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03 February 2017

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Via email: rmakgotlho@icasa.org.za

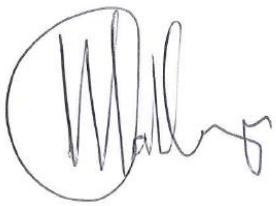
Dear Mr Makgotlho

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

Telkom SA SOC LTD ("**Telkom")** welcomes the opportunity to provide written comments on the draft updated National Radio Frequency Plan ("draft Plan"), as published in Government Gazette No. 40480 (Notice 861 of 2016) on 9 December 2016.

Please find herewith Telkom's written comments. In the event that the Authority convenes public hearings in relation to the subject matter hereof, Telkom would appreciate an opportunity to representation.

Yours Sincerely



Siyabonga Mahlangu
Group Executive: Regulatory Affairs and Government Relations

Submission to the Independent Communications Authority of South Africa

Draft National Radio Frequency Plan 2017 (NRFP-2017)

Government Gazette No. 40480 (Notice 861 of 2016) dated 9 December 2016

Telkom SA SOC Ltd

Submission date: 3 February 2017

1 Executive Summary

Telkom welcomes the opportunity to comment on the proposed updated National Radio Frequency Plan 2017 (NRFP-17). The NRFP is the most critical document in the spectrum domain and underpins the current and future use of the radio frequency spectrum, which is shared between more than 40 radiocommunication services. All decisions pertaining to the use and licensing of spectrum stems from the NRFP. It is therefore of high importance that the NRFP is robust, clear, accurate and aligned to our 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. Litigation, severe financial implications and damaging international relations could result.

The updates contained in the NRFP-17 may be categorised broadly in terms of amendments based on WRC-15 decisions and general amendments to ensure that the plan stays abreast with international and local technology and market developments. WRC-15 decisions are informed by an intense 4 your study period, which thoroughly assesses the regulatory and technical implications of a particular decision. As a result, the incorporation of these decisions in the NRFP is a relative simple task in the sense that the relevant technical and regulatory issues were thoroughly studied and considered during the WRC-15 process. On the other hand, it is much more complex to give effect to proposed NRFP amendments of a general nature, as these amendments are not necessarily supported by the requisite technical and regulatory studies. In light of this, Telkom requests that the Authority initiate further public consultation to ensure that the proposed general amendments are introduced in manner that does not compromise spectrum utilisation and licensing. This issue is addressed further in section 2.

Telkom's submission consists of two parts namely general comments (section 2) and band specific comments (section 3). A concerted effort was made to provide comprehensive inputs on all frequency bands; however this was not possible due to the stringent timelines and the volume and complexity of the document. In this regard, Telkom requests the Authority to earnestly consider publishing a second draft prior to the finalisation of the NRFP-17. The second round of consultation will allow stakeholders to place particular emphasis on certain complex issues that may have been overlooked in this first-round consultation process.

2 General Comments

2.1 Further consultation and support documentation

The National Radio Frequency Plan is a complex document addressing spectrum allocation and the shared used of the spectrum resource between various radiocommunication services and applications in South Africa. The Authority introduced many changes to the current National Radio Frequency Plan 2013 (NRFP-13) through the proposed amendments contained in the draft National Radio Frequency Plan 2017 (NRFP-17). These proposals are not limited to WRC-15 decisions but also general amendments on the use of the radio frequency spectrum. This is essential to ensure that the NRFP-17 is aligned with current and future technological developments. Certain proposed amendments to NRFP-13 are highly complex and must be preceded by inter alia, extensive consultation, debate and technical and operational clarification. Moreover, it is not possible to fully explain all technical, regulatory and operational matters associated with certain proposed amendments through a few notes in the table and/or a short footnote (FN). Providing comprehensive inputs on these amendments are therefore difficult, unless substantial additional information is made available.

A few examples of highly complex amendments that warrant further public consultation are the introduction of Fixed-satellite services (FSS) in Ka-band, BFWA in 3.6 GHz and UAVs in the 350 MHz range. In view of the lack of supporting technical information and stringent deadlines for public consultation, Telkom is unable to provide comprehensive inputs on each of these proposed changes.

The draft NRPF-17 cannot and does not capture all the issues pertaining to the shared use of the spectrum. To this extent the Authority developed, for example, Radio Frequency Spectrum Assignment Plans (RFSAPs) and Radio Frequency Migration Plan (RFMP). Rules pertaining to specific services such as those pertaining to E-Band/V-Band, are prescribed in the Radio Frequency Spectrum Regulations (RFSR). These documents provide the necessary details pertaining to the use of a particular service in a particular frequency band and were subject to extensive industry consultation. This is the

norm international with, for example Europe, providing supplementary information through ECC recommendations and reports, amongst others.

Telkom proposes that the Authority develops the necessary supplementary information (RFSR, RFMP, RFSAP, etc.) to address the complex spectrum use and sharing matters. This will allow the Authority to consult with industry on these very technical matters and ensure that the necessary technical, operational and regulatory rules are defined in an open and transparent manner. To accommodate this, Telkom recommends that the Authority add the necessary statements in the NRFP-17 to indicate where it intends to develop supporting documents.

There is a potential for misinterpreting certain proposed changes in the draft NRFP-17 ("draft Plan"). This can be attributed to misaligned entries between the various columns, duplicate entries in the draft Table which are also not aligned, unqualified information added to the table, additional information and/or changes to existing information which were not highlighted (using green, yellow or red), etc. Notwithstanding these issues, Telkom has made a concerted effort to provide comprehensive comments on the draft Plan; unfortunately the time allowed for providing written submissions proved to be insufficient, considering the size and complexity of the draft NRFP-17.

In view of the extensive amendments, complexities and possible misinterpretation of the draft NRFP-17, Telkom recommends that a final draft be published for further consultation, prior to the adoption of the NRFP-17. As a bare minimum, sections 3 (table of allocations) and 5 (National Footnotes) should be re-published for final consultation.

2.2 Alignment of entries in the table

It is important that entries in the Table be aligned between columns in order to avoid confusion, ambiguity or possible misinterpretation. Specifically, 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. Examples are:

- Where the return frequency band is indicated in the last column;
- Where a recommendation or resolution is associated with a specific service;

- Where additional information pertaining to a specific service is provided (e.g. “Government services”).

The same principle is already applied between columns 1, 2 and 3. Telkom recommends that the alignment between columns be corrected editorially before the NRFP-17 is published.

2.3 Consistency

The Authority is requested to apply references and comments consistently throughout the NRFP. For example, some frequency bands have references to an ITU Resolution/Recommendations or specific application but the same reference has not been replicated for other frequency bands to which it is applicable. This creates uncertainty and may lead to disputes when dealing with the use of spectrum, frequency coordination, etc. Telkom recommends that these changes be made editorially throughout the document before the final draft plan is published.

2.4 Radio Frequency 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. In terms of section 34(7) of the ECA, the Authority must, when preparing the NRFP, consult with the Minister on, amongst others, the plan for migration of existing users. The Authority prescribed the Radio Frequency Migration Plan (RFMP) in Government Gazette No. 36334 dated 3 April 2013.

It is not clear from the NRFP-17 how and when the Authority will deal with possible new frequency migrations, for example, planned migrations as a result of WRC-15 decisions. Since planned migrations have not been included in the draft NRFP-17 specifically, it is assume that, if any, this will be addressed later through a separate consultation process. As a minimum, Telkom recommends that the Authority capture existing migrations in the NRFP-17 through appropriate references to the RFMP.

2.5 Reference to ITU-R Recommendation M.1036

In the IMT frequency bands, the Authority added a reference to ITU-R Recommendation M.1036. In most cases, reference is also made to the RFSAP. Telkom recommends that the reference to ITU-R Rec.M.1036 be deleted from the table since a reference to both M.1036 and RFSAP could create confusion. Recommendation M.1036 is generic and refers to several channelling plan options used internationally within each IMT band while the RFSAP refers to the specific option adopted for South Africa. In any event, the RFSAP does make specific reference to ITU-R Recommendation M.1036.

In line with this proposal, Telkom recommends that the references to Recommendation M.1036 in NF9 be changed to reflect the relevant RFSAP (Government Gazette and notice number).

2.6 Duplication of entries in the draft plan

In many cases the Authority added additional information to the draft plan where such information was already reflected in NRFP-13. Adding duplicate text creates uncertainty and it is recommended that the additional text be deleted in all cases. Where the Authority wishes to add additional information, it is recommended to merge this with the existing text.

2.7 Reference to GG 38641 dated 30 March 2015 (RFSR)

Telkom recommends an editorial change to all references to GG 38641. In several places the date (year) is indicated as 20115 instead of “2015”.

2.8 Reference to CRASA documents

The Authority added several references to CRASA documents such as guidelines, frameworks, etc. Whereas these documents provide valuable information pertaining to the specific issues, especially within the SADC context, it is Telkom’s view that these documents are not legally binding and should serve as “information only”.

For example, reference is made to the CRASA harmonised frequency channelling arrangements for various frequency bands. In South Africa, channelling arrangements

have been developed and prescribed by the Authority for specific frequency bands or the relevant ITU-R Recommendations have been adopted. The CRASA documents cannot replace the South African prescribed documents. Similarly, the CRASA band plan can never replace or supplement the National Radio Frequency Plan as prescribed by the Authority.

Telkom recommends that the Authority clarify the purpose and legal status of the CRASA documents referred to in the draft plan. This should be added to section 2.1 of the draft plan (Legislative Framework). Additional comments on the CRASA documents are made in the below sections.

2.9 Reference to ITU-R Rec. SM.[SRD]

Telkom recommends that all references to ITU-R Recommendation SM.[SRD] be changed to ITU-R Recommendation SM.1896. This recommendation deals with Frequency ranges for global or regional harmonization of short-range devices (SRDs) and is assumed to be the relevant recommendation.

The use of SRDs in South Africa is prescribed in the RFSR (Annexure B). This annexure has not been updated in many years and Telkom recommends that this be done to ensure that South Africa stay aligned with international developments in the use of SRDs.

2.10 References to Resolution 75

The Authority added references to Resolution 75 in frequency bands identified for HDFS (High Density Fixed Services). However, this resolution relates only to the frequency bands 31.8-32.3 GHz and 37-38 GHz. Telkom recommends that the references to Resolution 75 be deleted from those bands where it does not apply.

2.11 References to Resolution 143

Resolution 143 specifies those frequency bands earmarked for HDFSS. Reference to this resolution has been made in some frequency bands but not in all cases. Telkom recommends that the necessary references be added where required.

2.12 Standard frequency band nomenclature (Table 2)

Telkom advises against the inclusion of this table in the band plan. These band designations are not used consistently between all industries (e.g. S-Band for radar is different than that for satellite). In addition, these frequency ranges are not consistent with what is used in the draft plan. For example, Ku-band is indicated as 12-18 GHz in Table 2 whereas it is defined in section 1.2 as "Part of the frequency band between about 11 and 14 GHz" (own emphasis). Telkom recommends that this table be deleted. If the Authority decides to keep the table, Telkom recommends that the necessary changes be made to ensure alignment with the information in the NFRP-17.

