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

Dear Mr Makgotlho,

RE: TELKOM'S WRITTEN SUBMISISON ON THE DRAFT FREQUENCY MIGRATION REGULATION AND RADIO FREQUENCY MIGRATION PLAN

Telkom thanks the Authority for the opportunity to provide comments on the draft Frequency Migration Regulations ("**FMR**") and Frequency Migration Plan ("**FMP**") as published in Government Gazette No. 35598 (Notice 606 of 2012) of 17 August 2012.

Telkom's comments pertaining to the draft FMR and FMP are attached. Moreover, Telkom requests an opportunity to make oral representation at the public hearings.

Yours sincerely

DR RICHARD MAJOOR
ACTING GROUP EXECUTIVE: REGULATORY AFFAIRS

TELKOM'S SUBMISSION ON DRAFT FREQUENCY MIGRATION REGULATION AND FREQUENCY MIGRATION PLAN AS PUBLISHED 17 AUGUST 2012 IN GOVERNMENT GAZETTE No. 35598

(NOTICE 606 OF 2012)

1 INTRODUCTION

Telkom SA Limited ("**Telkom**") welcomes the opportunity to provide comments on the proposed draft Frequency Migration Regulations ("**FMR**") and Frequency Migration Plan ("**FMP**") as published in Government Gazette No. 35598 (Notice 606 of 2012) of 17 August 2012. In Telkom's written submission we will collectively refer to these two documents as the "**Consultation Document**".

The submission is structured as follows: Section 2 presents general comments pertaining to the Consultation Document. This is followed by specific comments on the draft FMR and FMP in Sections 3 and 4, respectively. Section 5 concludes the submission with proposed editorial amendments to the Consultation Document.

Telkom's main concerns with regard to the Consultation Document can be summarised in the following points:

- **Drafting and Structure:** In general, the Consultation Document is vague and unstructured and a substantial review of the document is necessary. In particular, the end-to-end process of migration is not clear.

- **Unintended consequences of migration**: Undue migrations may lead to inflated service prices, since asset replacement costs incurred by operators will be ultimately factored into the price of services offered by the operators. Moreover, the provision of services may be disrupted during the migration period.

- **Undue migrations:** Telkom does not support migration proposals that present no social, technical or economic benefits to South Africans as this contradicts the purpose of the draft FMP which aims to manage "*spectrum efficiently to the benefit of all South Africans*"

Telkom trusts that our proposals and constructive criticism will assist in the favourable review of the Consultation Document.

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2 GENERAL COMMENTS

2.1 Overall drafting and structure of the Consultation Document

Overall, in Telkom's view, the Consultation Document is inadequate and to an extent vague in most respects. Accordingly, substantial amendment will be required to ensure that there is no ambiguity pertaining to the implementation of the FMR and the FMP.

Firstly, the draft FMR and FMP are contained as Part 1 and Part 2 of the Consultation Document, respectively. However, it is not clear if these two documents will eventually be prescribed separately or whether the FMP will be prescribed as part of the FMR or will it be included in a future update of the National Radio Frequency Plan ("**NRFP**"). It is also noted in section 3.2 of the FMP that the "*draft frequency migration regulation is attached to the draft plan*", which is factually incorrect. In Telkom's view, the FMP should be a sub-set of the NRFP, according to the definition of "*radio frequency plan*" as contained in the Electronic Communication Act No. 36 of 2005 ("**ECA**").

Secondly, it is very unfortunate that neither the draft FMR nor the FMP contains a flowchart or general description explaining the overall end-to-end process envisaged by the Authority to give effect to frequency migration and/or re-farming. For example, whereas the FMR addresses the issue of process for radio frequency migration in section 4, it only states that the Authority shall "*initiate a process of radio frequency migration*" (own emphasis) under the listed conditions, while the actual process itself is not further explained. See section 3.2 below for further comments on the matter of process.

