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27 August 2021

Mr. Manyaapelo Richard Makgotlho
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Via email: rmakgotlho@icasa.org.za

Dear Mr Makgotlho

**RE: TELKOM'S WRITTEN SUBMISSION ON THE DRAFT UPDATE OF THE NATIONAL RADIO FREQUENCY PLAN 2021**

Telkom SA SOC LTD ("**Telkom")** welcomes the opportunity to provide written comments on the draft updated National Radio Frequency Plan 2021, as published in Government Gazette No. 44803 (Notice 403 of 2021) on 9 July 2021 ("**draft Plan**"). Comments on the draft Plan is due no later than 16h00 on Friday, 27 August 2021.

Please find herewith Telkom's written comments on the draft Plan. Telkom would appreciate an opportunity to make oral representations at the public hearings scheduled to take place from 7 - 9 September 2021.

Yours Sincerely

**Dr Siyabonga Mahlangu**
**Group Executive: Regulatory Affairs and Government Relations**

# Submission to the Independent Communications Authority of South Africa

Draft National Radio Frequency Plan 2021 (“draft Plan”)

Government Gazette No. 44803 (Notice 403 of 2021) dated 9 July 2021

Telkom SA SOC Ltd
Submission date: 27 August 2021

## 1. Introduction

The National Radio Frequency Plan ("**NRFP**") is the most critical document in the spectrum domain and underpins current and future use of the radio frequency spectrum, which is shared between more than 40 radiocommunication services locally an internationally. All decisions pertaining to the use and licensing of spectrum stems from the NRFP. It is therefore of utmost importance that the NRFP is robust, clear, accurate and aligned to South Africa's unique national spectrum requirements. An ambiguous or technically inaccurate NRFP will inevitably lead to downstream problems as far as the licensing and utilisation of spectrum is concerned. This could result in litigation, severe financial implications for licensees that must incur corrective migrations and damaging international relations where cases of harmful interference occur with international spectrum users.

The updates contained in the draft NRFP-21 ("draft Plan") may be categorised broadly in terms of amendments based on the World Radiocommunications Conference 2019 ("WRC-19") decisions and general amendments to ensure that the NRFP stays abreast with international and local technological and market developments. WRC-19 decisions are informed by an intense four (4) year study period, which thoroughly assesses the regulatory, operational, and technical implications of a decision and as such, incorporation of these decisions into the draft Plan is a relatively simple task. However, it remains paramount that radiocommunication service options for national use in the same frequency band be considered carefully as this will determine the local rules in the use of the various radio frequency bands. Sharing between radiocommunication services must be addressed through appropriate frequency coordination procedures.

Telkom welcomes the opportunity to comment on the draft Plan. Telkom's submission comprises two parts namely general comments and band specific comments, which are contained in sections 2 and 3 respectively.

## 2. General Comments

### 2.1 IMT frequency bands

IMT frequency bands generally lead to a situation where the demand for access to these bands exceeds the supply. Therefore, it is important to manage access to these bands in an orderly fashion to avoid a "land grab" of spectrum where licensees, using the principle of first-come-first-serve, to apply for access to these bands before the necessary regulations are in place to address the licensing and use of these bands. Not only may this lead to an uncompetitive scenario where some licensees may acquire large chunks or majority of spectrum before others, it may also lead to issues pertaining to sharing and coordination with the incumbent licensees in some frequency bands.

It is anticipated that a Radio Frequency Spectrum Assignment Plan ("RFSAP") will be developed for each IMT frequency band, where not already done, to deal with, amongst others, sharing and migration of existing users, licensing process to be followed, whether the band will be shared or assigned on an exclusive basis, frequency channelling arrangements to be adopted, etc. Further details pertaining to RFSAPs are contained in regulation 3 of the Radio Frequency Spectrum Regulations, 2015.

The migration of incumbent users, where needed, will be addressed through the Frequency Migration Plan, which may also state the need for a feasibility study in some cases due to the complexity of migration in the frequency band. The updating of the NRFP will supersede the updating of the frequency migration plan and the development of the necessary RFSAPs and it is therefore paramount that the NRFP provides clarity on the intention of the Authority regarding the licensing of IMT frequency bands. This will also avoid the need to publish a moratorium on licensing of IMT frequency bands, as was done recently (Government Gazette 44167, Notice 47 of 2021 dated 17 February 2021). See also comments in section 2.5 regarding radio frequency migration plan.

Telkom proposes the following text to be added to NF9 (*IMT Frequency Bands - Terrestrial*):

> "*The Authority will develop a RFSAP for all listed IMT frequency bands in terms of regulation 3 of the Radio Frequency Spectrum Regulations, 2015 as amended. The Radio frequency Spectrum Assignment Plan will address, amongst others, sharing and migration of existing users, licensing process to be followed, whether the band will be shared or assigned on an exclusive basis, frequency channelling arrangements to be adopted, etc. The Authority will therefore license IMT frequency bands in terms of a Radio Frequency Spectrum Assignment*

*Plan; no applications for new licenses in these bands will be considered prior to the publication of the assignment plans."*

In addition, Telkom also recommends that all new IMT frequency bands, including the mmWave bands adopted at WRC-19, be added to NF9 and that a reference to NF9 be added to all relevant frequency bands in the "SA allocations and footnotes" column in the NRFP. The below listed IMT bands should be added to NF9 (with its associated WRC Resolution, footnote, and channelling plan).

1. IMT850: 825-830 MHz // 870-875 MHz (Res 224)
2. IMT3300: 3300-3400 MHz (Res 223)
3. IMT4900: 4800-4990 MHz (Res 223)
4. IMT26: 24.25-27.5GHz (Res 242)
5. IMT40: 37-43.5 GHz (Res 243)
6. IMT48: 47.2-48.2 GHz (Res 243)
7. IMT66: 66-71 GHz (Res 241)

Annual spectrum fees payable are determined in accordance with the prescribed Radio Frequency Spectrum Fees Regulations, 2015 as amended. As also reflected in the Authority's report "*The State of 5G in South Africa*", the pricing regime for mmWave frequency bands will have to be reviewed to accommodate the large bandwidth requirements. Therefore, the spectrum fees regulations will also have to be amended prior to the licencing of the mmWave frequency bands.

The Authority added "*International Mobile Telecommunications (IMT)*" to several frequency bands under the "Typical Applications" column, especially the mmWave bands. In line with Telkom's comments in section 2.3, these entries should be deleted until these systems may be licensed or deployed in these bands. For example, in the 38/40 GHz range, it is not evident at this stage that the entire frequency range 37.0-43.5 GHz will be made available for IMT; some parts of this range may be used for other services such as fixed and/or satellite. This will be determined through the processes to follow, e.g. the RFSAP's to be developed. A note regarding possible future use of IMT could be added to the "Notes and Comments" column.

## 2.2 Urgent need for frequency coordination procedures

Many frequency bands are shared between services, for example, fixed or mobile with satellite services. Without frequency coordination between these systems, the likelihood for harmful interference is real, as was also evident in the recent deployment of FWA systems in the 3.7 GHz band causing harmful interference to satellite earth station receivers. As the use of frequency bands intensifies, the likelihood of harmful interference being caused is increasing exponentially and likely to occur more frequently.