2.13 Acronyms (section 1.2 of plan)

Telkom recommends that the following acronyms be added to section 1.2 as these are used in the NRFP-17:

- ERP
- MWS

2.14 Using Microsoft Word editing mode

Telkom recommends that the Authority use Microsoft Word editing mode when preparing a draft update to the band plan. Whereas the use of the colour codes (green, yellow and red) was very helpful in identifying where changes to the NRFP-13 have been made, the colour code scheme was unfortunately not always applied. This necessitated respondents to scrutinise the entire band plan to ensure that some proposed changes have not been missed. Not only does respondents have to consider the WRC-15 Final Acts, but also have to compare the draft NRFP-17 line-by-line with the NRFP-13. Due to time constraints this was not possible so some changes will be probably be introduced in NRFP-17 without thorough public scrutiny.

2.15 Consistent use of the “Application” column

In some cases known applications are omitted and in other cases less known applications are included. A balance must be struck to include a wider range of applications. To illustrate these variances the following examples have relevance:

- An example of known applications where the draft NRFP-17 is silent includes the 94 GHz band used for FS links according to NF14 (ITU-R Rec. F.2004). Despite NF14 being included in 92-94 GHz and 94.1-95 GHz, no reference to FS links is however included.

- Another example of less known applications are found in the frequency bands above 100 GHz for use of passive sensing applications. Mostly the term “Passive sensing” is used in the “Applications” column.

3 Band Specific Comments

3.1 Frequency Range 149.9 – 150.05 MHz

149.9-150.05 MHz MOBILE-SATELLITE (Earth-to-space) 5.209	**149.9-150.05 MHz** MOBILE-SATELLITE (Earth-to-space) 5.209 NF3	Low Earth Orbit systems Mobile-satellite communications Wildlife telemetry Tracking (148 – 152 MHz)	
RADIONAVIGATION-SATELLITE 5.220	RADIONAVIGATION-SATELLITE 5.220	Single Frequency Mobile (148.950 – 151 MHz)	Radio Frequency Spectrum Regulations (Annex B) (GG. No.38641, 30 March 2015).

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 149.9 – 150.05 MHz:

- At WRC-15, the allocation to Radionavigation-satellite has been deleted from this band. Telkom recommends that that this allocation be deleted from the draft Table (columns 1 and 2).
- Telkom also recommends that FN 5.220 be moved next to the Mobile-satellite (Earth-to-space) service as per ITU Radio Regulations (should not be at the bottom of the block).

3.2 Frequency Range 335.4 – 387 MHz

335.4-387 MHz FIXED MOBILE 5.254	**335.4-387 MHz** FIXED NF6 MOBILE NF7 5.254	FWA (336 – 346 MHz) FWA (356 – 366 MHz) 366-380 MHz (Govt.) Digital Trunking (Emergency) (380 – 387 MHz) (PPDR[11]) 335.4-336 MHz PMR and/or PAMR	Paired with 356 – 366 MHz Paired with 336 – 346 MHz Paired with 390 – 397 MHz
		336-346 MHz Fixed Wireless Access 336-346 Unmanned Aerial Vehicles (UAV)	PTP/PTMP rural system; Paired with 356-366 MHz. Unmanned Aerial Vehicles (UAV) paired with 356-366 MHz.
		356.0-366.0 MHz Fixed Wireless Access	PTP/PTMP rural system; Paired with 336-346 MHz
		366.0-380.0 MHz PMR and/or PAMR	
		380.0-387.0 MHz PPDR	Paired with 390.0-397.0 MHz. To be used mainly for digital systems.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 335.4 – 387 MHz:

- The Authority added a footnote to PPDR, which footnote contains a hyperlink to a CRASA document titled “Framework for harmonisation of frequencies for Public Protection and Disaster Relief (PPDR) in SADC”. Whereas this document provides additional guidance and background on PPDR, it is out of date.
    - WRC-15 made several changes to PPDR related resolutions and these are not reflected in the CRASA document.
    - WRC-15 specifically addressed spectrum for broadband PPDR and these are not reflected in the CRASA document. In fact, the CRASA document makes reference to spectrum in the 5 GHz range (4940 – 4990 MHz), which were at the time considered for broadband PPDR. WRC-15 on the other hand decided to identify spectrum in the 700/800 MHz range for broadband PPDR.
    - Telkom recommends that the reference to the CRASA document be deleted until same has been updated based on WRC-15 decisions. If the Authority decides to keep the reference to the CRASA document, Telkom recommends that the reference be added to column 4, as was done with other references. The reference should also be clear that the CRASA document is for information only. Other references to this document, where applicable, should also be made in the NRFP-17.
- The Authority added additional references to FWA, which is a duplication of existing text. Telkom recommends that these additional references be deleted or, if the Authority wishes to supplement the existing information, to merge this with the existing text. Similarly, the use of PPDR in the band 380-387 MHz (paired with 390-397 MHz) appears twice in the table.
- The Authority added “PTP/PTMP rural system” in column 4 for the frequency band 336-346 MHz paired with 356-366 MHz. The reference to “rural” is not clear. Does the Authority intent that these systems be limited to rural areas

only? The term “rural” has also not been defined and Telkom recommends that the reference to rural be deleted. Whereas Telkom operates FWA systems in the sub-band 336-338 MHz paired with 356-358 MHz, these are not restricted to “rural” per se. Telkom recommends that the application of rural be further clarified.

- The Authority added the use of UAVs in the band 336-346 MHz paired with 356-366 MHz. Whereas Telkom is in principle not opposed to the use of this band for UAVs, we wish to highlight the following:
    - Sharing between UAVs and existing systems may be problematic and need further technical assessment to ensure that these can operate without harmful interference. Frequency sharing will depend on factors such as UAV transmitter power, area of operation, bandwidth, altitude, etc.
    - In NF6 the Authority also added a reference to UAVs. This footnote however indicates that “the band is also considered for use by UAVs including RPAS” (own emphasis). It therefore seems that the use of this band for UAVs and RPAS is still under investigation. The differences between UAVs and RPAS also need to be further considered.
    - Telkom supports further engagement on the shared use of the band prior to the introduction of UAVs in this band as a table entry.

3.3 Frequency Range 390 – 399.9 MHz

390-399.9 MHz FIXED MOBILE	**390-399.9 MHz** MOBILE NF7	Emergency) (390 – 397 MHz) (PPDR)	Paired with 380 – 387 MHz
5.254	5.254	PMR and/or PAMR (397 – 399.9 MHz) (Govt.)	Paired with 387 – 390 MHz In accordance with Resolution 646 and Recommendation ITU-R M.2015.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 390 – 399.9 MHz:

- The reference to Resolution 646 is associated with the wrong application, i.e. it does not relate to PMR and/or PAMR but with PPDR. Telkom recommends that this be verified and corrected as needed.

- The above also applies to the reference to Recommendation M.2015.

3.4 Frequency Band 450 – 470 MHz

Comments and/or recommendations pertaining to each sub-band within the range 450-470 MHz are indicated below:

450-455 MHz FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E	**450-455 MHz** FIXED MOBILE 5.286AA NF9 5.209 5.286 5.286A	Fixed links (450 – 453 MHz) Single Frequency Mobile (453 – 454 MHz) Government Services Paging (454 – 454.425 MHz) Trunked Mobile BTX (454.425 – 460 MHz) IMT450 (450 – 470 MHz) Fixed links (PTP) IMT (450-470 MHz) PMR and/or PAMR	Paired with 460 – 463 MHz Recommendation ITU-R M.1036 Paired with 464.425 – 470 MHz This band is currently used for a variety of fixed and mobile systems in the various SADC countries. This band is also identified for IMT (Res.224 applies).
455-456 MHz FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**455-456 MHz** FIXED MOBILE 5.286AA NF9 5.209 5.286A	Trunked mobile BTX (454.425 – 460 MHz) IMT450 (450 – 470 MHz) Government Services	Paired with 464.425 – 470 MHz Recommendation ITU-R M.1036

- In the frequency band 455-456 MHz, Telkom recommends that “Government services” in column 3 be linked directly to “Trunk Mobile BTX (454.425-460 MHz)”. By adding this at the end of the table, it may be interpreted that it is associated with IMT450, which is presumed not to be the case.
- In the frequency band 450-455 MHz, Telkom recommends that the return frequency “Paired with 464.425-470 MHz” in column 4 be linked directly with “Trunked Mobile BTX (454.425-460 MHz)” in column 3 in line with NRFP-13.
- As addressed in section 2.5, Telkom recommends that the reference to ITU Recommendation M.1036 be deleted, even though the IMT450 RFSAP has not yet define the specific channelling plan option that will apply in South Africa.
- The entry “Fixed links (PTP)” in column 3 is redundant as there is already a reference to fixed links.
- The entry “IMT (450-470 MHz)” is redundant as there is another reference to IMT450 (450-470 MHz).

- The reference to “PMR and/or PAMR” in column 3 is not clear. It is assume that this reference is linked to the “Trunked Mobile BTX” entry in column 3; if this is the case, it should be aligned accordingly.
- The entry “This band is currently used for a variety of fixed and mobile systems in various SADC countries” is perplexing for a number of reasons:
    - This comment has been entered only within the sub-band 450-455 MHz. The reference to “This band” therefore refers only to this sub-band in the table, which seems incorrect. At least the entry should be added to all sub-bands within the range 450-470 MHz (assuming that the entry refers to this band).
    - Whereas the use of spectrum in SADC, and in particularly our neighbouring countries are important for purposes of cross border frequency sharing, this statement is too broad and does not provide any specific information that could be used for such purpose.
    - It is not clear why this statement has been added only to this frequency band as similar references should in theory be added to many allocations within the NRPF-17.
    - Telkom recommends that this statement be deleted.
- See comment in section 2.5 regarding the reference to Recommendation M.1036.

459-460 MHz FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	**459-460 MHz** FIXED MOBILE 5.286AA NF9 5.209 5.271 5.286A	Trunked Mobile BTX 454.425 – 460 MHz IMT450 (450 – 470 MHz) Government Services	Paired with 464.425 – 470 MHz. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015 Recommendation ITU-R M.1036

- As indicating in section 2.5, Telkom recommends that the reference to Recommendation M.1036 be deleted. If retained, the reference to “Recommendation ITU-R M.1036” in column 4 should be aligned directly with “IMT450 (450-470 MHz)” in column 3.
- As indicated above, it is recommended that the reference to “Government Services” be associated directly with Trunked Mobile.
- Within this sub-band the Authority added a reference to the Radio Frequency Assignment Plan (RFSAP) as published in Government Gazette No. 38640.

Telkom recommends that this reference be added to all sub-bands within the frequency range 450-470 MHz.

460-470 MHz FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth) 5.287 5.288 5.289 5.290	**460-470 MHz** FIXED MOBILE 5.286AA NF9 5.287 5.289	Fixed Links (460 – 463 MHz) Single Frequency Mobile (463.025 – 463.975 MHz) Low Power Mobile Radio (463.975 MHz, 464.125 MHz, 464.175 MHz, 464.325 MHz, 464.375 MHz) Single Frequency Mobile (464.375 – 464.425 MHz) Trunked Mobile MTX (464.425 – 470 MHz) IMT450 (450 – 470 MHz) Security Systems (464.5375 MHz) Non-specific SRDs (464.5 – 464.5875 MHz) Government Services	Paired with 450 – 453 MHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115). Recommendation ITU-R M.1036 Paired with 454.425 – 460 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115).