Thirdly, the general structure and flow of the Consultation Document, in particular the FMP, is inadequate and requires redrafting for the following reasons, amongst others:

- The same issues are addressed in various sections throughout the document (e.g. "process" is addressed in sections 2.3.1 and 3.2 of the draft FMP; "spectrum licence duration" is addressed in sections 2.1.4, 2.3.1 and 3.3.1, amongst others).
- Some sections or paragraphs are seemingly unrelated to the particular topic being discussed (e.g. the "process" being given in section 2.3.1 of the FMP dealing with spectrum rights).
- In some cases statements are made without expressing the relevance of these to the FMR or FMP (e.g. section 2.1.3 of the FMP dealing with licensing framework).
- Several unsubstantiated statements are made in the Consultation Document (e.g. section 3.3.3 pertaining to the technology life-cycle).
- Numerous factually incorrect statements are made (e.g. the assignments to Neotel, Cell-C and others in section 4.11 of draft FMP).
- The general lack of stipulation the relation between the NRFP and the FMP.
- In several instances cross-references are incorrect and need to be fixed.

These issues are highlighted in greater detail in the various sections below.

2.2 The Requirement for frequency migration and re-farming

Frequency migration and re-farming is driven by the ever increasing need to improve existing services or to introduce new services for the benefit of all South Africans. Hence, all migration/re-farming proposals should endeavour to achieve some form of technical, social or economic benefit for South Africans. This is supported in ITU-R Recommendation SM.1603-1.

A forced migration from a particular band for which no demand exists, or where demand is not sure, may result in unused spectrum. This is highly inefficient use of spectrum and contradicts the purpose of the draft FMP which aims to manage spectrum *"efficiently to the benefit of all South Africans*". The Authority further acknowledges unwarranted migration in section 4.3 of the FMP, which states that candidate bands for migration should be considered, "*If there is a global trend and perceived economic benefit in migrating the current users to accommodate new services*." Moreover, undue migrations will negatively impact operators for the potentially exorbitant migration costs. As a result, Telkom does not support migration proposals that present no social, technical or economic benefits to South Africans.

The potential benefits of migration are closely linked to the availability of suitable equipment that can be deployed in the specified frequency band. However, for many migration proposals, the existence of technologies to be deployed in the respective frequency bands is not yet evident (several examples of allocations that are made "*depending on the availability of equipment*").

2.3 Alternative frequency band recommendations

In general, migration proposals should also include suggestions for alternative frequency bands. This will provide certainty in the migration process thus mitigating possibilities for delay. However, certain proposals outlined in Table 3 of the FMP do not include suggestions for alternative frequency bands that may be used; it is also not clear if the intention is to identify these during the development of the RFSAPs. Telkom therefore respectfully requests the Authority to review Table 3 in order to address this matter. Moreover, the following non-exhaustive list of guiding principles may be used for the identification of alternative frequency bands:

- A licensee should not be commercially disadvantaged having migrated from one band to another.
- The bands should have similar technical characteristics to the band that is to be migrated from or at least be able to support the relevant service requirements.
- The proposed band should have a harmonised channelling arrangement, where applicable.
- Equipment should be readily available for use in the new frequency band.

2.4 Astronomy Geographic Advantage Act 2007 (Act No. 21 of 2007)

Telkom notes the fact that there is no reference in either the FMR or the FMP to the issue of radio frequency migration that will be required as a result of astronomy developments in South Africa in general and the SKA (Square Kilometre Array) developments in the Northern Cape in particular. Although these matters will be addressed through regulations prescribed under the Astronomy Geographic Advantage ("**AGA**") Act, and whereas the objective should not be to replicate the specifics of these regulations, the issues are related and need referencing in either the FMR or the FMP to the extent necessary.