This status quo is further compounded by the fact that many frequency bands are "available" for shared usage between radiocommunication services, for example terrestrial services (e.g. fixed and mobile) and satellite services. Currently, some of these bands are used by only one service, for example, fixed services, on a de facto exclusive basis. The introduction of new services on a shared basis within these bands will require coordination procedures to be implemented prior to the shared use of the band between all licensees to ensure that harmful interference is proactively managed successfully before it occurs with reactive consequences.

Telkom again urges the Authority to develop the necessary coordination procedures for shared bands. Also, there is a need to ensure that new services are introduced in a disciplined manner in shared bands where incumbent services have already been deployed. In some cases, there will be a need to develop a Radio Frequency Spectrum Assignment Plan for the band to be shared between services.

## 2.3 Typical applications

According to the preamble of the NRFP, the typical applications column "*…indicates the current national usage of the frequency band in South Africa and contains allowed applications. Contains the main service, systems and application(s) of this frequency band or a part of it, authorized in South Africa. If the use covers more than one frequency band or concerns only one part of the band, the frequency range is generally indicated.*" (own emphasis). "Allowed" in this context is assumed to mean licenced or assigned.

From the above, only current systems must be reflected in this column. Therefore, potential future use of a band cannot be added to this column. Once such new service/application is introduced in the band (or "allowed as per the above"), through the required mechanisms as discussed above, such application could be added to column 3. Where the Authority wants to indicate a future use, an appropriate note can be added to the "Notes and Comments" column. For example, the future use of a band for BSS feeder links is not a typical application (no such deployments at this stage)

and should therefore not be reflected in column 3 of the NRFP. Telkom recommends that the Authority review all entries in the "Typical applications" column and remove all that are not current or allowed.

### 2.4 Alignment of ITU versus SA allocations

In general, the frequency bands for columns 1 and 2 ("ITU allocations" and "South African Allocations" respectively) should align in terms of allocations to radiocommunication services as well as frequency ranges. The general approach is for spectrum ranges to align between these two columns. In the draft Plan, the Authority split the SA allocations in many cases to reflect specific South African allocations. Whereas this is acceptable and necessary in, for example, cases where there are specific or alternative allocations for South Africa (e.g. the band 11650-12050 kHz to reflect an alternative broadcasting allocation in South Africa in a sub-band), the draft Plan contains several bands where the alignment has been removed by splitting the South African allocations into smaller sub-bands to reflect minor uses such as radio astronomy or other science services.

Telkom advises against the splitting of SA bands as it makes the NRFP unnecessary complex through repetition and introduces several errors in the "SA Allocations and footnotes", "Typical applications" and "Notes and Comments" columns, as is evident in the draft Plan. Also, the information pertaining to the specific services, which the Authority is trying to reflect through a split in the band, are contained in ITU footnotes, which are included in the table (e.g. 5.286 specifies the frequency limitations for the space research and space operation services and this sub-band doesn't have to be reflected through a complex split in the allocations table).

The appropriate way to reflect these services in the table is through a simple addition of the relevant frequency band after the service or application entry, as is done for many other services and applications. An example in the NRFP, 2018 where this was done is within the band 4800-4990 MHz, where the radio astronomy allocation was added to the "SA allocations and footnotes" column whereas the frequency restrictions of this service is indicted in the "Typical applications" column (i.e. "*Radio astronomy on 4825 – 4835 MHz and 4950 – 4990 MHz*"). With such a reference to the applicable frequency band/s, there is no need to split the table in multiple sub-bands and duplicating the information of these bands in each such-band.

If the Authority decides to keep the proposed band splits as per the draft Plan, the Authority will have to thoroughly review all these cases to ensure that the services, footnotes, applications, and notes are correctly reflected. If this is not done, it will create a lot of ambiguity and inaccuracy in the table.

### 2.5 Radio Frequency Spectrum Migration Plan

According to the Electronic Communication Act, Act No.36 of 2015 (ECA) as amended, the "national radio frequency plan" includes, but is not limited to, the table of frequency allocations and a radio frequency migration plan. The radio frequency migration plan is therefore an integral part of the NRFP. Ideally, the draft migration plan should be published with the draft Plan to ensure alignment between new allocations, future use of bands and possible migrations of incumbent services. Since the draft migration plan is not yet available, the introduction of new allocations into the NRFP does not necessarily reflect agreement that incumbent services will be migrated from these bands.

Many of the frequency band changes based on the outcome of WRC-19 may result in some frequency migrations to occur. For example, the 26 GHz band is now identified for IMT services; however, this band is used extensively for PTP links and PTMP systems by various licensees. To introduce IMT services in the 26 GHz band, some PTP links may have to be migrated. The migration of incumbent services will depend on the consultations as part of the development of the updated radio frequency migration plan. The 38/40 GHz example of use between IMT, fixed and satellite was also expressed above.

It is not clear when the Authority will update the current 2019 Radio Frequency Migration Plan to address possible migrations stemming from this draft Plan. Whereas Telkom can generally accept the proposed amendments to the NRFP based on the changes from WRC-19, it must be clear that the implementation of such band usage changes nationally is not automatic and still need its own processes including development of migration plans and possibly radio frequency spectrum assignment plans, amongst others, before such new allocations can be implemented.

### 2.6 Frequency bands used for Maritime services

According to section 2.3.6 of the draft Plan, a list of frequency bands used for Maritime services are contained in section 7 of the NRFP. However, the list of Maritime services is contained in section 8 of the draft Plan ("LIST OF FREQUENCY BANDS USED FOR MARITIME SERVICES"). Telkom recommends that section 2.3.6 be amended to reflect this error.

Several references to section 7 for maritime services in the frequency bands below 30 MHz are contained in the draft Plan. As per the above, Telkom recommends that these references be amended to refer to section 8.

In addition, it is noted that section 8 and the table of allocations are not fully aligned as pertaining to the use of frequencies for maritime services. Telkom recommends that the table of allocations be aligned with the frequency information as contained in section 8 of the draft Plan.

The frequency range 22 000 – 22 855 kHz, and the listed frequencies (22009 kHz, 22015 kHz, 22060 kHz, 22705 kHz, 22711 kHz and 22756 kHz) should be deleted from the table in section 8 of the draft Plan as these are not used by Telkom's maritime services.

### 2.7 Updating of the Radio Frequency Spectrum Regulations, Annexure B

Annexure B of the Radio Frequency Spectrum Regulations, 2015 ("RFSR") contains a list of apparatus which are exempted from the requirement to have a radio frequency spectrum license to use radio frequency spectrum. The Authority published a draft amendment to Annexure B of the RFSR on 23 July 2019 (Government Gazette 42590, Notice 1003 of 2019). The amendment of Annexure B of the RFSRs process was however never concluded (no final was published to our records).

It is not clear why this process was not concluded and is now long overdue. Since the previous consultation was published more than two years ago, Telkom recommends that a new consultation process be followed to obtain the latest views on spectrum license exempted use before Annexure B is updated.

### 2.8 General matters

#### 2.8.1 References to ITU Resolutions and other relevant documents

Several ITU Resolutions have been updated at WRC-19, which updates are not reflected in the draft Table. Telkom recommends that these updates be done throughput the NRFP.

Further, it is noted that in some bands, references to applicable ITU Resolutions are added whereas this is not done consistently throughout the draft Plan. Telkom recommends that all references to applicable ITU Resolutions be added throughout the NRFP to assist in managing the spectrum and for consistency.