- Telkom recommends that the alignment between columns 3 and 4 be done (see section 2.1).
- The reference to “Government Services” must associated with the relevant entry in column 3 (i.e. Single Frequency Mobile or Trunk Mobile) and not be placed at the bottom of the table as it may create uncertainty.
- The entry “International Mobile Telecommunication Roadmap (GG No. 38213) 14 November 2014” should be added to all sub-bands within the range 450-470 MHz and entries should be aligned directly with the IMT450 entry in column 3.

3.5 Frequency Band 470 – 694 MHz

470-694 MHz BROADCASTING	**470-694 MHz** BROADCASTING	DTT Broadcasting (470-694 MHz)	Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting
5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312	RADIO ASTRONOMY 5.304 5.149 5.311A	Radio Astronomy (606 – 614 MHz) SAP/SAB Applications	Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television to migrate to digital television in line with SADC time lineThe use of ‘White Spaces’ in this band is under consideration (subject to NINP basis to users under a primary allocation).470 - 606 MHz, max. 50 mW ERP 606 - 614 MHz, max. 50 mW ERP

Telkom wishes to make the following comments and/or recommendations pertaining to the band 470-694 MHz:

- It is indicated in column 4 that “Analogue television to migrate to digital television in line with SADC time lines”. It seems inappropriate to make such reference for the following reasons:
    - ICASA did not provide details as to the SADC time lines for television migration; it is therefore not clear what these dates are and where information pertaining to this can be found.
    - It is not clear how the SADC time lines relate to the South African process of television migration noting that South Africa is behind several SADC countries in terms of migration. Television migration in SADC countries are also at varying stages of migration.
    - The South African timelines for digital migration, in particular analogue switch off, still has to be announced by the Minister of Communications, which is not dependent on the SADC time lines.

  Telkom therefore recommends that this statement be deleted or be revised in order to reflect the South African migration time lines.

- The Authority added a comment in column 4 specifying maximum ERP values for the frequency bands 470-606 MHz and 606-614 MHz. The purpose and application of this entry is not clear. Although the low power suggests that these ERP restrictions may apply to SAP/SAB, this is not clear. The following is observed regarding the ERP values:
    - While the ERP values are restricted to the frequency bands 470-606 MHz and 606-614 MHz, it is understood that the SAP/SAB application applies to the entire band 470-694 MHz.
    - The way it has been captured in the table, it could be interpreted that the ERP values relate to white space devices although this seems inappropriate.

- The two specified frequency bands seems to be somehow related to the radio astronomy use within the band 606-614 MHz although this is also not clear.
- The ERP values for both (adjacent) frequency bands are the same so it is not clear why these two bands have been specified separately.
- No ERP value has been specified for the band 614-694 MHz.

Telkom requests the Authority to clarify this entry.

3.6 Frequency Band 694 – 790 MHz

694-790 MHz MOBILE except aeronautical mobile 5.312A 5.317A 5.300 5.311A 5.312	**694-790 MHz** MOBILE except aeronautical mobile 5.312A 5.317A 5.311A	IMT700 (694 – 790 MHz)	International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. IMT in accordance with ITU-R Recommendation M.2090 and Resolution **760 (WRC-15)** applies Recommendation ITU-R M.1036

Telkom wishes to make the following comments and/or recommendations pertaining to the band 694-790 MHz:

- The Authority deleted the “BROADCASTING” allocation from columns 1 and 2 within this frequency band. Whereas the deletion of this allocation from column 2 (SA Allocations) could be supported, it should not be removed from column 1. The purpose of column 1 is to reflect accurately or mirror the ITU allocations for Region 1. It is Telkom’s view therefore that this column should retain all Region 1 allocations as per Article 5 of the ITU Radio Regulations, which is the standard used in the NRFP.
- Whereas reference is made to migration of terrestrial television from the band 470-694 MHz, there is no reference to broadcasting migration in the band 694-790 MHz. Telkom recommends that this information be added to this frequency band as it is relevant.

- Telkom recommends that the Authority adds a reference to WRC-12 allocating this band for mobile and identified it for IMT. This is in line with a similar reference made in the band 790-862 MHz.
- As indicated in section 2.5, it is recommended that the reference to M.1036 be deleted.

3.7 Frequency Band 790 – 862 MHz

790-862 MHz FIXED MOBILE except aeronautical mobile 5.316B 5.317A 5.312 5.319	**790-862 MHz** FIXED MOBILE except aeronautical mobile 5.316B 5.317A	Fixed Links (856 – 864.1 MHz) IMT800 BTX (791 – 821 MHz) Mobile Wireless Access (827.775 – 832.695 MHz) IMT800 MTX (832 – 862 MHz) Television Broadcasting (470 – 854 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 fixed links have to be migrated along with the broadcasting service in line with Radio Frequency Migration Plan. Band IV/V analogue television to migrate to digital television according to SADC time lines. WRC-07, WRC-12and WRC-15 allocated this band to Mobile service except aeronautical mobile and identified it for IMT. Fixed links operating in this band will have to be migrated in order to accommodate IMT.

Telkom wishes to make the following comments and/or recommendations pertaining to the band 790-862 MHz:

- Regarding the deletion of “BROADCASTING” allocation from columns 1 and 2 – see Telkom’s comments to band 694-790 MHz.
- Reference to both RFSAP and ITU-R Rec. M.1036 – see Telkom’s comments in section 2.5.
- Reference to SADC migration timelines – see Telkom’s comments to the band 694-790 MHz.
- There are two comments on the migration of fixed links in column 4. Telkom recommends that these two comments be combined into one.
- It is not clear why the statement regarding broadcasting in this band has been retained whereas all references to broadcasting has been deleted from the band 694-790 MHz. Telkom recommends that this band be aligned with the band 694-790 MHz in terms of how and when broadcasting systems will be migrated.

- It is stated in column 4 that "WRC-07, WRC-12 and WRC-15 allocated this band to mobile services except aeronautical mobile and identified it for IMT". Technically this is incorrect. The allocation of this band to mobile and its identification for IMT happened at WRC-07. Subsequent conferences dealt with the outcome of sharing studies; WRC-12 and WRC-15 did not "allocate" the band to mobile (again). Telkom recommends that the statement reads: "WRC-07 allocated this band to mobile services except aeronautical mobile and identified it for IMT".
- Within this band, the sub-band 827.775 – 832.695 MHz is used for "Mobile Wireless Access". This sub-band is paired with 872.775 – 877.695 MHz according to NRFP-13 and as reflected in the band 862-890 MHz in the draft NRFP-17. It is not clear therefore why the Authority removed the reference to the paired sub-band from column 4 in the draft Plan. See also comments pertaining to the band 827.775-832.695 MHz in section 3.8 below.

3.8 Frequency Band 862 – 890 MHz

862-890 MHz FIXED MOBILE except aeronautical mobile 5.317A	**862-890 MHz** FIXED MOBILE except aeronautical mobile 5.317A NF10	Fixed Links (856 – 864.1 MHz) Fixed Wireless Access (872.775 – 877.695 MHz) GSM-R (MTX) (877.695 – 880 MHz) NF10 IMT900 MTX (880 – 915 MHz)	Paired with 868.1 – 876 MHz Paired with 827.775 – 832.695 MHz Paired with 921 – 925 MHz Paired with 925 – 960 MHz
BROADCASTING 5.322 5.319 5.323		Wireless Audio systems and Wireless microphones (863 – 865 MHz) CT2 cordless phones (864.1 – 868.1 MHz) CT2 FWA (864.1 – 868.1 MHz) RFID (865 – 868 MHz) Non-specific SRD and RFID (869.4 – 869.65 MHz) Non Specific SRDs (868 – 868.6 MHz, 868.7 – 869.2 MHz, 869.4 – 869.65 MHz, 869.7 – 870.0 MHz) Alarms (868.6 – 868.7 MHz, 869.25 – 869.3 MHz, 869.65 – 869.7 MHz) 862-876 MHz IMT	Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115). Recommendation ITU-R M.1036

Telkom wishes to make the following comments and/or recommendations pertaining to the band 862-890 MHz:

- The sub-band 872.775 – 877.695 MHz (paired with 827.775 – 832.695 MHz) is indicated as "Fixed Wireless Access" applications (own emphasis). However, in

the band 790-862 MHz, it is indicated that the band 827.775 – 832.695 MHz is used for "Mobile Wireless Access" (own emphasis). This discrepancy must be corrected.

- It is also noted that there are discrepancies between the draft NRFP-17 (and the NRFP-13) and the IMT Roadmap with regards to Fixed/Mobile Wireless Access and GSM-R use (PRASA) within this band. This confusion is compounded by the amendments to NF10. According to the new NF10, the band 876-880 MHz paired with 921-925 MHz is used by GSM-R systems (own emphasis). According to the table (column 3), the lower end of GSM-R starts at 877.695 MHz. Telkom requests that these discrepancies be corrected.
- The Authority made two new entries to column 3 to indicate that the bands 862-876 MHz and 876-880 MHz are typically used for IMT. The intention with these entries is not clear. The sub-band 876-880 MHz is used for GSM-R; however, the other GSM-R sub-band (921-925 MHz) has not been identified for IMT, which is very peculiar. While the sub-band 862-876 MHz has also been earmarked for IMT, this sub-band is not paired with 921-925 MHz (or any other band). This sub-band is also not specifically addressed within the draft Plan or the IMT Roadmap (except that it is partially overlapping the band 870-875 MHz proposed as a Neotel assignment). It is also noted that these two bands are not listed in ITU-R M.1036 as IMT frequency bands. Based on the amendments to the frequency band 890-942 MHz (see section 3.9 below), it would seem that the intention is to identify the GSM-R frequency band for IMT. Telkom requests the Authority to clarify these two new IMT bands.
- Telkom recommends that the "CT2 FWA" application in the band 864.1 – 868.1 MHz be changed to "FWA". FWA in this band should not be limited to one specific technology.
- Telkom recommends that the reference to ITU-R Rec. M.1036 be replaced by a reference to the RFSAP.

3.9 Frequency Band 890 – 942 MHz

890-942 MHz FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation 5.323	**890-942 MHz** MOBILE except aeronautical mobile 5.317A NF9 NF10 NF11	GSM-R (BTX) (921 - 925 MHz) IMT900 MTX (880 – 915 MHz) IMT900 BTX (925 – 960 MHz) RFID (including, passive tags and vehicle location (915.1 – 921 MHz) 915-921 MHz	Paired with 877.695 – 880 MHz Paired with 925 – 960 MHz Paired with 880 – 915 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Recommendation ITU-R M.1036
		921-925 MHz IMT PMR and/or PAMR	Paired with 876-880 MHz.
		925-960 MHz IMT	Paired with 880-915 MHz

Telkom wishes to make the following comments and/or recommendations pertaining to the band 890-942 MHz:

- GSM-R in the band 921-925 MHz is reflected twice in column 3. In line with the comments made in section 3.8, the return band for GSM-R has been indicated as 877.695-880 MHz and 876-880 MHz. This discrepancy creates confusion and should be corrected. Telkom recommends that the second entry (the new entry) be deleted while the return band is also corrected.
- The frequency bands for IMT900 (925-960 MHz paired with 880-915 MHz) have been duplicated in columns 3 and 4. Telkom recommends that the second entry (the new entry) be deleted. There is also no alignment between columns 3 and 4 with regards to these entries, which may create uncertainty.
- Telkom recommends that the reference to ITU-R Recommendation M.1036 be deleted; see comments in section 2.5.
- Immediately after the RFID entry, an additional entry for the band 915-921 MHz has been entered in column 3. However, there is no indication as to what

application is relevant in this band. It is noted that this band is almost the same as the RFID band. Telkom recommends to delete this entry.

