, the Affected Administration shall evaluate this information in

accordance with the provisions of this Agreement. It shall notify the Requesting Administration of the outcome within 45 days.

6. If the Requesting Administration does not receive a reply within 45 days, it must send a reminder. The Affected Administrations must respond to this reminder with the outcome within 20 days.

7. If the Affected Administration fails to respond within the period fixed under paragraph 6, it shall be deemed to have given its consent, and the station shall be considered co-ordinated.

8. The periods specified under paragraphs 5 and 6 may be changed by mutual consent in writing.

9. Any co-ordinated frequency assignment shall be notified to the Affected Administrations as soon as the corresponding station is put into operation but not later than 180 days upon approval. Following such notification of the assignment, this assignment shall be included in the Frequency Register.

10. If no notification of assignment is given within 180 days, the Affected Administration shall send a reminder to the Requesting Administration that has asked for co-ordination. If no notification of assignment is given within another 30 days, the request for co-ordination shall be deemed null and void.

11. No notification shall be required if the frequency registers are exchanged semi-annually.

12. The Administration wishing to change the technical characteristics of stations registered in the Frequency Register, shall notify the Affected Administrations of its intentions. Co-ordination shall be required if this change causes the probability of interference to increase in the affected country. If the situation remains unchanged with regard to interference or if it improves, the Administrations affected shall only be informed of such a change. The entry in the Frequency Register shall be corrected accordingly.

13. In special cases, the Administrations may assign frequencies for temporary use (up to 45 days) without co-ordination provided this does

not cause harmful interference to co-ordinated stations. As soon as possible, the Affected Administration affected shall be notified of the planned taking into operation. Such stations shall immediately be taken out of operation if they cause harmful interference to co-ordinated stations of the affected country. These assignments shall be made on preferential frequencies as far as possible.

14. If an assignment is no longer in force, the competent Administration shall notify the affected Administration within three months and the entry in the Frequency Register has to be deleted.

Preferential frequencies

15 Frequencies in the frequency bands specified in paragraph 2 may be defined by prior bi-lateral or multilateral agreements concluded in the framework of this Agreement as preferential frequencies for given Administrations.

16 The Administration which has been granted a preferential right may put stations operating on preferential frequencies within the terms of the relevant bi-lateral or multilateral agreements into use without prior co-ordination. If the conditions for the protection of the receiver in the mobile service are not defined in bi-lateral or multilateral agreements, paragraph 16 of Annex 1 of the Agreement will apply.

17 Mutually agreed preferential frequencies granted to an Administration shall have priority rights over assignments made to other Administrations concerned.

18 The entry into service of stations using preferential frequencies shall be notified to the Administrations affected, unless otherwise laid down in bi-lateral or multilateral agreements. The notification shall include the characteristics as set out in Annex 2A and Annex 2B of the Agreement. These frequencies and their technical characteristics shall be entered

with status "P" into the Frequency Register. No response to such a notification is required.

19 Preferential frequencies to be assigned on conditions other than those agreed in bi-or multilateral agreements mentioned in Section 1.3.2 shall be co-ordinated in accordance with paragraph 1.

20 Following a positive co-ordination procedure in accordance with Section 4.1, Administrations may bring into use another Administration's preferential frequencies. These shall have the same rights as frequencies co-ordinated in accordance with Paragraph 1.

21 If the existing radio networks of one Administration cause harmful interference to the stations operated by another Administration on frequencies to which it has a preferential right, or if, in particular cases, frequency assignments not enjoying preferential rights have to be adjusted, the Administrations concerned shall determine the transition period by mutual consent in writing.

Frequencies for planned radio communication networks

22 Prior to the co-ordination of a planned radio communication network the Administrations may embark on a consultative procedure in order to facilitate the taking into operation of this new network. The request for consultation shall include the planning criteria as well as the following data:

a. planned frequencies (transmitting and receiving frequency of the station);
b. coverage area of the entire radio communication network;
c. class of the station;
d. the coverage area of a station;

e. effective radiated power;
f. maximum effective antenna height;
g. designation of the emission;
h. network development plan;
i. antenna characteristics for stations belonging to the network.

23 The Affected Administration shall acknowledge receipt of the request for consultation and communicate its reply within 60 days.

24 In complicated planning issues this consultation may require a bi-lateral or multilateral consultation meeting in order to assist the Administration planning a radio communication network in coming to a quicker solution.