References to national documents, for example the IMT Roadmap, is not applied consistently throughput the draft Plan. In some IMT bands, a reference is added whereas this is not done in other IMT bands where the IMT Roadmap equally applies. Telkom recommends that these references be applied consistently throughout the NRFP.

### 2.8.2 Duplications

In many frequency bands, especially the IMT frequency bands, there are duplications in the "Typical Applications" and "Notes and Comments" columns. For example, the specific IMT bands are listed (e.g. IMT1800) and then the band is also indicated as "International Mobile Telecommunications (IMT)". In some bands, references to Resolutions have also been duplicated. To simplify the table and remove possible misinterpretations and errors, Telkom recommends that all duplications be removed throughout the NRFP.

### 2.8.3 Alignment of entries in the table

Telkom recommends that the entries in the NRFP be horizontally aligned between columns (i.e. entered on the same line) where such entries relates to the same application of service to avoid confusion, ambiguity, or possible misinterpretation. For example, where an entry in the "Notes and Comments" column is directly associated with an entry under "Typical Applications", these entries should appear in the same line. For example, in the band 890-942 MHz, it seems that the band 915-921 MHz is paired with the band 876-880 MHz and the band 921-925 MHz paired with the band 880-915 MHz while these pairings are the opposite. Alternatively, all entries should be clearly qualified to ensure that there is no ambiguity. For example, band 880-915 MHz should rather be indicated as "IMT900 MTX (880 – 915 MHz)", which will make it clear that the sub-band is to be used for IMT 900 MHz mobile transmissions.

### 2.8.4 Consistency

The Authority is requested to apply references and comments consistently throughout the NRFP. In many cases, references to the same document, conditions of use (e.g. reference to Resolution or power restrictions), pairing of frequency bands, etc. are provided using different language. These inconsistencies create confusion and, in some cases, will lead to misinterpretation of the use of frequencies in the NRFP.

### 2.8.5 Acronyms

- GPRS: Telkom proposes deletion of this acronym as it is not used within the draft Plan.
- GSM 900: Telkom proposes deletion of this acronym as it is not used within the draft Plan.

- Ka-Band: Telkom proposes deletion of this acronym as it is not used within the draft Plan, and since it differs from the definition provided in table 2 of the draft Plan.
- L-Band: Telkom proposes deletion of this acronym as it is not used within the draft Plan. The term is also differently defined in Table 2 of the draft Plan.
- LF: Telkom proposes deletion of this acronym as it is not used anywhere within the draft Plan.

# 3. Band Specific Comments

## 3.1 Frequency range 450 – 470 MHz

The Authority prescribed a Radio Frequency Spectrum Assignment Plan ("**RFSAP**") for the frequency band 450 – 470 MHz ("**IMT450**") in Government Gazette 38640 dated 30 March 2015 (Notice 270 of 2015). The IMT450 channel arrangements are based on ITU-R Recommendation M.1036-4. Ten (10) channel options were provided in Recommendation M.1036-4, which are also reflected in the IMT450 RFSAP. Bands D2, D3, D4 or D5 were identified as options for South Africa (each providing 2x5 MHz for IMT). Only one option can be accommodated in the 450 MHz band.

Recommendation M.1036 has been updated in 2019; the current version being M.1036-6. In this version, all but option D8 (20 MHz TDD) as contained in M.1036-4 have been removed. In the latest version, three (3) new band options have been added namely D12, D13 and D14.

Telkom recommends that the IMT450 RFSAP be updated, through public consultation, to reflect the new band options as per Recommendation M.1036-6, which will ensure that South Africa align with future developments in the IMT450 band. It is important that South Africa decide on the best band option for the IMT450 band, based on M.1036-6, and the development in IMT ecosystems. Once this is done, the implementation of the band, including migration of existing users where required, based on the band option selected, could be implemented. The need to update the IMT450 RFSAP is also reflected in the 2019 Radio Frequency Migration Plan (see section 4.10.14), although this still refers to M.1036-5, which was the updated recommendation at the time. The Authority does refer to M.1036-6 in the draft Plan and the IMT450 RFSAP must therefore be aligned with the latest version of recommendation.

Telkom recommends that the Authority starts the process to update the IMT450 RFSAP, before frequency migration of incumbent services can start, followed by licencing of the band for IMT services.

The draft Plan contains references to the IMT450 RFSAP in the bands 459-470 MHz. This reference must be added to all the sub-bands form 450-470 MHz. Further, a reference to the International Mobile Telecommunication Roadmap has been added only to the sub-band 460-470 MHz; this reference must be added to the entire IMT450 band (i.e. 450-470 MHz).

Telkom also recommends the removal of the band split within the frequency range 450-455 MHz (see section 2.4 above).

### 3.2 Frequency range 470-694 MHz

As discussed in section 2.1 above, Telkom does not support the splitting of the band 470-694 MHz into three sub-bands (i.e. 470-606 MHz; 606-614 MHz; and 614-694 MHz), only to indicate a secondary radio astronomy allocation in the band 606-614 MHz. The allocation to radio astronomy can be captured in the table with a reference to the associated frequency band without splitting the band, as per the 2018 NRFP. This split not only introduces unnecessary complexity and duplication in the table but has also erroneously resulted in the omission of BROADCASTING in the sub-band 614-694 MHz. Therefore, Telkom recommends removing the band split and keep the NRFP as per the 2018 version with a single band 470-694 MHz.

The band 470-694 MHz is used for Television Whitespace technologies. The reference in the table however indicates that "*The use of 'White Spaces' in this band is under consideration…*" (own emphasis). Telkom recommends that the NRFP be updated to reflect the status of use of white spaces in this band.

### 3.3 Frequency range 694-862 MHz

The Authority deleted the "BROADCASTING" allocation from column 2 ("South African allocations and footnotes") of the draft Plan in the frequency bands 694-790 MHz and 790-862 MHz. These two frequency bands have been earmarked for mobile services and will be licensed for mobile use in the upcoming auction. The completion of the migration of broadcasting services out of these bands (switch-off of analogue systems and removal of digital multiplexers from the band) are critical for South Africa to allow its use for mobile services.

The previous Minister of DCDT indicated that all analogue broadcasting systems within the IMT700 and IMT800 frequency bands will be migrated from these bands no later than 31 May 2022. According to the new Minister, the indicated is that migration will be completed even earlier. Since the broadcasting systems are being migrated and since existing broadcasting licences relating to these two frequency bands will not be renewed when it expires, Telkom supports the deletion of the broadcasting allocation from these two bands.

### 3.4 Frequency range 790-942 MHz

The band 856 – 864.1 MHz, paired with the band 868.1 – 876 MHz, is indicated as available for fixed links. Not only are the paired bands asymmetrical (i.e. 8.1 MHz versus 7.9 MHz), it is of very limited bandwidth for fixed links, so its purpose is not clear. Also, part of the band 856 – 864.1 MHz overlaps with the IMT800 band (832 – 862 MHz) whereas the band 868.1 – 876 MHz partially

overlaps the IMT850 band (870 – 875 MHz). Sharing between mobile systems namely IMT800 and IMT850 systems and fixed links in the same area will not be feasible. Telkom therefore recommends that the band 856 – 864.1 MHz, paired with the band 868.1 – 876 MHz, for fixed links be deleted from the table. Telkom therefore also recommends that the allocation of the band to FIXED services in column 2 of the draft Plan be deleted.