3.10 Frequency Band 942 – 960 MHz

FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	MOBILE except aeronautical mobile 5.317A NF9	IMT900 BTX (925 – 960 MHz)	Paired with 880 – 915 MHz Recommendation ITU-R M.1036

Telkom wishes to make the following comments and/or recommendations pertaining to the band 942-960 MHz:

- Telkom recommends that the reference to ITU-R Rec. M.1036 be replaced by a reference to the RFSAP.

3.11 Frequency Range 960 – 1164 MHz

960-1 164 MHz AERONAUTICAL RADIONAVIGATION 5.328 5.328AA AERONAUTICAL MOBILE (R) 5.327A	**960-1 164 MHz** AERONAUTICAL RADIONAVIGATION 5.328 5.328AA AERONAUTICAL MOBILE (R) 5.327A	Distance measuring equipment / Secondary surveillance radar	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 960 – 1164 MHz:

- The presentation of services and footnotes in columns 1 and 2 in this frequency block is not accurate and may create uncertainty. Telkom recommends that the two services should be reflected alphabetically as per ITU Radio Regulations Article 5. More importantly, the FN 5.328AA should be at the bottom of the table; as it is presented now it seems to be relevant to aeronautical radionavigation service only. These changes are applicable to both columns 1 and 2.

3.12 Frequency Range 1350 to 1518 MHz

1 350-1 400 MHz FIXED MOBILE RADIOLOCATION 5.149 5.338 5.338A 5.339	**1 350-1 400 MHz** FIXED NF 14 MOBILE RADIOLOCATION Radio Astronomy 5.149 5.338A 5.339	1 350-1 375 MHz Fixed links (duplex) 1 375-1 400 MHz Fixed links (duplex)	Paired with 1492-1517 MHz; CEPT T/R 13-01 refers. Paired with 1427-1452 MHz; CEPT T/R 13-01 refers.
1 427-1 429 MHz SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341	**1 427-1 429 MHz** SPACE OPERATION (Earth-to-space) FIXED NF14 MOBILE except aeronautical mobile 5.341A 5.338A 5.341	1 427-1 452 MHz Fixed links (duplex)	Paired with 1 375 – 1 400 MHz In accordance with Recommendation ITU-R F.1242
1 429-1 452 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341 5.342	**1 429-1 452 MHz** FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341	1 427-1 452 MHz Fixed links (duplex)	Paired with 1 375 – 1 400 MHz) In accordance with Recommendation ITU-R F.1242
1 452-1 492 MHz FIXED MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	**1 452-1 492 MHz** FIXED NF14 MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.345 NF12	Terrestrial Digital Audio Broadcasting (T-DAB) (1 452 – 1 479.5 MHz) Satellite Digital Audio Broadcasting (S-DAB) (1 479.5 – 1 492 MHz)	The Terrestrial Broadcasting Frequency Plan (GG No.36321) 02 April 2013. IMT Res. 223 (Rev.WRC-15) IMT Res. 223 (Rev.WRC-15)
1 492-1 518 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.341 5.342	**1 492-1 518 MHz** FIXED MOBILE except aeronautical mobile 5.341A 5.341	Fixed Links (1 492 – 1 517 MHz) Single Frequency Links (1 517 – 1 525 MHz)	Paired with 1 350 – 1 375 MHz In accordance with Recommendation ITU-R F.1242 IMT Res. 223 (Rev.WRC-15)

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 1350 – 1518 MHz:

- Use of fixed services in the frequency bands 1350 – 1400 MHz, 1427-1452 MHz and 1492-1517 MHz:
    - There are two bands available for fixed links in the frequency range 1350 MHz to 1452 MHz namely:
        - 1350-1375 MHz paired with 1492-1517 MHz (Tx-Rx = 142 MHz)

- 1375-1400 MHz paired with 1427-1452 MHz (Tx-Rx = 52 MHz)

- In the NRFP-13, in the frequency range 1350-1400 MHz, the channelling plans are indicated as those contained in ITU-R F.1242 (Recommends 1 and 2). However, for the frequency bands 1427 – 1452 MHz and 1492 – 1518 MHz, the channelling plans are indicated as CEPT T/R 13-01 (Annex A and Annex B). In essence the ITU-R and CEPT plans are the same. Telkom agrees that this inconsistency needs to be corrected and that reference be made to the ITU-R channelling plans rather than the CEPT channelling plans.

- In the draft NRFP-17, the Authority proposes to change all the references to these fixed link bands (i.e. ITU-R changed to CEPT and CEPT changed to ITU-R). It is not clear why the Authority decided to make these changes as it is changing one inconsistency with another. Telkom recommends that all these channelling plans refer to the ITU-R Recommendation.

- Use of the band 1427 – 1518 MHz for IMT:

  - WRC-15 decided that, in Region 1, the frequency bands 1427 – 1452 MHz and 1492 – 1518 MHz are identified for IMT services (see FN 5.341A). WRC-15 also decided that, in many African countries, including South Africa, the frequency range 1452 – 1492 MHz is identified for IMT (see FN 5.346). Both these FNs should be added to column 2 “South African allocations and footnotes”.

  - Reference has also been made to Resolution **223 (WRC-15)** in the frequency bands 1452 – 1492 MHz and 1492 – 1518 MHz. No reference to this resolution has however been made to the frequency range 1427 – 1452 MHz. Since the band 1427 – 1518 MHz has been added to NF9 in the draft Plan, Telkom recommends that the Authority adds reference to Resolution **223 (WRC-15)** also to the bands 1427 – 1429 MHz and 1429 – 1452 MHz in column 4.

- Reference to NF9 should also be added to all frequency bands within the range 1427 – 1518 MHz in column 2 of the NRFP-17.

- Telkom seeks clarity with regards to the continued use of fixed links and Digital Audio Broadcasting ("DAB") within the applicable frequency bands within this frequency range. It is not clear if the Authority plans to migrate the existing systems from these frequency bands or to what extent these services will continue to operate on a shared basis with IMT. Whereas fixed links are currently operating within the fixed link bands, it is not clear if there are any broadcasting or broadcasting satellite services operating in the band 1452 – 1492 MHz.

- With regards to DAB specifically, the Authority proposed to delete NF12 from the draft NRFP-17. The references to T-DAB and S-DAB as typical applications in the frequency bands 1452 – 1479.5 MHz and 1479.5 – 1492 MHz respectively have however been retained. The future use of the band 1452 – 1492 MHz in South Africa is therefore not clear. On the one hand IMT could be allowed although the use of T-DAB and S-DAB will seemingly continue. It is also noted that, although the majority SADC members were of the view that the allocation to T-DAB in the band 1452-1492 MHz is no longer required (see section 4, paragraph *g.* of the SADC FAP 2016), these services have also been retained in the SADC Frequency Allocation Plan.

- Telkom recommends that the entire frequency range 1427 – 1518 MHz be made available for IMT services in South Africa in the future, in line with WRC-15 decisions. To this extent, the references to T-DAB and S-DAB as services and typical applications in columns 2 and 3 respectively should be deleted from the draft table, assuming that these services are currently not being used in South Africa. Alternatively, NF12 should be retained and the future use of this band for either IMT or broadcasting should be further debated. If the Authority decides to keep with its decision to deleted NF12 from section 5 of the draft NRFP-17, the reference to this footnote in the band 1452-1492 MHz (column 2 of the draft Plan) should be deleted.

- The Authority correctly added references to FN 5.341A in the frequency bands 1427 – 1452 MHz and 1492 – 1518 MHz. However, the content of this FN in section 6 of the draft Plan is incorrect. The current text is the same as FN 5.338A. The correct text for 5.341A should be:

  "***5.341A*** *In Region 1, the frequency bands 1 427-1 452 MHz and 1 492-1 518 MHz are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution* ***223 (Rev.WRC-15)****. This identification does not preclude the use of these frequency bands by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No.* ***9.21*** *with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No.* ***5.342****. (WRC-15)*"

- The Authority indicated in the table in the draft Plan that FN 5.342 has been updated, which is correct. However, the FN itself has not been updated in section 6 of the draft Plan. The correct text is:

  "*Additional allocation: in Armenia, Azerbaijan, Belarus, the Russian Federation, Uzbekistan, Kyrgyzstan and Ukraine, the frequency band 1 429-1 535 MHz is also allocated to the aeronautical mobile service on a primary basis, exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the frequency band 1 452-1 492 MHz is subject to agreement between the administrations concerned. (WRC-15)*"

- The Authority indicated in the draft Table that FN 5.345 has been amended (yellow highlight). This FN was however not amended at WRC-15. FN 5.342 has however been amended (although not relevant to South Africa).

3.13 Frequency Range 1518 to 1525 MHz

1 518-1 525 MHz FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.342	**1 518-1 525 MHz** FIXED MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.351A 5.341	Single Frequency Links (1 517 – 1 525 MHz) IMT Satellite component	In accordance with Recommendation ITU-R F.1242 The band 1518-1559 MHz is identified for satellite component of IMT; Res.225 applies.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 1518 – 1525 MHz:

- No changes have been made to this frequency band during WRC-15. Nevertheless, Telkom recommends that the Authority review the use of this band especially as it relates to single frequency links. Noting the potential use of the bands above 1518 MHz for satellite services (such as Inmarsat), it is recommended that fixed links operating in this band be migrated.

- The Authority changed the CEPT Recommendation T/R 13-01 reference to ITU-R Recommendation F.1242. Although Telkom supports referring to ITU-R Recommendations rather than CEPT Recommendations, Telkom recommends that this reference be reviewed since neither of the two channelling plans refers to the use of the band above 1518 MHz for fixed links (single or duplex).