25 To co-ordinate frequencies for a planned radio communication network the Affected Administration shall apply, no sooner than three years prior to the planned taking into operation of the network, the procedure described in Paragraph 1 together with the following changes:

26 The receipt of the request for co-ordination shall be acknowledged.

27 If there is no prior consultation the Affected Administration shall submit its reply within 180 days from the day of the receipt of the request for co-ordination. Any request for co-ordination following a consultation process shall be responded to within 120 days.

28 The Administration requesting co-ordination shall notify to the Affected Administration the date at which the radio communication network will be taken into operation.

29 Stations forming part of the radio communication network shall be entered into the Frequency Register together with the date of the termination of the co-ordination procedure and enjoy the same rights as the stations co-ordinated in accordance with Paragraph 1.

30 Co-ordination shall be null and void for those co-ordinated stations which have not been taken into operation within 30 months of the termination of the co-ordination procedure.

Frequencies used on the basis of geographical network plans

31 Geographical network plans covering certain parts of the frequency bands indicated in Section 1.2 may be prepared and co-ordinated, divergence from the defined parameters being permissible, subject to prior agreement reached between the Affected Administrations. These frequencies shall be entered in the Frequency Register. On the basis of the geographical network plans adjusted in this fashion, an Administration shall be authorised to put stations into service without prior co-ordination with the Administration with which the plan has been agreed by mutual consent in writing.

32 Frequencies used on the basis of geographical network plans and intended to be assigned on conditions other than those agreed between Administrations concerned, shall be co-ordinated in accordance with Paragraph 1.

Frequencies using preferential codes

33 Preferential code groups or preferential code group blocks may be agreed between Administrations concerned where centre frequencies are aligned.

34 The Administration which has been granted a preferential right may put stations operating on preferential code groups or preferential code group blocks within the terms of the relevant bi- or multilateral agreements into use without prior co-ordination.

35 Preferential code groups or preferential code group blocks granted to an Administration shall have priority rights over assignments made to other Administrations concerned.

36 The entry into service of stations using preferential code groups or preferential code group blocks shall be notified to the Administrations affected, including the characteristics as set out in Annex 2A of the Agreement, unless otherwise laid down in bi- or multilateral agreements. These frequencies and their technical characteristics shall be entered with status "P" in the Frequency Register. No response to such notification is required.

37 Frequencies using preferential code groups or preferential code group blocks which have to be assigned on conditions other than those agreed in bi-lateral or multilateral agreements mentioned in Section 1.3.6 shall be co-ordinated in accordance with Paragraph 1.

38 Following a positive co-ordination procedure in accordance with Paragraph 1, Administrations may bring into use frequencies using another Administration's preferential code groups or preferential code group blocks. These shall have the same rights as frequencies co-ordinated in accordance with Paragraph 1.

39 If the existing radio networks of one Administration cause harmful interference to the stations operated by another Administration on frequencies using preferential code groups or preferential code group blocks, or if, in particular cases, frequency assignments not enjoying preferential code groups rights or preferential code group blocks rights, have to be adjusted, the Administrations concerned shall determine the transition period by mutual consent in writing.

Frequencies used on the basis of arrangements between operators

40 Operators in neighbouring countries are allowed to conclude mutual arrangements on the condition that the Administrations concerned have signed an agreement authorizing such arrangements.

41 Such arrangements shall be the subject of agreements submitted to the preliminary validation of concerned Administrations.

42 Arrangements between operators may deviate from the technical parameters or other conditions laid down in the annexes of this Agreement or in relevant bi-lateral or multilateral agreements between the Administrations concerned.

Evaluation of requests for co-ordination

43 In evaluating the requests for co-ordination, the Administration affected shall take into account the following frequencies:

a. frequencies entered in the Frequency Register;

b. frequencies used on the basis of bi- or multilateral agreements;

c. frequencies awaiting an answer to a co-ordination request (in chronological order of requests).

44 A request for co-ordination of a transmitting frequency in the Land Mobile Service may only be rejected if the respective station:

45 produces an interference field strength exceeding the maximum permissible value as given in Annex 1 of the Agreement at a station entered in the Frequency Register or

- intends to use a frequency without meeting the conditions agreed upon bi- or multilaterally or
- produces an interference field strength exceeding the maximum permissible value as given in Annex 1 of the Agreement in the case of a station awaiting an answer to a co-ordination request or
- does not meet the conditions governing the maximum cross-border ranges of harmful interference as given in Annex 1 of the Agreement.