The band 827.775 – 832.695 MHz, paired with 827.775 – 832.695 MHz, is indicated for wireless access systems. This band is generally referred to as the 850 MHz mobile band used for CDMA-2000 technologies. The Authority in 2019 prescribed a new IMT850 RFSAP for the bands 825-830 MHz paired with 870-875 MHz, which Telkom understand to have replaced the previous band arrangement. Telkom recommends that a reference to the IMT850 RFSAP be added to the NRFP. Telkom also recommends that the reference to the band 827.775 – 832.695 MHz, paired with 827.775 – 832.695 MHz be deleted from the NRFP.

GSM-R is indicated in “Typical Applications” column as having access to 877.695 - 880 MHz paired with 921 – 925 MHz band. This is then contradicted by National Footnote NF10, which state 876-880 paired with 921-925 MHz. A paring of 921-925 MHz does however also appear further down in the draft Plan, which seems to be paired with 921-925 MHz. Telkom recommends that the Authority provides clarity for the GSM-R application so that consistency be achieved throughout the NRFP.

Duplications in entries must also be deleted to avoid possible confusion in interpretation in the use of the band. This also supports Telkom’s view as to why associated entries should be aligned in the table.

Furthermore, the use of a different wording in Typical Applications for GSM-R (“GSM-R (BTX) (921 - 925 MHz)” versus "921-925 MHz GSM-R”) is not only unnecessary duplication but may also cause ambiguity. Telkom’s view is that it would be helpful to rather use consistent wording throughout the NRFP and to avoid duplications (see also section 2.8.3).

The entry 915-921 MHz seems to be unrelated to any other pairing or entry in the table and its purpose of use is not clear. Telkom recommends that this entry be further clarified or deleted.

In the band 890-942 MHz, reference to NF11 is made in the “South African allocations and footnotes” column. However, in section 6, NF11 is suppressed. Telkom recommends that the reference to NF11 in the table be deleted.

### 3.5 Frequency range 960-1300 MHz

The band 960 – 1164 MHz has been split into three sub-bands to accommodate an additional South African allocation for “AERONAUTICAL MOBILE SATELLITE” in the band 1087.7 – 1093.3 MHz. As per our comments in section 2.4 above, Telkom does not support this. It is suggested that this split be removed and to simply add the new service to the SA column accompanied by the specific frequency band that applies.

Similarly, the band 1240 – 1300 MHz have been split into three sub-bands, which Telkom recommends be deleted.

### 3.6 Frequency range 1350-1518 MHz

As also argued above, Telkom does not support the split in the band 1350 – 1400 MHz, seemingly to add the use of radio astronomy in the band 1330-1400 MHz (as per 5.149). The use of radio astronomy in the band could be added simply by adding the relevant frequency band to the service i.e. “radio astronomy (1330-1400 MHz)”. Also, by splitting the band, the sub-band 1370-1400 MHz is now undefined in the table (i.e. no SA allocations for this band in column 2).

ITU-R Footnote 5.338 is not relevant to South Africa. According to Article 5 of the ITU-R Radio Regulations, this footnote is relevant only to Kyrgyzstan, Slovakia and Turkmenistan and Telkom therefore recommends that this footnote be removed from Column 2 of the draft Plan as it is irrelevant to South Africa.

Telkom agrees with the IMT identification for the band 1427 – 1518 MHz. However, there is a need for the development of a Radio Frequency Spectrum Assignment Plan for this band to deal with the migration of current fixed services, sharing with broadcasting services (although Telkom recommends that the band be allocated exclusively for IMT) and the assignment methodology to be used for the IMT band, which is presumed to be through a competitive process such as an auction. It is also important that industry comment on the band plan options (i.e. Time Division Duplex (TDD) or Supplementary Downlink (SDL)) when the assignment plan is drafted.

The title of Resolution 761 (Rev. WRC-19) is “*Coexistence of International Mobile Telecommunications and the broadcasting-satellite service (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3*”. The call for compatibility studies, as reflected in the draft Plan, is not from Resolution 761 but from Resolution 223 (Rev. WRC-19), although not clear. Telkom recommends that the text associated with Resolution 761 in the draft Plan be redrafted. The text

associated with Resolution 761, as reflected in the sub-band 1492-1518 MHz, is accurate and sufficient and should be used also in sub-band 1452-1492 MHz.

In addition to the listed Resolutions, others also apply namely Resolution 528 (Rev. WRC-19) and Resolution 739 (Rev. WRC-19). Telkom recommends that references to these Resolutions also be listed.

The Authority added a reference to the Digital Sound Broadcasting (DSB) Regulations for the sub-band 1452-1492 MHz. Although this Regulation deals with DSB and the band can also be used for DSB, the DSB Regulation is not relevant in this frequency band (it relates only to the bands 535.5 - 1606.5 kHz, 87.5 - 108 MHz and 214 - 240 MHz). Telkom therefore recommends that this reference be deleted.

Telkom is further of the view that DSB will not be licensed in this band in SA and that the band will be made available exclusively for IMT services in the future as per the 5G report sent to the Minister in 2020. Telkom therefore recommends that the typical application for DSB be removed as the band is neither currently used for DSB nor will it be used for DSB in future.

ITU-R Footnotes 5.341B and 5.341C are only applicable to Regions 2 and 3 respectively, and thus do not apply to South Africa and should be deleted from column 2 (“SA allocations and footnotes”).

In the band 1452-1492 MHz, reference to NF12 is made in the “South African allocations and footnotes” column. However, in section 6, NF12 is suppressed. Telkom recommends that the reference to NF11 in the table be deleted.

### 3.7 Frequency range 1710-1930 MHz

Telkom does not support the splitting of the SA allocations as proposed (see section 2.4 above). This splitting of the table seems to be only for the introduction of radio astronomy in the band 1718.8-1722.2 MHz (according to 5.385 and 5.149). Although Telkom supports the allocation to radio astronomy in the band, there is no need to split the frequency band to reflect this. Rather than splitting the SA Table of allocations, which introduces complexity and errors, the astronomy band can be reflected with the associated frequency band i.e. “Radio astronomy (1718.8-1722.2 MHz)”). This could also be added to the “Typical Applications” column as with other applications reflecting the astronomy application relevant to this frequency band. This will make it clear that astronomy applies only to the 1718.8-1722.2 MHz band. Splitting the band introduced many errors in the draft Plan. For example, many of the applications listed in the sub-band 1710-1718.8 MHz are not applicable to this sub-band and must be deleted.

NF8 has been added to the sub-band 1710-1718.8 MHz; however, this footnote deals with the band 430-440 MHz band. This reference should therefore be deleted.

It is recommended that the Authority inserts the word “DECT” in front of Cordless telephones within the 1880-1900 MHz band.

The IMT1900 TDD band (1900 – 1920 MHz) may cause interference to IMT2100 systems deployed in the adjacent band (i.e. 1920-1980 MHz). Telkom therefore recommends that a Radio Frequency Spectrum Assignment Plan (RFSAP) be developed to address compatibility between TDD IMT in the band 1900-1920 MHz with FDD IMT systems deployed in the IMT2100 band. Amongst others, guard-bands and co-ordination triggers will be required.