3.14 Frequency Range 1710 to 1930 MHz

1 710-1 930 MHz FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.387 5.388	**1 710-1 930 MHz** FIXED MOBILE 5.384A 5.388A NF9 5.149 5.341 5.385 5.388	DECT FWA (1880 – 1900 MHz) FWA TDD (1900 – 1920 MHz) Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) DECT Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz) 1 710-1 785 MHz IMT	Paired with BTX 1805 – 1880 MHz. Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115) Paired with 1710-1785 MHz.
		1785-1805 MHz BFWA	
		1 805-1 880 MHz IMT 1 880-1 900 MHz FWA Cordless telephone 1 900-1 920 MHz FWA IMT (terrestrial) 1 920-1 980 MHz	Paired with 1805-1880 MHz. IMT TDD applications (Future) Paired with BTX 2110 – 2170 MHz. Paired with 2110-2170 MHz
		IMT (terrestrial)	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 1710 – 1930 MHz:

- The Authority added the entry “1710-1785 MHz IMT” in column 3 of the draft NRFP-17. It is not clear why this was added since the column already contains the entry “IMT1800 MTX (1710-1785 MHz)”. Telkom recommends that the new addition be deleted or be merged with the existing entry.
- Similar to the above, the Authority added the entry “1785-1805 MHz BFWA” in column 3 of the draft NRFP-17. It is not clear why this was added since the column already contains the entry “Fixed Broadband data applications (1785-1805 MHz)”. Telkom recommends that the new addition be deleted or be merged with the existing entry.
- The Authority made several additional entries/changes to column 3 of the draft table as indicated below. These additional entries/changes (not highlighted as additions/changes in the draft plan per se) may create confusion in reading and interpreting the NRFP-17 and is addressed further below:

1 805-1 880 MHz IMT 1 880-1 900 MHz FWA Cordless telephone 1 900-1 920 MHz FWA IMT (terrestrial) 1 920-1 980 MHz	Paired with 1805-1880 MHz. IMT TDD applications (Future) Paired with BTX 2110 – 2170 MHz. Paired with 2110-2170 MHz
IMT (terrestrial)	

- The Authority added the return path for IMT1800 in column 3 of the table i.e. “1805-1880 MHz IMT”. Whereas Telkom agrees with this addition, the paired frequency in column 4 (“1805-1880 MHz”) is incorrect and should be changed to “1710-1785 MHz”. Further, to align with nomenclature used in other parts of the band, Telkom recommends that the entry in column 3 be changed to “IMT1800 BTX (1805-1880 MHz)”.
- The entry “1880-1900 MHz / FWA / Cordless telephone” is unclear as it contradicts the existing entries. Although it seems that the intention is to broaden the scope of the use of the band 1880-1900 MHz from DECT only systems (FWA and cordless telephones) to any type of FWA and cordless telephones, this is not clear. Telkom does not support the broadening of scope of this band as it has not yet been proven that these systems will be able to co-exist with the current systems. If broadening of the band is the intention of the Authority, Telkom requests that sharing studies and additional analysis be done prior to taken this decision to ensure compatibility between existing and proposed new systems. It also seems that these cordless telephones will not have to adhere to the technical and regulatory restrictions as per the Radio Frequency Spectrum Regulations (GG 38641 dated 30 March 2015), which needs further clarification.
- The additional entry “1900-1920 MHz / FWA / IMT (terrestrial)” is also not clear as there are already entries for “IMT1900 TDD (1900-1920 MHz)” and “FWA TDD (1900-1920 MHz)” in the plan. Telkom recommends that the additional entries be deleted or verified.
- Telkom recommends that the reference to “Future” for the band 1900-1920 MHz be deleted as this band is part of the IMT designated frequency

bands. Telkom further also recommends that this band (i.e. IMT1900 (1900-1920 MHz) be added to the table in NF9.

- Telkom also recommends that the Authority adds reference to ITU-R Recommendation M.1036 (see Table 4 of M.1036) as done elsewhere in the document with other IMT frequency bands.
- The additional entries "1920-1980 MHz / IMT (terrestrial)" and "Paired with 2110-2170 MHz" are also not clear because similar entries are already contained in the plan. Also, the addition of the word "terrestrial" is not necessary as per standard practice (only delineate IMT satellite). Telkom recommends that these issues be addressed.
- The line separation between the entries "1920-1980 MHz" and "IMT (terrestrial") are also confusing and must be corrected. Further, the entry "Paired with 2110-2170 MHz" appears twice in column 4 of the draft NRFP-17 and it is recommended that one entry be deleted.

- Alignment of entries between columns 3 and 4 is also necessary to ensure proper reading of the table.

3.15 Frequency Range 1980 to 2010 MHz

1 980-2 010 MHz FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F	**1 980-2 010 MHz** FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A NF13	Fixed links (1980 – 2010 MHz) CGC/ATC fixed systems (1980 – 2010 MHz) IMT-satellite IMT (satellite) (1980-2010 MHz)	Paired with 2170 – 2200 MHz Paired with 2170 – 2200 MHz (future) The development of satellites for IMT services to be monitored.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 1980 – 2010 MHz:

- The Authority added a reference to "IMT (satellite) (1980-2010 MHz)" in column 3 whereas a similar reference already exists ("IMT-satellite"). This duplication should be avoided and the additional text should therefore be deleted or merged with the existing text.
- Telkom supports the addition of the reference "The development of satellites for IMT services to be monitored". It should be noted that satellite systems for IMT are being developed for operating in this frequency band and this spectrum should be made available for such use. In any event, further studies regarding, amongst

others, the shared use between terrestrial and satellite IMT systems are under study within the ITU-R and the outcome of these studies will be reported to WRC-19 (see Resolution 223 (Rev. WRC-15)).

- NF13 states that "the implementation of IMT in the bands 1850-2025 MHz and 2110-2200 MHz is under study within ITU-R in accordance with Resolution 212 (Rev.WRC-15)". This statement is not factually correct.
    - Resolution 212 (Rev.WRC-15) deals with the frequency bands 1885-2025 MHz and 2110-2200 MHz.
    - In accordance with the Resolution, ITU-R studies are limited to the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz.
    - In can also be mentioned in NF13 that the results of the ITU-R studies as indicated above, will be included in Directors report to WRC-19.

3.16 Frequency Range 2010 to 2025 MHz

2 010-2 025 MHz FIXED MOBILE 5.388A 5.388B 5.388	**2 010-2 025 MHz** FIXED MOBILE 5.388A NF9 5.388	IMT TDD (2010 – 2025 MHz)	IMT TDD applications (Future) Recommendation ITU-R M.1036

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2010 – 2025 MHz:

- As indicated above, the reference to M.1036; see comments in section 2.5.
- The reference to "Future" could also be deleted as the band is an IMT band in accordance with 5.388A. These band could also be added to the Table in NF9.

3.17 Frequency Range 2025 to 2110 MHz

2 025-2 110 MHz SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	**2 025-2 110 MHz** FIXED NF14 5.392	Fixed Links (2025 – 2110 MHz) Fixed links (2025-2110 MHz paired with 2200-2285 MHz)	Paired with 2200 – 2285 MHz. ITU-R Rec. F.1098 refers. Radio Frequency channel arrangement according to ITU-R F.1098.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2025 – 2110 MHz:

- The use of this band for fixed links has been entered twice in column 3. Further, the return frequency band (i.e. 2200 – 2285 MHz) should not be captured in column 3 but in column 4 as for all other frequency bands. Telkom recommends that the new addition be deleted.
- The Authority added a second reference to the ITU-R channelling plan and it is recommended that the additional reference be deleted. Alternatively, the reference to channelling plan can be deleted since such reference is contained in the NRFP-17 in NF14.

3.18 Frequency Range 2110 to 2170 MHz

2 110-2 120 MHz FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388	**2 110-2 120 MHz** FIXED MOBILE 5.388A NF9 5.388	IMT2100 BTX (2110 – 2170 MHz)	Paired with 1920 – 1980 MHz. Recommendation ITU-R M.1036
2 120-2 160 MHz FIXED MOBILE 5.388A 5.388B 5.388	**2 120-2 160 MHz** FIXED MOBILE 5.388A NF9 5.388	IMT-2100 BTX (2110 – 2170 MHz)	Paired with 1920 – 1980 MHz. Recommendation ITU-R M.1036
2 160-2 170 MHz FIXED MOBILE 5.388A 5.388B 5.388	**2 160-2 170 MHz** FIXED MOBILE 5.388A NF9 5.388	IMT2100 BTX (2110 – 2170 MHz)	Paired with 1920 – 1980 MHz. Recommendation ITU-R M.1036

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2110 – 2170 MHz:

- Telkom recommends that the reference to Recommendation ITU-R M.1036 be deleted; see comments in section 2.5.

3.19 Frequency Range 2170 – 2200 MHz

2 170-2 200 MHz	**2 170-2 200 MHz**		
FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F NF13	Fixed Links (2170 – 2200 MHz) CGC/ATC fixed systems (1980 – 2010 MHz) IMT-satellite IMT (satellite) (2170-2200 MHz)	Paired with 1980 – 2010 MHz Paired with 2170 – 2200 MHz (future) Radio Frequency channel arrangement according to ITU-R F.1098.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2170 – 2200 MHz:

- The Authority added an additional reference to “IMT (satellite) (2170-2200 MHz)” in column 3 for the band 2170 – 2200 MHz. It is not clear why this additional text has been added since there is an existing reference to the use of this band for IMT (satellite). Telkom recommends that this additional reference to IMT (satellite) be deleted or merged with the existing text.
- The Authority added a reference to ITU-R Recommendation F.1098 for the band 2170 – 2200 MHz paired with 1980 – 2010 MHz. The applicability of this recommendation to this frequency band must be verified; it is Telkom’s view that it does not provide a channelling plan for this frequency band.
- Telkom recommends that the frequency bands associated with CGC/ATC fixed systems recorded in columns 3 and 4 be swapped; i.e. the entry in column 3 should be: “CGC/ATC fixed systems (2170 – 2200 MHz)” whereas the entry in column 4 should read: “Paired with 1980 – 2010 MHz”. This is incorrect in the NRFP-13.
- Telkom further recommends that the text “The development of satellites for IMT services to be monitored” be added in column 4 for the band 2170 – 2200 MHz. The same text has been added to the frequency band 1980 – 2010 MHz. See also comments on the use of IMT satellite services in this band in section 3.15.

3.20 Frequency Range 2200 – 2300 MHz

2 200-2 290 MHz SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392	**2 200-2 290 MHz** SPACE OPERATION (space-to-Earth) (space-to-space) FIXED NF14 MOBILE 5.391 5.392	TT&C received from space Fixed Links (2025 – 2110 MHz paired with 2200 – 2285) Fixed Links (2200 – 2285 MHz) BFWA (2 285-2 300 MHz)	 Radio Frequency Channel arrangements in accordance with ITU-R F.1098 Paired with 2025 – 2110 MHz ITU-R Rec. F.1098 refers.
2 290-2 300 MHz FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	**2 290-2 300 MHz** FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	Fixed Links	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2200 – 2300 MHz:

- The Authority added the application “BFWA (2285 – 2300 MHz)” to the band 2200-2290 MHz. The use of BFWA in this band should be considered with caution for a number of reasons:
    - This band is immediately adjacent to Telkom’s deployment of IMT services operating above 2300 MHz. No adjacent band compatibility studies have been conducted and therefore the use of this band for BFWA has not been proven. Compatibility studies will be required prior to the deployment of BFWA in the band 2285-2300 MHz.
    - Since Telkom already deployed its IMT network (TDD) starting at 2300 MHz, any required guard bands will have to come from the band 2285-2300 MHz. It is presumed that this band will be used for TDD and synchronisation with Telkom’s TDD network will be responsibility of the new operator.
    - Studies pertaining to frequency sharing with space operation services will also be required.
- If the Authority retain the use of the band 2285-2300 MHz for BFWA, this should be added also to the frequency band 2290-2300 MHz in the Table.