3 DRAFT FREQUENCY MIGRATION REGULATIONS

3.1 Section 3 of FMR ("Principles")

3.1.1 Alignment with SADC FAP

According to sub-section 3(3), the National Radio Frequency Plan ("**NRFP**") must be consistent with both the ITU Radio Regulations and the SADC FAP. With regard to alignment with the SADC FAP, Telkom wishes to state that, although we should aim for this to the greatest extent possible, such alignment will not always be feasible and is also not a necessity in all cases. During the development of the SADC FAP 2010, it was clear that the spectrum use and requirements of South Africa is unique in many instances. For example, in South Africa we extensively use many point-to-point frequency bands in particular the higher frequency ranges, there exists a greater need for frequency bands to provide mobile services (IMT, PMR/PAMR, Trunking, etc.), radio astronomy developments, many scientific endeavours, etc. Where there was no conflict in use, SADC members adopted the South African allocations although this was not always possible. In some cases, the uniqueness of spectrum use in South Africa was not reflected (principle of majority use prevailed). Therefore, full alignment with the SADC FAP is not achievable and in certain instances unwarranted.

3.1.2 Migration of allocations perplexed

With reference to sub-section 3(4), the principle of "*migration of an allocation*" which is not aligned with the NRFP is perplexing. Amendments to the table of frequency allocations are primarily made to implement World Radiocommunication Conference ("**WRC**") changes by either adding new or suppressing existing allocations. Once the NRFP has been amended, assignments which are no longer in line with the table of frequency allocations could then be migrated. Therefore, changes in allocation may lead to the migration of assignments (users); allocations *per se* are not "migrated". Telkom's comments made in section 2.1 above pertaining to the blurring of NRFP updates and the FMP also refers.

3.1.3 Compensation

In terms of sub-section 3(5), it is stated that the user shall not be entitled to be compensated by the Authority for the costs of migration. The issue of compensation for migration must however be considered on a case-by-case basis. Whereas in principle Telkom agrees that compensation is not a guaranteed entitlement, there may be cases where compensation may be required based on the principle of expropriation of property, as envisaged in Section 25 of the Constitution. It should therefore not be ruled out completely. This subsection must rather be qualified for those cases where compensation may be constitutionally warranted. In addition, operators should be able, on a case-by-case basis, to seek compensation on the grounds of financial impairments to their network equipment as a result of forced migrations.

Furthermore, compensation may not necessarily take the form of a monetary payment. For example, Telkom urges the Authority to consider elimination of payment of spectrum fees during

the migration period where users have committed to migrate from a particular frequency band within a specified period, in order to use the savings in spectrum fees as a subsidy towards the cost of migration. This will also eliminate the double payment of spectrum fees where dual illumination may be required.

3.1.4 Economic and technological lifecycles

With regard to the consideration of "economic life time of equipment" as referred to in sub-section 3(6), Telkom wishes to make the following comments.

Economic Useful Life is defined as the estimated period of time over which it is anticipated an asset may be profitably used for the purpose intended.

Technological Useful Life is defined as the period of time over which the asset is the latest available technology and thereafter due to technological advancement becomes redundant from a technological perspective.

With reference to the definitions above, it is relatively easy to assess the technological useful life of an asset; however, it is important to stress that the assessments of the useful economic life and residual value of a fixed asset are extremely subjective. Consequently, if the Authority does not prescribe definitive time–frames for migration, this could potentially lead to inadvertent disagreements between spectrum users and the Authority.

In addition, in terms of the International Financial Reporting Standards (IFRS) 16, (originally known as International Accounting Standard (IAS) 16) – Companies must annually review the useful life of all assets and if the asset is still economically viable (i.e. the asset can still generate revenue) the economic useful life of that asset should be extended. With reference to this international accounting standard, companies are advised to extend the economic useful lives of assets; this requirement is in direct conflict with what the Authority is proposing in terms of replacement of assets.

If the Authority wishes to minimise the cost of migration then it should not only consider the duration of the license and the economic life of impacted equipment, but more importantly it should consider whether the migration will have an economic and or social benefit to consumers. Any pre-mature or unnecessary migration and subsequent asset replacement costs that are incurred by the operator will ultimately raise capital costs and may impact consumer prices.