### 3.8 Frequency range 1885 - 2200 MHz

The frequency bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz may be used for High Altitude Platform Stations (HAPS) as per 5.388A. However, these are not typical applications at this stage. Telkom recommends that the reference to HAPS be added under the “Notes and Comments” column (see also section 2.3 above). Also, Telkom recommends that a reference to Resolution 221 (Rev. WRC-07) be added to the NRFP. These references should be added to all the relevant bands as per 5.388A.

### 3.9 Frequency range 2300-2450 MHz

As indicated in other bands, Telkom does not support splitting the band 2300-2450 MHz into two sub-bands for the South African allocations, namely the bands 2300-2400 MHz and 2400-2450 MHz only to reflect the use of the band 2400-2450 MHz for amateur satellite services on a secondary basis.

The reference to the bands 2307-2387 MHz paired with 2401-2481 MHz for FWA (PTP/PTMP) can be deleted from the NRFP. This FDD frequency arrangement was used by Telkom for the deployment of a PTMP/TDMA network since the early 1990’s but these systems have now been refarmed to IMT. All PTMP/TDMA systems and customers have been migrated to the IMT2300 band or alternative systems/frequency bands.

Telkom also recommends that the entry pertaining to the use of the listed channels for outside broadcasting (OB) links be deleted. This band is no longer used for OB links (no requests for coordination has been received for many years). This may be attributed to the use of alternative bands for OB links, for example the use of the 1518 – 1525 MHz as indicated in the 2019 Migration Plan, the 2 GHz band (i.e. 2025-2110 MHz paired with 2200-2285 MHz) or alternative technologies

such as satellite and fibre. The implication of the cessation of requests for coordination is that the OBs no longer use this band. The final Radio Frequency Migration Plan, 2019 (Government Gazette 42337, Notice 166 of 2019) also stipulates that OB links operating in the 2400 MHz band should be migrated to the band 1518 – 1525 MHz. The references to OB links in this band could therefore be deleted.

### 3.10 Frequency range 2450-2483.5 MHz

The “Typical Applications” column is incomplete. The list of applications operating in accordance with the Radio Frequency Spectrum Regulations on a licence exempted basis should be the same as in the previous band (i.e. 2400-2450 MHz). All applications namely Wireless Local Area Network (WLAN); FDDA and Model Control; Non-Specific SRDs and low power video surveillance; RFID and ISM should be added to the band 2450 – 2483.5 MHz.

### 3.11 Frequency range 2483.5-2500 MHz

The reference to “*SRD applications (2400-2483.5 MHz)*” under “Typical Applications” is incorrect as this reference does not apply to the band 2483.5-2500 MHz. Although ITU-R Recommendation SM.1896 list the 2400-2500 MHz as a typical band for SRDs, it is also noted in the Recommendation that the upper limit for SRDs in some countries are 2483.5 MHz. Also, the Radio Frequency Spectrum Regulations, Annexure B, does not list any SRDs in the band 2483.5 MHz to 2500 MHz for South Africa. Telkom therefore recommend that the reference to SRDs in this band be deleted.

Further, the reference to ITU-R Recommendation M.1896 listed in the band 2483.5-2500 MHz should be added to all applicable bands (i.e. 2400-2483.5 MHz).

### 3.12 Frequency range 2500-2690 MHz

#### 3.12.1 FIXED (tropospheric scatter systems)

It is not clear to Telkom why “FIXED” is introduced back into the South African allocations since the band is designated for IMT applications (i.e. IMT2600). This Fixed allocation, read with 5.410, is for use of tropospheric scatter systems. Telkom is of the view that this is not to be used in South Africa due to concerns regarding harmful interference with the IMT systems to be deployed in the band. We are also not aware of any use of these tropospheric scatter systems in this band. Thus, we propose removal of the “FIXED” allocation from the “South African allocations” column. This applies to the frequency range 2500-2690 MHz.

### 3.12.2 IMT2600 band plan arrangement

The Authority changed the channelling plan of the 2600 MHz band from an FDD/TDD arrangement to an all TDD arrangement when it prescribed the updated IMT2600 Radio Frequency Spectrum Assignment Plan on 22 May 2020 (Government Gazette 43341, Notice 285 of 2020). This assignment plan came into effect on the date of publication.

It is not clear why the draft Plan still refers also to the previous FDD/TDD channelling arrangement. Although the new all TDD plan was added to the table and reference is made to the new TDD RFSAP, references to the previous assignment plan and the use of the band for FDD/TDD was retained. Telkom recommends that the necessary changes be made to the NRFP to reflect the use of the all TDD assignment plan for this band. This is also aligned with the proposed licensing of this band through the upcoming auction.

The reference to the new assignment plan should also be added to the sub-band 2670-2690 MHz ("Notes and Comments" column). Reference to "IMT (2500-2690 MHz)" must also be added to column 3 ("Typical applications").

### 3.12.3 Broadcasting satellite services

It is not clear to Telkom why "BROADCASTING SATELLITE" is introduced back into the South African allocations as the band has been earmarked for IMT services (including in the planned auction) and sharing between IMT systems and broadcasting satellite systems in the same area on the same frequencies is not possible. Furthermore, the use of this band for broadcasting satellite is limited to national and regional systems for community reception; Telkom is not aware of such satellite systems that has been launched for the national or regional market.

Telkom therefore proposes removal of the "BROADCASTING SATELLITE" allocation from the "South African allocations" column. This applies for the frequency range 2520-2670 MHz.

### 3.12.4 Splitting the frequency band 2520-2665 MHz

As argued above, Telkom doesn't support the splitting of this frequency band. The split of this band is to accommodate earth exploration-satellite (passive) and space research (passive) services, both on a secondary basis and operating within the band 2 640-2 655 MHz, as per 5.339. Both these services can be accommodated in the table by just adding the frequency band limits next to each service, without the need to split the band.

### 3.13 Frequency range 3300-3400 MHz

Telkom agrees with the identification of the band for IMT and indicting that this is pending the completion of sharing studies and the migration of incumbent radars from the band. The current typical application in the band is radars, which could be reflected as such.

As indicated in section 2.1 above, this is an IMT band and it should be treated as high demand spectrum. As such, the Authority should develop a Radio Frequency Spectrum Assignment Plan for the band to address, amongst others, all sharing issues and assignment methodology, amongst others.

### 3.14 Frequency range 3400-3600 MHz

Telkom is very concerned that the “FIXED-SATELLITE” allocation is re-introduced into the South African allocations in the band 3400-3600 MHz in the draft Plan. The band 3400-3600 MHz have been allocated exclusively for FWA and later for mobile services, while fixed-satellite services were specifically prohibited from using this part of the C-Band, for many years.

Sharing between mobile IMT systems and satellite earth station receivers are not feasible on the same frequencies and within the same area on a co-primary basis, as was also evident from the recent harmful interference experienced in the 3.7 GHz band. This band is also part of the spectrum to be auctioned for IMT services in the upcoming auction; the spectrum will, through the auction, be licensed on a national and exclusive basis to IMT services. If satellite earth stations are allowed back into this part of the C-Band, it will negatively impact the value of the spectrum as there is no information as to how many C-Band earth station receivers are or will be deployed in this band on a co-primary basis. This will negatively impact the auction process as information on the shared use of the band between IMT and satellite earth station receivers will have to be obtained and be assessed before the start of the auction.

Based on the above, the allocation to satellite services must be deleted from the “South African allocations” column.