3.21 Frequency Range 2300 – 2450 MHz

2 300-2 450 MHz FIXED	**2 300-2 450 MHz** FIXED	FWA (PTP/PTMP) (2307-2387 MHz) Outside Broadcast Links	Paired with 2401 – 2481 MHz 28 MHz channels OB links. Frequency co-ordination with other systems operating in the band is mandatory on a case-by-case basis. Primary basis: 2377 MHz and 2471 MHz. Secondary basis: 2321 MHz, 2349 MHz, 2415 MHz and 2443 MHz
MOBILE 5.384A Amateur Radiolocation 5.150 5.282 5.395	MOBILE 5.384A NF9 Amateur 5.150 5.282	FWA (PTP/PTMP) (2401 – 2481 MHz) IMT2300 TDD (2300 – 2400 MHz) WLAN, FDDA and model ctrl. (2400 – 2483.5 MHz) Non-Specific SRDs and low power video surveillance (2400 – 2483.5 MHz) RFID (2 400 – 2 483.5 MHz) ISM applications (2400 – 2500 MHz) 2300-2400 MHz Fixed links PTP/PTMP IMT (TDD)BFWA	Paired with 2307-2387 MHz International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Assignment Plan (GG N. 38640) as amended 30 March 2015. Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115). Recommendation ITU-R M.1036 8) Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115). Fixed paired with 2400-2500 MHz. This band has been identified for IMT.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2300 – 2450 MHz:

- Telkom recommends that the reference to the use of the band 2300-2400 MHz for Outside Broadcasting (OB) links be deleted. The use of this band for OB links (primary and secondary use) requires frequency coordination with existing users. No frequency coordination requests for OB links have been received by Telkom for many years and it therefore seems that this band is no longer needed for OB links. If this entry to the table cannot be deleted at this stage, Telkom recommends that the use of this band for OB links be further investigated with the view to remove such use. An appropriate reference should be added to column 4 of the draft NRFP-17.

- Telkom recommends that the reference to Recommendation M.1036 be deleted; see comments in section 2.5.

- There are two references to the Radio Frequency Spectrum Regulations (GG. No. 38641). Telkom recommends that one be deleted. The “8)” in front of the second entry seems like an editorial issue.

- The Authority added “2300-2400 MHz / Fixed links PTP/PTMP /IMT (TDD)BFWA” to column 3 of the draft Table. For fixed services the band is paired with 2400-2500 MHz. Telkom has concerns regarding this new entry because:

    - The bands 2300-2400 MHz paired with 2400-2500 MHz overlaps the band currently used for FWA (PTP/PTMP), which operates in the band 2307 – 2387 MHz paired with 2401 – 2481 MHz. It is not clear if this is a new application or to be seen as the same application.

    - The bands 2307 – 2387 MHz paired with 2401 – 2481 MHz are used in accordance with ITU-R Recommendation F.746, Annex 1. This channelling plan accommodates 80 channel pairs of 2 MHz each and is limited to below 2483.5 MHz. By extending the application of fixed links (PTP/PTMP) to the entire band 2300-2500 MHz, it is not clear if the intention is to remain with the existing channelling plan or if the Authority foresees the use of the full 200 MHz using another channelling plan Telkom could not identify a channelling plan other than ITU-R Rec. F.746 applicable to this frequency band. If another channelling plan is envisage, the necessary frequency sharing studies will be required to ensure that the two plans are compatible.

    - Fixed links must be migrated from the band 2300 – 2400 MHz, in order to accommodate IMT. This is pending the completion of a feasibility study (according to the Frequency Migration Plan and the RFSAP). To introduce a new application of fixed links in the band 2300-2500 MHz goes against the objective of migrating fixed links from this band.

- The addition of “IMT (TDD)/BFWA” for the band 2300-2400 MHz also seems like a duplication as the column already contains the entry “IMT2300 TDD (2300-2400 MHz)”. Telkom recommends that the new addition be deleted. If needed, the reference to BFWA could be added to the existing IMT2300 reference. It is

also noted that BFWA could be deployed using IMT technologies so specifying this separately is not required.

- The Authority added the phrase “This band has been earmarked for IMT” in the last column of the table. It is however not clear to which “this band” the Authority is referring to. Whereas the table deals with 2300-2450 MHz, the entry immediately above this phrase refers to the band 2400-2500 MHz. None of these are correct since the IMT band is 2300-2400 MHz. Since a reference to the IMT Road Map and the RFSAP has been added, and the band is indicated as IMT, Telkom recommends that this additional phrase be deleted.

3.22 Frequency Range 2483.5 – 2500 MHz

2 483.5-2 500 MHz FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 Radiolocation 5.398A 5.150 5.399 5.401 5.402	**2 483.5-2 500 MHz** FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.399 5.402	Aeronautical Mobile Video surveillance MSS (2483.5 – 2500 MHz) 2400-2500 MHz Fixed links PTP/PTMP The band 2 400-2 500 MHz is designated for ISM applications (5.150). SRD applications (2 400-2 483.5 MHz)	Unmanned aerial vehicles only Some systems are paired with 1610 – 1626.5 MHz FS paired with 2300-2400 MHz. The band 2483.5-2500 MHz is identified for satellite component of IMT; Res.225 applies. Common international SRD band; see ITU-R Rec.SM.[SRD]

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2483.5 – 2500 MHz:

- Telkom recommends that footnote 5.401 also be added to column 2. This footnote is relevant to South Africa as it requires, amongst others, Swaziland, to obtain agreement from countries not listed in the provision (e.g. South Africa) for using the band for radiodetermination-satellite services.

- The Authority introduced in column 3 the use of “Fixed links PTP/PTMP” in the frequency band 2400 – 2500 MHz paired with 2300 – 2400 MHz. Telkom’s concern regarding this introduction has been expressed is section 3.21.

- The new reference to “SRD applications (2400-2483.5 MHz)” is not applicable to the band 2483.5-2500 MHz and should therefore be deleted.

- Telkom recommends that the reference to ITU-R Rec.SM.[SRD] be changed to ITU-R Rec.SM.1896 (see section 2.9). Further, this reference should also be

added to the bands 2300-2450 MHz and 2450-2483.5 MHz as the common SRD band (as applicable to South Africa) is 2400-2500 MHz.

3.23 Frequency Range 2500 – 2520 MHz

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

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2500 – 2520 MHz:

- The references to “BFWA (2500-2690 MHz)” and “IMT (2500-2690 MHz)” added by the Authority in the band 2520 – 2655 MHz should also be added to this band. Nevertheless, Telkom’s comments in section 3.24 pertaining to these two entries are relevant.
- Telkom’s comments in section 2.5 pertaining to M.1036 is also relevant.

3.24 Frequency Range 2520 – 2655 MHz

MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.412 5.418B 5.418C	MOBILE except aeronautical mobile 5.384A NF9 5.339	IMT2600 MTX (2500 – 2570 MHz) IMT2600 TDD (2570 – 2620 MHz) IMT2600 BTX (2620 – 2690 MHz) BFWA (2500-2690 MHz) IMT (2500-2690 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

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2520 – 2655 MHz:

- The Authority added a reference to “BFWA (2500-2690 MHz)” in column 3 of the draft NRFP-17. Whereas Telkom has not principle objection to this additional information, we wish to express the following:

- The band 2500-2690 MHz has been identified for IMT and, according to the RFSAP, should be used for IMT. Using IMT, a licensee can deploy mobile services, BFWA or any other service within the context of IMT. The intention of adding this reference in the draft NRFP-17 is therefore not entirely clear.
- The same entry has not been added to the frequency bands 2655-2670 MHz and 2670 – 2690 MHz in the draft Table.
- Whereas FIXED is allowed in this band in terms of the frequency allocations for ITU Region 1, there is no FIXED allocation for South Africa in column 2 of the draft Table. Since the band can be used only for IMT, fixed only systems will be problematic.

- The Authority added "IMT (2500-2690 MHz)" in column 3 in the draft Plan. It is not clear why this additional text was added since there are existing entries dealing with the use of this band for IMT.
- As expressed in section 2.2, Telkom recommends that information in columns 3 and 4 be aligned in order to avoid possible confusion.
- As expressed in section 2.5, Telkom recommends that the reference to ITU-R Rec. M.1036 be deleted.

3.25 Frequency Range 2655 – 2670 MHz

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)	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

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2655 – 2670 MHz:

- The references to “BFWA (2500-2690 MHz)” and “IMT (2500-2690 MHz)” added by the Authority in the band 2520 – 2655 MHz should also be added to this band. Nevertheless, Telkom’s comments in section 3.24 pertaining to these two entries are also relevant.

- Telkom’s comments in section 2.5 pertaining to M.1036 is also relevant.

3.26 Frequency Range 2670 – 2690 MHz

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

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 2670 – 2690 MHz:

- The references to “BFWA (2500-2690 MHz)” and “IMT (2500-2690 MHz)” added by the Authority in the band 2520 – 2655 MHz should also be added to this band. Nevertheless, Telkom’s comments in section 3.24 pertaining to these two entries are also relevant.

- Telkom’s comments in section 2.5 pertaining to M.1036 is also relevant.

3.27 Frequency Range 3300 – 3400 MHz

3 300-3 400 MHz RADIOLOCATION 5.149 5.429 5.429A 5.429B 5.430	**3 300-3 400 MHz** RADIOLOCATION 5.149 5.429A 5.429B	Government Services IMT Res. 223 (Rev.WRC-15)	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

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 3300 – 3400 MHz:

- WRC-15 identified this band for IMT in many countries, including South Africa. Telkom supports the use of this band for IMT, noting the ongoing sharing and compatibility studies within WP5D as addressed in Resolution 223 (Rev.WRC-15).

- This band is currently used for Government radars (radiolocation) and impacts the availability of the band for IMT. It is Telkom's understanding that these systems will eventually be migrated from this band. Telkom recommends that the migration of radars from this band be addressed through the updating of the Radio Frequency Migration Regulations.

- The Authority made reference to the IMT Roadmap. However, there is no specific reference in the IMT Roadmap to this new frequency band. The applicability of the Roadmap to this frequency band is therefore debatable and should be reconsidered. If required, the Authority could first make appropriate revisions to the IMT Roadmap.

- The Authority made reference to the RFSAP. No channelling plan for this band has been developed and it is therefore not clear why this reference has been made. Telkom recommends that the Authority first develops a RFSAP for the 3300-3400 MHz band.

- The reference to M.1036 is also inappropriate as this ITU-R Recommendation does not make any reference to this band. Although the inclusion of a channelling plan for this band is being considered within WP5D, this process has not yet been completed and is dependent on, amongst others, the completion of the necessary sharing and compatibility studies as addressed in Resolution 223 (Rev.WRC-15).

- Noting all the above, Telkom suggests that the Authority express intention on the future use of this band for IMT and add an appropriate note in this regard in column 4 of the Table (addressing migration, channelling plan, ITU-R studies, etc.).

3.28 Frequency Range 3400 – 3600 MHz

3 400-3 600 MHz FIXED FIXED-SATELLITE (space-to-Earth) Mobile 5.430A Radiolocation 5.431	**3 400-3 600 MHz** FIXED MOBILE 5.430A NF9	FWA (3400 – 3600 MHz) IMT3500 (3410 – 3490 MHz) IMT3500 (3510 – 3590 MHz)	 Paired with 3510 – 3590 MHz Paired with 3410 – 3490 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 3400 -3600 MHz is also used for BFWA in some SADC countries

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 3400 – 3500 MHz:

- The use of the band 3400-3600 MHz for mobile/IMT has been addressed at WRC-15. WRC-15 decided to change the secondary mobile allocation in Region 1 (i.e. “Mobile”) to a primary allocation (i.e. MOBILE except aeronautical mobile). This amendment has not been reflected in the draft Table and Telkom recommends that this change be made.