3.2 Section 4 of FMR ("Process of Radio Frequency Migration")

According to section 4, the Authority shall initiate a "*process of radio frequency migration*" in the circumstances as listed which includes, amongst others, as specified in the FMP itself. This section however fails to describe the overall end-to-end process that will be followed. According

to sections 5 and 6 of the FMR, it seems that a two step process (as also supported in section 3.2 of the FMP) will generally be followed namely the preparation of a Radio Frequency Spectrum Assignment Plan ("**RFSAP**") and the amendment of the relevant radio frequency spectrum licence/s. However, the purpose and application of the FMP is not clearly defined in this process.

Furthermore, whereas the FMP in section 2.3.1 refers to a "*process for spectrum migration*", which shall include, amongst others, "*a consultation process*", it is not clear when and how this will be implemented. Nevertheless, it would seem that the actual migration or re-farming will be done on a case-by-case basis, probably through the development of the RFSAP. Telkom fully supports the case-by-case consideration of migration, considering the tremendous complexities associated with such process.

Based on the Consultation document, it is arguable that the overall frequency migration process would include, amongst others, updating of the NRFP, the development of the FMP, development of the RFSAP, amendment of spectrum licences, issuing of a notice to users to migrate (see section 6.1 of the FMR), the process of execution of the migration, and so forth[1]. The lack of clarity in the overall process is further exacerbated by the removal of a clear demarcation between the NRFP and the FMP as well as the processes for updating and/or preparing these two documents noting that, according to the ECA, the FMP is part of the NRFP. In Telkom's view, certain proposals for "migration" as per the FMP should rather be dealt with under the standard process of updating the NRFP, which raises questions about the overall process. Also, the bridge between the FMP and RFSAP is not clear since the FMP (Table 3) is "*proposed*" and "*for consideration*".

Telkom therefore urges the Authority to elaborate on this section to ensure that there is no ambiguity in how the process of migration will be implemented end-to-end.

3.3 Section 5 of FMR ("Preparation of a Radio Frequency Spectrum Assignment Plan")

The application or implementation of the RFSAP in the overall frequency migration process is not entirely clear and requires further elaboration. In particular, the relationship between the FMP and the RFSAP need further clarification considering that, key elements such as the migration process, the new bands to which users will migrate and the time scale for migration will be included in the RFSAP and not in the FMP. Also, the use of the word "*must*" in sub-regulation 5(1) seems inappropriate.

In Telkom's understanding, based on the guidance of the FMP, a RFSAP will be developed on a case-by-case basis for each frequency band where migration is to be implemented.

[1] An example of a typical flowchart for the overall re-farming process in Europe is contained in ECC Report 16 (Re-farming and secondary trading in a changing radiocommunication world).

4 COMMENTS ON DRAFT FREQUENCY MIGRATION PLAN

4.1 Comments on Section 1 (“Introduction”)

4.1.1 Sub-section 1.1 (“Purpose”)

The purpose of the FMP is not clear in the context of the overall end-to-end migration process. Whereas it seems that the FMP contains “proposals” for migration, the specific migrations to be implemented, on a case-by-case basis, will be done through the development of RFSAPs. This must be clarified.

4.1.2 Sub-section 1.2 (“Definitions”)

The overall purpose of this section is questionable. Whereas the Authority goes to great length to define “*Radio Frequency Migration*” and “*Spectrum re-farming*”, and to an extent also “*in-band migration*”, its application and use in the FMR and FMP is not always clear. It is also not clear why these terms are defined in the FMP and not in the FMR, which governs the migration process. Although the term re-farming is very broad, as also defined in the draft FMP, it is noted that this term is used only in the context of the 900 MHz, 1800 MHz and 2100 MHz mobile bands.

Telkom also recommends that the Authority considers using the ITU definition for frequency redeployment or re-farming, as defined in Recommendation ITU-R SM.1063-1 namely:

> “*Spectrum redeployment (spectrum refarming) is a combination of administrative, financial and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band. The frequency band may then be allocated to the same or different service(s). These measures may be implemented in short, medium or long time-scales*”.