### 3.15 Frequency range 3600-3800 MHz

The Authority’s 5G report sent to the Minister in 2020 indicates that the 3.7 GHz band (3.6 – 3.8 GHz) is part of a second wave of 5G frequency bands to be licensed. To the surprise of industry, this band was licenced to SMMEs through a closed process and in contravention of the Authority’s own Radio Frequency Spectrum Regulations (demand clearly exceeded supply). This band is also on the agenda of WRC-23, where the secondary mobile allocation is being considered for an

upgrade to a primary allocation (no IMT identification being considered). Based on the 5G Report to the Minister, it seems that the Authority is planning to earmark this band for IMT services in future.

This band is used for primary services including fixed links and satellite earth station receivers, both which much be protected. However, there are no information as to how these secondary users will use the band and ensure that the primary users are protected when systems and services are deployed. To proactively avoid harmful interference to the primary services, it is critical that the necessary processes are in place to ensure the necessary coordination to take place. Telkom's comments in section 2.2 also refers in terms of this band.

### 3.16 Frequency range 4500-4800 MHz

IMT should be removed from this band, since IMT applies only to the band 4800 – 4990 MHz.

### 3.17 Frequency range 4800-4990 MHz

As indicated in section 2.1 above, this is an IMT band and it should be treated as high demand spectrum. As such, the Authority should develop a Radio Frequency Spectrum Assignment Plan for the band to address, amongst others, all sharing issues, which will include sharing of IMT with, or migration of, ENG/OB. Issues such as assignment methodology should also be addressed in the assignment plan.

The SA allocations for this band was split to introduce radio astronomy in the bands 4825 – 4835 MHz and 4950 – 4990 MHz and earth exploration-satellite (passive) in the band 4 950-4 990 MHz. Telkom's comments in section 2.1 above regarding the splitting of bands refers. With this splitting of the band, IMT was omitted from the sub-band 4800-4825 MHz.

According to NF15, the band 4400 – 5000 MHz is allocated to electronic news gathering (ENG) and outside broadcasting (OB) services under the mobile and fixed services respectively and is shared with Government Services. With the splitting of the band, ENG and OB were not included in the sub-bands 4825-4990 MHz. It is not clear if this was intentional or an omission. Telkom recommends that this be confirmed. NF15 was added to all sub-bands except 4950-4990 MHz.

### 3.18 Frequency range 5150-5350 MHz

WAS/RLAN is indicated as a typical application in the band 5150-5350 MHz. However, the entries are not consistent in the different sub-bands. Whereas the sub-band 5150-5216 MHz just indicates "WAS/RLAN", the sub-band 5216-5250 MHz also added the phrase "(indoor use only – ITU Res229

WRC-19)", the sub-band 5250-5255 MHz contains the phrase "(indoor use only)" while the sub-band 5255-5350 MHz contains the phrase "(Power limitation ITU Resolution 229 WRC-19))". The vastly different conditions in the way the band is used for WAS/RLAN creates confusion and will result in harmful interference between the services using the band if implemented as indicated in the draft Plan.

Firstly, the conditions associated with the use of the sub-band 5150-5250 MHz differs from the use of the sub-band 5250-5350 MHz. These differences are contained in Resolution 229 (Rev. WRC-19). Secondly, whereas the draft Plan indicates in the sub-band 5255-5350 MHz that power limitations apply, power restrictions apply in all the bands. The different power and other use restrictions that apply in the different bands are contained in the resolves part of Resolution 229 (Rev. WRC-19).

WRC-19 made certain changes to the use of these bands for indoor and limited outdoor use, which could be allowed under very specific conditions. The obligation to ensure compliance to the flexibility allowed in these bands resides with the Authority. It is not clear if and to what extent the Authority will allow limited outdoor use in these band, based on the information in the draft Plan.

Telkom recommends that the Radio Frequency Spectrum Regulations (Annexure B) be updated urgently to address the implementation of the revised Resolution 229 (Rev. WRC-19) and to ensure compliance with the use of this band. Telkom also recommends that a note to be added to the NRFP to indicate that outdoor use of the band will only be considered based on the outcome of the updated Radio Frequency Spectrum Regulations, Annexure B. This will ensure a smooth introduction of the new provisions and use associated with Resolution 229.

Similar to the band 5150-5350 MHz, differences in the notes in the different sub-bands for the band 5470-5725 MHz also appear in the draft Plan. In the sub-band 5670-5725 MHz, it is indicated that WAS/RLAN is restricted to indoor use; this is not aligned with Resolution 229 and Telkom recommends that this be corrected. Telkom also recommends that all differences in text in the various sub-bands in the frequency range 5150-5725 MHz pertaining to WAS/RLAN use be addressed.

### 3.19 Frequency range 5925-6700 MHz

The Authority split the band 5925-6700 MHz into sub-bands 5925-6425 MHz, 6425-6429 MHz and 6429-6700 MHz, seemingly to distinguish between the lower 6 GHz and upper 6 GHz PTP bands and the use of C-Band satellite uplinks, the latter limited to the band 5850-6429 MHz. This split

does however introduce several errors in the “typical applications” (Colum 3) and the “Notes and Comments” (column 4), which errors must be corrected.

All references to Upper 6 GHz PTP in the sub-band 5925-6425 MHz should be deleted (columns 3 and 4). Similarly, the reference to Resolution 150 does not apply to the sub-band 5925-6425 MHz and should be deleted for column 4. Telkom recommends that a reference to Resolution 902 (WRC-03) be added to the sub-band 5925-6425 MHz as it relates to the implementation of ESVs in this band.

In the sub-band 6425-6429 MHz, the references to ESVs must be deleted as these apply only to the lower 6 GHz band (i.e. 5925-6425 MHz). Also, the footnote 5.457A does not apply to this band and must be deleted from column 2.

Since the VSAT uplinks are limited to the band 5925-6429 MHz (reference to VSAT applications removed from the band 6429-6700 MHz in the draft Plan), Telkom recommends that the fixed-satellite allocation in column 2 in the draft Plan also be deleted (from the frequency range 6425-6700 MHz). This band is not used for VSAT applications in South Africa and is used extensively for PTP links mainly for backhaul links for mobile networks. Also, in future the band 6425-7125 MHz may be used for IMT applications as it is being considered for IMT under WRC-23 agenda item 1.2. In section 6, NF14, it is indicated that the band is shared with FSS; Telkom recommends that this note also be deleted.

Footnote 5.457B does not apply to South Africa and should be deleted from the SA allocations column.

### 3.20 Frequency range 6700-7145 MHz

In addition to fixed links (Upper 6 GHz), the band 6700-7075 MHz is also used for S-DAB (Satellite digital audio broadcasting) according to the draft Plan. This application is however no longer being used in South Africa and there are no prospects that such need will be required in the near future. Therefore, Telkom recommends that the reference to S-DAB as a typical application be deleted from the draft Plan.

Similarly, the note “*Feeder links of non-GSO-satellite systems in the MSS*” can also be deleted from the draft Plan. There is no indication that this band will be used for FSS under Appendix 30B in the near future also considering the restrictive use of this band under Appendix 30B. Telkom is not aware of any frequency coordination between fixed links and satellite earth stations or any instances of harmful interference reported within this band. With no fixed satellite (Earth-to-space)

use of the band 6700-7075 MHz now or planned for the near future, Telkom recommends that references to feeder links be deleted from column 3 (Typical Applications). These applications, if deployed in future, can be reflected as typical applications in the NRFP.