- The Authority adopted the TDD channelling plan for IMT in the band 3400-3600 MHz as reflected in the RFSAP (F1 in ITU-R Rec. M.1036). However, this has not been reflected in the table in column 3 where the draft NRFP-17 still refers to the previously proposed FDD plan (i.e. 3410 – 3490 MHz paired with 3510 – 3590 MHz). Section 6.3 in the RFSAP states that: “The National Radio Frequency Plan will be amended to indicate a typical application for TDD.” Telkom therefor recommends that the current FDD references be deleted and be replaced with “IMT3500 TDD (3400-3600 MHz)”. The adoption of the TDD plan in the band 3400-3600 MHz should also be reflected in the Table in NF9.

- Telkom’s comments in section 2.5 pertaining to M.1036 is also relevant.

3.29 Frequency Range 3600 – 4200 MHz

3 600-4 200 MHz FIXED FIXED-SATELLITE (space-to-Earth) Mobile	**3 600-4 200 MHz** FIXED FIXED-SATELLITE (space-to-Earth) NF14	Fixed links (4 GHz) (3600 – 4200 MHz) C-band downlink (VSAT/SNG/PTP links) Fixed services (PTP) (3600-4200 MHz) Fixed-satellite (space-to-Earth) (PTP/VSAT/SNG) (3600-4200 MHz) Broadband Fixed Wireless Access (BFWA) (3600-3800 MHz)	The sub-band 3 600-3 800 MHz could be used for BFWA where frequency sharing with FS PTP and/or FSS is feasible. The channelling arrangement for PTP links in this band is based on ITU-R Recommendation F.635 Annex 1. The sub-band 3 600-4 200 MHz is used for medium and high capacity PTP links and FSS. In the band 3 600-3 800 MHz, BFWA, FS PTP and FSS applications will have to operate on coordinated basis. However, considering the difficulty in
			coordinating ubiquitous user terminals used for BFWA and VSAT, it is proposed that VSAT systems be migrated to the Ku-band.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 3600 – 4200 MHz:

- The Authority added two additional notes addressing the same applications namely “Fixed services (PTP) (3600-4200 MHz)” and “Fixed-satellite (space-to-Earth) (PTP/VSAT/SNG) (3600-4200 MHz)”. These additional notes repeats what are already in the table and as such it is not clear why it was added. Telkom recommends that the new text either be deleted or merged with the existing text.

- According to the draft NRFP-17, the Authority is proposing the use of the band 3600-3800 MHz for BFWA applications in addition to the current FS PTP and FSS applications. Introduction of BFWA in this band is complex and needs to be further assessed. The following issues, amongst others, should be further discussed:

    - It is stated that BFWA can only be used where sharing with FS PTP and/or FSS is feasible and that these three applications will have to operate on a coordinated basis. It is therefore clear that, going forward, these three applications will share the band on a co-primary basis (first-come-first-serve). Allowing BFWA to operate in the band 3600-3800 MHz will restrict the future deployment of FS PTP and FSS systems. If large blocks of

spectrum is assigned over large areas to BFWA, this could severely restrict the deployment of other services in the band.

- Frequency coordination between BFWA, which is generally deployed in a multipoint configuration, and FS PTP and FSS systems could be difficult, especially where large scale BFWA networks are deployed (ubiquitously deployed networks). This is also acknowledged by the Authority in column 4 of the draft NRFP-17. ICASA is therefore advised to first develop the appropriate frequency coordination procedures and sharing criteria to ensure that the future use of this band between these different services and/or applications are clear.

- Although the Authority proposes that the three applications should operate on a coordinated basis, the Authority also proposes that VSAT systems migrate to the Ku-band. Although Telkom supports this in principle, it does seems that BFWA is given higher priority in this band although it is not clear from the information at hand how the sharing and use in this band will be implemented. If VSAT must migrate to higher bands, the Ka-band should also be included.

- The Authority is advised to develop a RFSAP for the band 3600-3800 MHz to ensure that the necessary rules for the shared use of this band between BFWA, FS PTP and FSS are well documented in order to avoid potential disputes between licensees. This will also allow further consultation on the implementation of this complex proposal.

- Telkom also recommends that additional notes pertaining to the planned used of this band for BFWA be added in Note 1 to NF14.

3.30 Frequency Range 5091 – 5150 MHz

5 091-5 150 MHz FIXED-SATELLITE (Earth-to-space) 5.444A AERONAUTICAL MOBILE 5.444B AERONAUTICAL MOBILE-SATELLITE (R) 5.443A 5.443AA AERONAUTICAL RADIONAVIGATION 5.444 5.444A	**5 091-5 150 MHz** FIXED-SATELLITE (Earth-to-space) 5.444A AERONAUTICAL MOBILE 5.444B AERONAUTICAL MOBILE-SATELLITE (R) 5.443A AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.444 5.444A	NGSO MSS feeder links (5091 – 5150 MHz)	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 5091 – 5150 MHz:

- ITU FN 5.444A applies to the FSS (Earth-to-space) service. This FN appears next to this service as well as at the bottom of the table. Telkom recommends that the entry at the bottom of the table be deleted in order to align with ITU Article 5.
- FN 5.443A appears next to the aeronautical mobile satellite (R) service. This FN has been suppressed by WRC-03 and should be deleted from columns 1 and 2.

3.31 Frequency Range 5725 – 5850 MHz

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 5725 – 5850 MHz, as recorded in NF16:

- The use of licence exempt equipment for fixed links is restricted to the frequency band 5725-5850 MHz. It is well known that this equipment can operate well above the limit of 5850 MHz. This then causes harmful interference with PTP links operating in the lower 6 GHz band (5925-6425 MHz).
- Telkom recommends that an additional sentence be added to NF16 to emphasise that the use of this equipment is restricted strictly to below 5850 MHz. All steps should be taken to ensure that the equipment is locked to the frequency band 5725-5850 MHz.

3.32 Frequency Range 5925 – 6700 MHz

5 925-6 700 MHz FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C 5.149 5.440 5.458	**5 925-6 700 MHz** FIXED NF14 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.149 5.440 5.458	Fixed links - Lower 6 GHz (5925-6425 MHz) and Upper 6 GHz (6425-7110 MHz) Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz) ESVs (5925 – 6425 MHz)	Channelling plan for L6 GHz band in accordance with ITU-R Rec. F.383. Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384. Earth Station onboard vessels (ESV) also allowed under FSS.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 5925 – 6700 MHz:

- Telkom recommends that the use of BFWA in the band 5925-6425 MHz be allowed in addition to fixed links. Reference to BFWA should therefore be added to column 3. Compliance with ITU-R Recommendation F.383 should remain. This is an international development and should be allowed in South Africa to ensure more efficient use of this band. Similar additions have been made to the 3.5 GHz and 26 GHz.

3.33 Frequency Range 7075 – 7450 MHz

- The lower 7 GHz frequency band operate within the band 7110 – 7425 MHz. In some places, the L7 band is incorrectly indicated as 7110 – 7443 MHz (own emphasis). Telkom recommends that this discrepancy be corrected. The upper 7 GHz PTP band starts at 7425 MHz.

3.34 Frequency Range 9200 – 9300 MHz

9 200-9 300 MHz EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATIONMARITIME RADIONAVIGATION 5.472 5.473 5.474 5.474D	**9 200-9 300 MHz** EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.474 5.474D	Field Disturbance and Doppler Apparatus (9200 – 9975 MHz) Harbour radars RADARS. Civil and military aeronautical radionavigation e.g. precision airfield approach radars	Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 20115).

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 9200 – 9300 MHz:

- In column 1, the allocations to radiolocation and maritime radionavigation should be separated.

3.35 Frequency Range 10.7 – 11.7 MHz

- The band 10.7 – 11.7 GHz is used on a shared basis for FSS downlink (VSAT/SNG/BSS feeder links), FS PTP links (11 GHz band), App 30B, BSS feeder links and DTH broadcasting (secondary). References to these services do not appear in columns 3 and 4 in the frequency sub-bands 10.7-10.95 GHz, 10.95-11.2 GHz and 11.2-11.45 GHz. References to these services appear only for the sub-band 11.45-11.7 GHz, although not accurately. These errors have possibly creeped in due to splitting the band 10.7-11.7 GHz into four sub-bands.
- Telkom recommends the following additions and modifications to the table (in columns 3 and 4 as appropriate):
    - For the band 10.7-10.95 GHz:
        - This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channelling plan for FS Links are in accordance with ITU-R Rec.F387.
        - The band is also available for FSS Planned services (see Appendix 30B).
        - The band can also be used for BSS feeder links (see 5.484).
    - For the band 10.95-11.2 GHz:
        - This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channelling plan for FS Links are in accordance with ITU-R Rec.F387.
        - This band is also used for FSS (downlink) (VSAT/SNG/BSS feeder links).
        - The band can also be used for BSS feeder links (see 5.484).

- For the band 11.2-11.45 GHz:
  - This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channelling plan for FS Links are in accordance with ITU-R Rec.F387.
  - The band is also available for FSS Planned services (see Appendix 30B).
  - The band can also be used for BSS feeder links (see 5.484).
- For the band 11.45-11.7 GHz:
  - This band is used for Fixed links (11 GHz) (10.7-11.7 GHz). The channelling plan for FS Links are in accordance with ITU-R Rec.F387.
  - This band is also used for FSS (downlink) (VSAT/SNG/BSS feeder links).
  - The band can also be used for BSS feeder links (see 5.484).

3.36 Frequency Range 14.8 – 15.35 GHz

14.8-15.35 GHz FIXED MOBILE Space research 5.339	**14.8-15.35 GHz** FIXED NF14 5.339	Fixed Links (15 GHz) (14.5 – 15.35 GHz)	Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636. The band 14.5-14.8 GHz is part of the APP30A Plan (Feeder Links for BSS) for some SADC countries. Refer to Annex B.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 14.8 – 15.35 GHz:

- The comment regarding the band 14.5-14.8 GHz is not applicable to the frequency band 14.8-15.35 GHz and should be deleted.

3.37 Frequency Range 17.7 – 19.7 GHz

17.7-18.1 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	**17.7-18.1 GHz** FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz)	Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 Annex 1.
18.1-18.4 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519 5.521	**18.1-18.4 GHz** FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 5.519	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz)	Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 Annex 1.
18.4-18.6 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE	**18.4-18.6 GHz** FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz)	Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 Annex 1.
18.6-18.8 GHz	**18.6-18.8 GHz**		
EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	EARTH EXPLORATION-SATELLITE (passive) FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.522B Space research (passive) 5.522A	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz) Passive Sensing	Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 Annex 1
18.8-19.3 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.523A MOBILE	**18.8-19.3 GHz** FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.523A	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz)	
19.3-19.7 GHz FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE	**19.3-19.7 GHz** FIXED NF14 FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E	Fixed Links (18 GHz) (17.7 – 19.7 GHz) BSS Feeder Links (17.7 – 19.7 GHz)	Channelling plan for 18 GHz band in accordance with ITU-R Rec. F.595 Annex 1.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 17.7 – 19.7 GHz:

- It is indicated that the band 17.7-19.7 GHz can be used for BSS feeder links. However, it is only the sub-bands 17.7-18.1 GHz and 18.1-18.4 GHz that could be used for BSS feed links (see 5.516 and 5.520 respectively for specific conditions). There is no FSS (Earth-to-space) allocation in the bands 18.4 GHz to 19.3 GHz, which is necessary for feeder links (i.e. uplinks). In the band 19.3-19.7 GHz, the FSS (Earth-to-space) is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service.