46 Within the Land Mobile Service, the request for protection of a receiver may only be rejected if

- at least one of the co-ordinated transmitters of the Administration affected produces at the respective receiver an interference field strength which is higher than the maximum permissible interference field strength given in Annex 1 of the Agreement or
- the protection of the receiver would restrict the use of a preferential frequency of the Administration affected under the conditions agreed upon bi-laterally or multilaterally or
- one of the transmitters awaiting an answer to a co-ordination request of the Administration affected produces at the respective receiver an interference field strength which is higher than the maximum permissible interference field strength given in Annex 1 of the Agreement or
- the conditions governing the cross-border ranges of harmful interference as given in Annex 1 of the Agreement are not met.

47 A request for co-ordination of a transmitter frequency in the Fixed Service may only be rejected if the respective station:

- produces a threshold degradation exceeding the maximum permissible value given in Annex 9 of the Agreement at a station entered in the Frequency Register or
- is intended for using a frequency without meeting the conditions agreed upon bi-laterally or multilaterally or
- produces a threshold degradation exceeding the maximum permissible value given in Annex 9 of the Agreement in the case of a station awaiting an answer to a co-ordination request.

48 Within the Fixed Service, the protection of a receiver may only be rejected if:

- the request for co-ordination for the associated transmitter has been refused,

- the protection of the receiver would restrict the use of a preferential frequency of the Administration affected under the conditions agreed upon bi-laterally or multilaterally.

49 If protection from interference cannot be guaranteed, a request for co-ordination must be accepted with "G" (Appendix 9 to Annex 2A and Annex 2B of the Agreement).

50 In case a request for co-ordination is rejected or a conditional reply is given to such a request, the reasons shall be given for this, indicating, if appropriate, either the radio station to be protected or the radio station which could cause harmful interference to the planned radio station.

51 An Administration making reference to Section 2.4 of the Agreement may only respond to a request for co-ordination by indicating "C" or "G" in accordance with Appendix 9 to Annex 2A and Annex 2B of the Agreement. No reason needs to be given for "G" in accordance with Section 4.7.7; reference to Section 2.4 shall be sufficient.

Evaluation in connection with tests

52 In order to make more efficient use of the radio spectrum, to avoid possible harmful interference and facilitate the enhancement of existing networks, the following procedure may be used:

- If the Affected Administrations arrive at different results in their evaluations of the interference situation, or if the request for co-ordination currently being processed justifies a trial basis, they shall agree to open the service on a trial basis. Stations falling into the above cases shall be given a temporary status “D” in accordance with Appendix 9 to Annex 2A and Annex 2B of the Agreement, until final status can be accomplished.

53 The provisions on measurement procedures are given in Annex 7 of the Agreement.

54 On completion of the tests a final decision shall be communicated to the requesting Administration within 30 days, indicating the measured values of the interference field strength.

Exchange of Lists

Each Administration shall prepare an up-to-date Frequency Register in accordance with Section 1.4. The List corresponding to each affected Administration contained in the Frequency Register shall be exchanged bilaterally at least once every six months. The Administrations shall undertake to use the data appearing in the Lists of other Administrations for service purposes only. These Lists may not be communicated to other Administrations or other third parties without the consent of the Administration affected.

Appendix D **Interference Resolution Process**

When requesting coordination, the relevant characteristics of the base station and the code or PCI group number should be forwarded to the Affected Administration. All of the following characteristics should be included:

a) carrier frequency [MHz]

b) name of transmitter station

c) country of location of transmitter station

d) geographical coordinates [latitude, longitude]

e) effective antenna height [m]

f) antenna polarisation

g) antenna azimuth [deg]

h) antenna gain [dBi]

i) effective radiated power [dBW]

j) expected coverage zone or radius [km]

k) date of entry into service [month, year].

l) code group number used

m) antenna tilt [deg]

The Affected Administration shall evaluate the request for coordination and shall within 30 days send the result of the evaluation to the Requesting Administration. If in the course of the coordination procedure the Affected Administration requires additional information, it may request such information.

During the course of the coordination procedure an Administration may request additional information from the other Administration. If no reply is received by the Requesting Administration within 30 days, it may send a reminder to the Affected Administration. Failure to respond within 30 days, following communication of the reminder, shall be deemed as consent and the code co-

ordination may be put into use with the characteristics given in the request for coordination.

The periods mentioned above may be extended by mutual consent in writing.