The entry “Fixed links – Upper 6 GHz (6425-7110 MHz)” in column 3 is a duplication and must be deleted.

The entry in the sub-band 7075-7145 MHz “*Fixed links - Upper 6 GHz (6425-7110 MHz) and Lower 7 GHz (7110-7425 MHz)*” is a duplication and should be deleted.

### 3.21 Frequency range 7190-7250 MHz

“Tracking, telemetry and command for spacecraft operation” has been added as a typical application in the band 7190-7250 MHz. This band is also part of the lower 7 GHz band, used extensively for PTP links. Until now, Telkom has not engaged in any frequency coordination or sharing with Earth exploration-satellite (Earth-to-space) services in this band. Telkom understands that this application is the proposed new SANAS deployment planned for operation near Matjiesfontein. Information pertaining to the use of the band for tracking, telemetry and command is needed to ensure that these systems are taken into consideration when coordinating new PTP links. The necessary frequency coordination procedures should be established to facilitate this sharing and to avoid harmful interference between systems and services. Other frequency bands to be used for science purposes at this location must also be included in these procedures.

### 3.22 Frequency range 7250-7375 MHz

The Authority proposes to add the fixed-satellite (space-to-Earth) and mobile-satellite (space-to-Earth) to the band 7250-7375 MHz under the SA allocations. This band is currently used extensively for PTP links and is not shared with satellite services. Also, it is not clear if the addition of satellite services is only to make provision for a possible future use of the band for satellite services or if there are satellite systems being planned for launch and/or use over South Africa in the near future in these bands. Telkom recommends that the allocation in column 2 be deleted if there are no concrete plans to use this band for satellite services.

If the band (and the adjacent bands already allocated for satellite services) will be used for satellite services in the near future, the Authority must prepare the necessary frequency coordination procedures and supply to the current licensees the necessary information that will be required for a shared use of the band. This may also need the development of a Radio Frequency Spectrum Assignment Plan to address the shared use of the band.

### 3.23 Frequency range 7550-7750 MHz

The Authority proposes to delete the footnotes 5.461AA and 5.461AB from this band under the SA allocations. Both these footnotes are relevant and relate to the maritime-mobile satellite service, which was added to the SA allocations.

### 3.24 Frequency range 7750-8550 MHz

Within this frequency range, references to fixed link applications have been duplicated. Telkom recommends that these duplications be deleted.

### 3.25 Frequency range 8025-8400 MHz

The band 8025-8400 MHz is allocated to mobile services and footnote 5.463 applies. According to 5.463, aircraft stations are not allowed to transmit in the band 8025-8400 MHz. That means that aircraft stations may still receive in this band. The Authority introduced this allocation in the SA allocations in a very peculiar way. First, the band is allocated for mobile except aeronautical mobile and then this is countered by introducing an aeronautical mobile allocation, limited to ground to air. Telkom recommends that the ITU allocation, i.e. mobile with a reference to 5.463, will suffice and should be used within the SA allocations.

### 3.26 Frequency range 10.7-11.7 GHz

The band 10.7-11.7 GHz is used for fixed links in South Africa, as indicated in the “Notes and Comments” column. Telkom recommends that this entry be added to the Typical Applications column in all sub-bands 10.7-11.7 GHz. Example text to be added is contained in the sub-band 11.45-11.7 GHz namely “Fixed Links (11 GHz) (10.7 – 11.7 GHz)”. This proposal is in line with the practice as was done for all other fixed link bands.

Telkom further also recommends that the addition of the references to “Feeder links in the BSS” be deleted from the “Typical applications” column in all bands between 10.7-11.7 GHz as this band is not currently used for any BSS feeder links and there is no known plans for such use. Also, the note “*The band can also be used for BSS feeder links (see 5.484)*” should be amended to accurately reflect 5.484; Telkom proposes: “The use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to ~~can also be used for~~ BSS feeder links (see 5.484)”.

Telkom also recommends that satellite applications (e.g. VSAT) be added to the Typical applications in the sub-band 10.95-11.2 GHz. The recommended text is: “Ku-band downlink (VSAT/SNG)”. In the sub-band 11.45-11.7 GHz, Telkom recommends that the reference to BSS

feeder links be deleted as this not a typical application, as indicated above. The proposed amendment is: "*Ku-band downlink (VSAT/SNG~~/BSS feeder links~~)*".

### 3.27 Frequency range 13.75-14.5 GHz

Throughput this frequency range, there is duplication in terms of the satellite applications in the band namely; the following two entries appear: "*Ku-band uplink (VSAT/SNG/FSS feeder links)*" and "*FSS uplinks (PTP/VSAT/SNG) (13.75-14.5 GHz)*". Telkom recommends that the latter text be retained, and the former be deleted throughout this frequency range.

The frequency range 14.0-14.5 GHz is allocated to the fixed-satellite service through the following: "*FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B NF17*" that appears in column 2 of the draft Plan. However, in addition to this allocation, the text "*FIXED-SATELLITE (Earth-to-space)*" was added twice in each sub-band. This latter text is not required and should be deleted.

In the frequency band 14.0-14.5 GHz, two entries pertaining to feeder links for BSS have been added in all sub-band within the "Typical applications" column. However, these two statements are contradictory namely "*Feeder links in the BSS*" and "*Not for feeder links in the BSS*". The intention with these two contradictory statements is not clear. Based on 5.506, it is clear than the band 14-14.5 GHz can be used for BSS feeder links within the FSS (Earth-to-space) allocation. Telkom therefore recommends that the statement: "*Not for feeder links in the BSS*" be deleted.

### 3.28 Frequency range 17.7-19.7 GHz

As explained in section 2.3, BSS feeder links of GSO-satellite systems in the BSS are not typical applications (no such systems have been licensed or deployed in South Africa) and should therefore be deleted from column 3 ("Typical applications").

Footnote 5.516B does not apply to South Africa in terms of HDFSS use in the 18 GHz band and this footnote should therefore be deleted from column 2. In the 18 GHz band, the band 18.3-19.3 GHz is identified for HDFSS; however, this applies only to Region 2 (see 5.516B). The reference to Resolution 143 (WRC-19) in sub-band 18.6-18.8 GHz should therefore also be deleted as the 18 GHz band is not available for HDFSS in R1 including South Africa.

The band 18.6-18.8 GHz can also be used for fixed-satellite (space-to-Earth) and per footnote 5.522B such use is limited to GSO systems with an orbit apogee greater than 20 000 km. The Authority captured this footnote under the "Typical applications" column. Telkom recommends that

this note be deleted as the band is not used for GSO systems in South Africa at this stage and can therefore not be classified as a “typical system”.

### 3.29 Frequency range 21.2-23.6 GHz

The frequency band 21.2-23.6 GHz is used extensively by several licensees for PTP links under the fixed services. The channel plan used for the band is ITU-R Recommendation F.637, Annex 1.