- Telkom recommends that the BSS feeder link references in the bands 18.4-19.7 GHz be deleted. It is also recommended that the band reference for BSS feeder links in the frequency bands 17.7-18.4 GHz be limited to this range.

3.38 Frequency Range 19.7 – 20.2 GHz

19.7-20.1 GHz FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A Mobile-satellite (space-to-Earth) 5.524	**19.7-20.1 GHz** FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A	GSO/FSS	
20.1-20.2 GHz FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A	**20.1-20.2 GHz** FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A		The band 19.7-20.2 GHz is identified for HDFFS; Res.143 applies.
MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528	5.525 5.526 5.527 5.528		

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 19.7 – 20.2 GHz:

- This frequency band is allocated exclusively for FSS (space-to-Earth); there are no fixed terrestrial services operating in this band. The band has also been identified for HDFSS (5.516B).

- Satellite services are available in South Africa, which operate in this frequency band and ICASA has licenced operators to provide services in the band. This band is generally referred to as Ka-band (downlink).

- Telkom recommends that the NRFP-17 be updated to reflect in column 3 the typical application of FSS terminals (uncoordinated) in the band 19.7-20.2 GHz. Telkom recommends that FSS can be deployed on an uncoordinated basis (no need to licence individual earth station terminals) in this band since frequency coordination with fixed terrestrial services is not required.

- The return band for Ka-band satellite services (Earth-to-space) is 29.5-30 GHz (see comments in section 3.43).

- Telkom also recommends that the Authority establishes the appropriate sharing and coordination procedures to address the use of satellite services in the Ka-band. This should include both coordinated and uncoordinated use. Similar procedures have been developed by CRASA, which could be used as a basis for development of national procedures. These procedures should be added to the Radio Frequency Spectrum Regulations.

3.39 Frequency Range 21.4 – 22 GHz

21.4-22 GHz FIXED MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.530D	**21.4-22 GHz** FIXED NF14 MOBILE BROADCASTING-SATELLITE 5.208B 5.530A 5.530B 5.530D	Fixed Links (23 GHz) (21.2 – 23.6 GHz) Fixed links - 23 GHz (21.2-23.6 GHz or 22.0-23.6 GHz)	Channelling plan for 23 GHz band in accordance with ITU-R Rec. F.637 Annex 1 or Annex 3. The use of BSS in this band is subject to the provisions of Res.525. BSS systems operating in this band over SADC countries are not expected within the foreseeable future.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 21.4 – 22 GHz:

- The Authority made reference to Resolution 525, which was the interim procedures for introducing BSS in this band. However, this Resolution has been abrogated by WRC-12. Telkom recommends that the Authority make reference to Resolutions 552, 553 and 555. All three these Resolutions were updated at WRC-15.

3.40 Frequency Range 25.25 – 27 GHz

- The Authority added a reference to BFWA operating in the band 24.5-26.5 GHz. Telkom recommends that the same reference be added to the sub-bands 25.25-25.5 GHz and 25.5-27 GHz.

3.41 Frequency Range 27.5 – 28.5 GHz

27.5-28.5 GHz FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE 5.538 5.540	**27.5-28.5 GHz** FIXED 5.537A NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 5.538 5.540	Fixed Links (28 GHz) (27.5 – 29.5 GHz), LMDS (27.82 – 28.35) Base to Subscriber	Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2. The band 27.5-27.82 GHz is identified for HDFFS; Res.143 applies. The band 27.5-30 GHz may be used by the FSS for BSS feeder links.

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 27.5 – 28.5 GHz:

- The Authority added the use of LMDS in the band 27.82-28.35 GHz. Although this is an existing application as per NRFP-13, Telkom recommends that the Authority further engage the sector on the shared use of this band for LMDS and other services. Issues to be addressed include sharing with FS links and FSS earth stations, coordination procedures, licensing requirements, band plans for LMDS, use of HDFSS (coordinate or uncoordinated), etc.

- The Authority proposed in NF18 that the return band will be changed to the frequency band 31.225-31.3 GHz (from current 29.1-29.25 GHz) due to sharing issues. It is not clear if this decision is final or if and when the Authority will consider the proposed change. Also, if there are existing systems these will have to be migrated and the Radio Frequency Migration Plan will therefore have to be updated.

- Considering all the complexities involved in this matter, Telkom recommends that the Authority considers the development of a RFSAP for this band at which time all the issues could be addressed through open and transparent consultation.

- As a minimum, the return band for the LMDS should be added to column 4 of the NRFP-17.

3.42 Frequency Range 29.1 – 29.5 GHz

29.1-29.5 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	**29.1-29.5 GHz** FIXED NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A 5.540	Fixed Links (28 GHz) (27.5 – 29.5 GHz)	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 29.1 – 29.5 GHz:

- Telkom recommends that the Authority add the necessary information in column 4 (i.e. references to channelling plan, use of the band 27.5-30 GHz for BSS feeder links, HDFSS bands, etc.).

3.43 Frequency Range 29.5 – 30 GHz

29.5-29.9 GHz FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	**29.5-29.9 GHz** FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 5.540		The band 29.46-30.0 GHz is identified for HDFFS; Res.143 applies.
29.9-30 GHz FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542	**29.9-30 GHz** FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540		

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 29.5 – 30.0 GHz:

- In line with Telkom's comments in section 3.38 pertaining to Ka-band satellite services, Telkom recommends that the band 29.5-30 GHz also be indicated for VSAT applications (uplink) on an uncoordinated basis.

3.44 Frequency Range 57 – 66 GHz

This frequency range has been earmarked for licence exempt use as per Government Gazette 40436 dated 22 November 2016 (i.e. amendment to Radio Frequency Spectrum

Regulations). Telkom recommends that the necessary reference to the Radio Frequency Spectrum Regulations, as amended, be added to all frequency bands within the range 57 – 66 GHz.

3.45 Frequency Range 71 – 74 GHz

71-74 GHz	**71-74 GHz**		
FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	FIXED NF14 FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	Fixed Links (80 GHz) (71 – 76 GHz) Government use Fixed links (71-76 GHz)	Paired with 81 – 86 GHz. Radio Frequency Spectrum Regulations Amendments, (Government Gazette Number 40436, 22 November 2016)

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 71 – 74 GHz:

- The comment “Government use” is not clear and need further clarification. The 80 GHz band has been made available for fixed links through the RFSR amendment as indicated. However, these regulations does not specify any “Government use” per se.

3.46 Frequency Range 200 – 209GHz

200-202 GHz EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	**200-202 GHz** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A		
202-209 GHz EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	**202-209 GHz** EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	Passive Sensing	

Telkom wishes to make the following comments and/or recommendations pertaining to the frequency range 200 – 209 GHz:

- Telkom notes that the frequency range 200 – 209 GHz has been split into two ranges namely 200-202 GHz and 202-209 GHz in the draft NRFP-17. Keeping with the format used throughout the NRFT-17, Telkom recommends that these two frequency bands be merged into one band.

3.47 Amendments to section 6 of the draft NRFP-17 (ITU Radio Regulations Footnotes)

Apart from the changes to ITU Footnotes proposed in previous sections, Telkom recommends the following changes to the ITU Footnotes (FN) in section 6 of the draft Table:

- FN 5.54: this FN appears twice in section 6 of the Plan. Telkom recommends that the second entry be deleted as it is not in line with the ITU Radio Regulations Article 5.
- FN 5.68: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.87A: At the end of this FN there is an additional paragraph “The examination of frequency assignments….Regional Administrative Conference (Rio de Janeiro, 1988)”. The paragraph is part of FN 5.89 and should be deleted from FN 5.87A.
- FN 5.111: There is an editorial error in this FN; the FN should read: “…must be confined in a band of ± 3 kHz about this frequency.”
- FN 5.134: In Article 5 of the Radio Regulations there is a footnote to the reference to Resolution 517, Telkom recommends that this footnote also be added to the Table to be complete.
- FN 5.138A: This FN was suppressed by WRC-15 and should therefore be deleted from the table and section 6 of the Plan. Although this change does not appear in the WRC-15 Final Acts, it is reflected in the Radio Regulations edition of 2016.
- FN 5.139: This FN was suppressed by WRC-15 and should therefore be deleted from the table and section 6 of the Plan. Although this change does not appear in the WRC-15 Final Acts, it is reflected in the Radio Regulations edition of 2016.
- FN 5.141C: This FN was suppressed by WRC-15 and should therefore be deleted from the table and section 6 of the Plan. Although this change does not appear in the WRC-15 Final Acts, it is reflected in the Radio Regulations edition of 2016.

- FN 5.142: this FN was updated at WRC-12 and should be updated in section 6 of the Plan.
- FN 5.143B: this FN was updated at WRC-12 and should be updated in section 6 of the Plan.
- FN 5.143E: This FN was suppressed by WRC-15 and should therefore be deleted from section 6 of the Plan (it has been deleted from the draft Table). Although this change does not appear in the WRC-15 Final Acts, it is reflected in the Radio Regulations edition of 2016.
- FN 5.150: this FN should be separated from FN 5.149A.
- FN 5.167: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.218: There is an editorial error in this FN; the FN should read: "…any individual transmission shall not exceed ± 25 kHz."
- FN 5.288: this FN was updated at WRC-15 and should be updated in section 6 of the Plan. Alternatively, this FN may be deleted as it is not relevant to Region 1.
- FN 5.300: this FN should be separated from FN 5.296.
- FN 5.319: this FN should be separated from FN 5.317A.
- FN 5.388A: this FN was updated at WRC-12 and should be updated in section 6 of the Plan.
- FN 5.428: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.429: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.430: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.

- FN 5.432A: This FN is not relevant to Region 1 and should be deleted from section 6 of the Plan.
- FN 5.433A: This FN is not relevant to Region 1 and should be deleted from section 6 of the Plan.
- FN 5.440: There is an editorial error in this FN; the FN should read: "…within the limits of ± 2 MHz of these frequencies…"
- FN 5.460B: This FN was adopted at WRC-15 and is applicable to Region 1. Whereas the Authority added the FN to the draft Table (columns 1 and 2), the FN was not added to section 6 of the draft Table. Telkom recommends that it be added.
- FN 5.468: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.471: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.509A: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.511A: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.511C: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.543A: this FN was updated at WRC-15 and should be updated in section 6 of the Plan.
- FN 5.560: this FN should be separated from FN 5.559B.

3.48 Amendments to section 7 of the draft NRFP-17 (List of frequency bands for Maritime services)

Telkom assume that SAMSA (South African Maritime Safety Authority) will make the necessary proposals to this section of the draft NRFP-17.