The draft Plan also reflects an alternative channelling arrangement for PTP links in the 23 GHz band namely Recommendation F.637, Annex 3, applicable to the band 22.0-23.6 GHz. This alternative PTP plan was developed when the band 21.4-22 GHz was to become a primary band for BSS HDTV by 1 April 2007 and fixed services to become secondary in the band. The alternative PTP band was designed to operate adjacent to the BSS allocation. However, WRC-12 changed the use of the band by retaining the co-primary use of the band for BSS and fixed services. Footnote 5.530B encourage administrations not to deploy mobile services in 21.4-22 GHz and to limit deployment of only PTP links in the band. Telkom also recommends that NF14 be amended to reflect the use of this band for FS only (deleted references to BSS and note 5 to the table).

Since the alternative PTP channelling arrangement was never implemented and will never be used in South Africa due to the WRC-12 changes and considering the extensive use of the band for PTP links, Telkom recommends that all references to the band 22.0-23.6 GHz as well as Annex 3 (Recommendation F.637) be deleted from the draft Plan.

A note pertaining to the implementation of BSS in the band 21.4-22 GHz is contained in the “Notes and Comments” column. Telkom recommends that this note be amended as follows: “*The use of BSS in this band is subject to the provisions of ~~WRC -15~~ Resolutions 552 (Rev.WRC-19), and 553 (Rev. WRC-15) ~~and 555~~.*” Resolution 555 (Rev. WRC-15) was abrogated on 23 November 2019 (Resolution 99 (Rev. WRC-19)) and this reference should therefore be deleted.

The band 21.2-23.6 GHz is used for PTP links, as indicated in the “typical applications” column. However, this application is repeated in each sub-band through two statements namely: “*Fixed Links (23 GHz) (21.2 – 23.6 GHz)*” and “*Fixed links - 23 GHz (21.2-23.6 GHz or 22.0-23.6 GHz)*”. Telkom recommends that the latter be deleted (this also includes the reference to the band 22.0-23.6 GHz, which must also be deleted as explained above).

### 3.30 Frequency range 24.25-27.5 GHz

The band 24.25-27.5 GHz was identified for IMT use at WRC-19, which Telkom also supported. The band 24.5-26.5 GHz (26 GHz) is currently used extensively for PTP links and PTMP systems

by various licensees. Studies in preparation for WRC-19 showed that sharing between IMT and fixed links in the same area is not possible; however, with relatively small separation distances, sharing between these two services may be feasible. Sharing and coordination procedures between these two services must be further discussed and developed before the band can be made available for IMT services. Further, sharing with "*National Polar-Orbiting Operational Environment Satellite System (NPOESS)*", listed as a typical application in the band 25.5-27 GHz, must also be considered as part of the sharing and compatibility exercise.

Telkom is of the view, as explained in section 2.1 above, that all IMT bands should be considered as HDS and should therefore follow a specific process before such spectrum is licenced. To this extent, the Authority must develop a RFSAP for this band. Also, reference to NF9 should be added to the "SA Allocations and footnotes" column, next to mobile service.

Telkom also recommends that the reference to Recommendation ITU-R M.1036 be changed as follows: "*Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R".* This change must be made at all instances where this note has been added.

The band 24.5-26.5 GHz is used for PTP links, as indicated in the "typical applications" column. However, this application is repeated in each sub-band through two statements namely: "*Fixed Links (26 GHz) (24.5 – 26.5 GHz)*" and "*Fixed links - 26 GHz (24.5-26.5 GHz)*". Telkom recommends that one of these be deleted.

### 3.31 Frequency range 27.5-29.5 GHz

The band 27.5-29.5 GHz is used for various services including PTP links, fixed satellite services (Earth-to-space), LMDS[1] PTMP (base station to subscriber), as well as earth stations in motion (ESIMs) communicating with geostationary fixed-satellite service space stations. The band may also be used for mobile services as well as BSS feeder links under the FSS and NGSO feeder links.

Telkom recommends that the authority urgently develops a Radio Frequency Spectrum Assignment Plan for this band to address the sharing between the various services, operating on a co-primary basis, including the use of the band for ESIMs. These procedures will also have to include the use of the band for both specific and uncoordinated earth stations; a possible solution to the implementation of the sharing in this band is band-segmentation, as was done in Europe.

[1] LMDS is out dated; current systems are packet based wireless BFWA

### 3.32 Frequency range 37-43.5 GHz

The band 37-43.5 GHz was identified for IMT use at WRC-19, which Telkom also supported. The bands 37.0-39.5 (38 GHz) and 40.5-43.5 GHz (42 GHz) are currently used extensively for PTP links. Parts of the band 37-43.5 GHz is also planned for use for satellite (space-to-Earth) and for HAPS.

Sharing and coordination procedures between these services must be further discussed and developed before the band is made available for IMT services. Telkom is of the view, as explained in section 2.1 above, that all IMT bands should be considered as HDS and should therefore follow a specific process before such spectrum is licenced. To this extent, the Authority must develop a RFSAP for this band. Also, reference to NF9 should be added to "South African Allocations and footnotes" column, next to mobile service.

Telkom also recommends that the reference to Recommendation ITU-R M.1036 be changed as follows: "*Recommendation ITU-R M.1036-6 currently being updated and revised within the ITU-R".*

### 3.33 Frequency range 45.5-47 GHz

The band 45.5-47 GHz was identified for IMT use at WRC-19, which Telkom also supported. Telkom is of the view, as explained in section 2.1 above, that all IMT bands should be considered as HDS and should therefore follow a specific process before such spectrum is licenced. To this extent, the Authority must develop a RFSAP for this band. Also, reference to NF9 should be added to "South African Allocations and footnote" column, next to mobile service.

Resolution 244 (WRC-19) applies to this band; the reference to this resolution in the sub-band 43.5-45.5 GHz should therefore be deleted. Also, the reference to 5.553A in the sub-band 43.5-45.5 GHz should be deleted as it doesn't apply to this sub-band.

### 3.34 Frequency range 47.2-48.2 GHz

The band 47.2-48.2 GHz was identified for IMT use at WRC-19, which Telkom also supported. Telkom is of the view, as explained in section 2.1 above, that all IMT bands should be considered as HDS and should therefore follow a specific process before such spectrum is licenced. To this extent, the Authority must develop a RFSAP for this band. Also, reference to NF9 should be added to "South African Allocations and footnotes" column, next to mobile service.

### 3.35 Frequency range 57-66 GHz

This band is included in Annexure B of the Radio Frequency Spectrum Regulations, 2015 ("RFSR") as amended for use of MGWS. As per the current version of the RFSRs, fixed outdoor MGWS installations in the band 57-66 GHz are not allowed. As indicated in section 2.7 above, the Authority published a draft amendment to Annexure B of the RFSR on 23 July 2019 (Government Gazette 42590, Notice 1003 of 2019). In this amendment relating to this band, the restriction on outdoor use was removed. This process was however not concluded, and a final regulation not published. Telkom recommends that the use of this band for MGWS systems especially for outdoor use be clarified.

Telkom also recommends that reference to ITU-R Recommendation M.2003 ("*Multiple Gigabit Wireless Systems in frequencies around 60 GHz*") be added to the NRFP in the "Notes and comments" column.

### 3.36 Frequency range 66-71 GHz

The band 66-71 GHz was identified for IMT use at WRC-19, which Telkom also supported. Telkom is of the view, as explained in section 2.1 above, that all IMT bands should be considered as HDS and should therefore follow a specific process before such spectrum is licenced. To this extent, the Authority must develop a RFSAP for this band. Also, reference to NF9 should be added to "South African Allocations and footnote" column, next to mobile service.