It is also not clear from this section what the role of the Authority *vis-à-vis* the spectrum user is in terms of spectrum re-farming considering that spectrum licences should generally be technology neutral, which allow users the opportunity to implement technology changes (re-farming) within existing assignments without the intervention of the Authority (section 2(b) of the ECA). This aspect needs further explanation.

Also, the repetition of the definitions of “*allocation*”, “*assignment*” and “*allotment*” seems unnecessary considering that these are defined in the NRFP 2010.

4.1.3 Sub-section 1.2.2 ("Defining Spectrum Migration")

> ***"Radio Frequency Spectrum Migration"*** *means the movement of users or uses of radio frequency spectrum from their existing radio frequency spectrum location to another.*

Telkom does not support the proposed definition of Radio Frequency Spectrum Migration, in particular the adding of the concept "uses". The term "uses" is introduced in the above definition in order to allow spectrum migration to encompass re-farming of spectrum within specific bands to other technologies and in-band migration. However, the proposed definition does not address the re-farming of spectrum at a particular spectrum location; the definition is specifically geared towards scenarios where migrations to new spectrum locations occur. As a result, the proposed definition does not achieve the intended objective of encompassing re-farming.

Although the terms re-faming and migration are inter-related, the Authority draws a clear distinction between them in the FMP. For example, an extract from Table 3 states, "*No migration planned, spectrum re-farming when deemed necessary*". Telkom therefore proposes the following revision to the definition of Radio Frequency Spectrum Migration:

> ***"Radio Frequency Spectrum Migration"*** *means the movement of users ~~or uses~~ of radio frequency spectrum from their existing radio frequency spectrum location to another.*

In addition the term "uses" in the context of the above definition refers to an allocation. The principle of migration of an allocation (from one band to another) is not supported (see section 3.1.2 for further comments). Also, by not adding the concept of "uses" in this definition aligns with the use of the term in the ECA.

4.1.4 Sub-section 1.2.3 ("Defining Spectrum Re-farming")

> *"Radio Frequency Spectrum Re-farming" means the process by which the use of a Radio Frequency Spectrum band is changed following a change in allocation, this may include change in the specified technology and does not necessarily mean that the licensed user has to vacate the frequency.*

The definition proposed implies that a "*change in allocation*" is a prerequisite for re-farming. This is incorrect as licensees may re-farm a particular band to introduce new technologies, whilst the allocation to that band remains unchanged. A typical example is Cell-C's use of the 900 MHz band which is allocated to the mobile service. Initially, the band was used for GSM and later re-farmed to introduce 3G services. In this case, the re-farming was initiated by the need to deploy a more advanced technology as opposed to a change in allocation of the band. A very useful diagram showing examples of the various re-farming processes is contained in ECC Report 16 as indicated below:

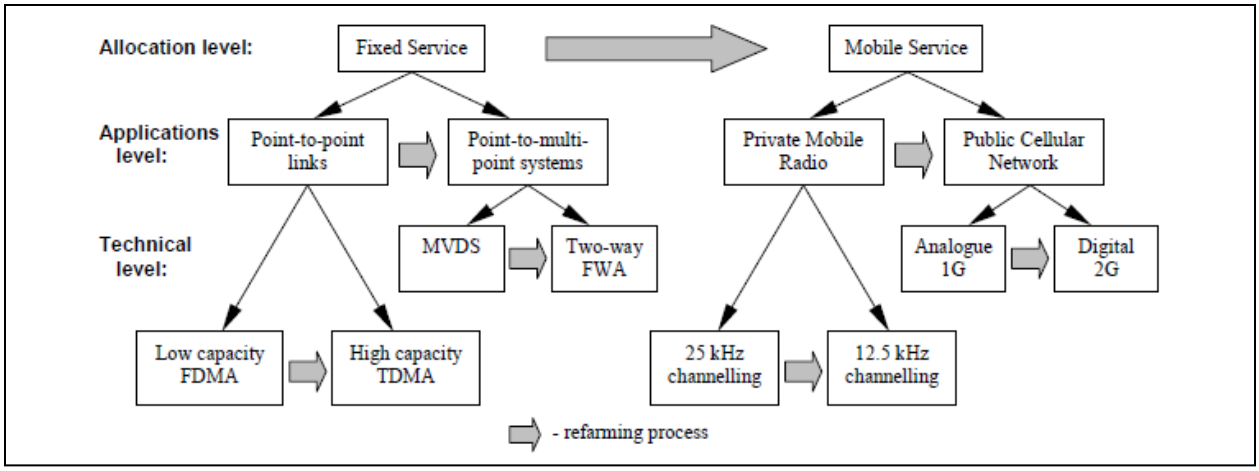

Figure 1: Various re-farming processes

Telkom therefore proposes the following revision to the definition of Radio Frequency Re-Farming:

> *"Radio Frequency Spectrum Re-farming" means the process by which the use of a Radio Frequency Spectrum band is changed ~~following a change in allocation~~, this may include change in the specified application or technology and does not necessarily mean that the licensed user has to vacate the frequency.*

Furthermore, as also explained above, changes to allocations are better addressed through the updating of the NRFP in accordance with section 34(5) of the ECA.

4.2 Comments on Section 2 ("Review of Legislation and Regulations")

4.2.1 Sub-section 2.1.3 ("Chapter 3 – Licensing Framework")

It is not clear why this sub-section is included in the draft FMP. Not only does it states the obvious from the ECA, there is also apparent linking with the FMP. The relevance of this section in relation to the FMP must therefore be stipulated.

4.2.2 Sub-section 2.1.4 ("Spectrum Licence Duration")

The intention and/or meaning of this statement must be clarified. Firstly, this sub-section seems unrelated to the topic under discussion i.e. section 2.1 addresses the review of legislation as it relates to migration whereas spectrum licence duration is not addressed in the ECA (also evident since there is no reference to any provision of the ECA).

4.3 Sub-section 2.3.1 ("Radio frequency spectrum rights")

The statement "*The spectrum licence is currently valid for one year only and a spectrum assignment can be revoked at any time*" should be clarified since it does not reflect reality. Whereas this statement is seemingly founded on Regulation 15(2) of the Radio Frequency Spectrum Regulations, it is clear from Regulation 15(2) that dates of validity other that annually could be stipulated in either regulation, an ITA or in a licence. Also, the main purpose of Regulation 15(2) is to align the dates of validity of spectrum licences. There is also an expectation that the spectrum licence will be renewed ("renewable") based on the payment of the spectrum fee.

The paragraph dealing with "*The process for spectrum migration shall include the following:*" is out of context as it neither relates to the topic of "*radio frequency spectrum rights*" nor to the main topic of "*Review of Legislation and Regulations*". Telkom therefore recommends that this paragraph be moved to an appropriate section, possibly to Section 3 ("*Principles Governing Frequency Migration*") and in particular sub-section 3.2 ("*Process*").

In addition to the movement of this paragraph, Telkom also recommends that the list be expanded to also include the assessment of technical, economic and social benefits derived from both the incumbent and proposed new services/applications to be provided. This is line with Recommendation ITU-R SM.1603-1 stating that technical, economic and social benefits must be derived from the redeployment of spectrum. Technical, economic and functional efficiency is also criteria used by the Authority in the application for the transfer of a radio frequency spectrum licence (see Form C in the Radio Frequency Spectrum Regulations).

4.4 Comments on Section 3 ("Principles governing Frequency Migration")

4.4.1 Sub-section 3.1 ("Identification of Bands [which] are subject to Frequency Migration")

It is not clear why there is a "*hierarchy*" associated with the identification of frequency bands to be migrated; either migration is required or not. Ultimately, the need for migration will stem from the NRFP, which was developed based on decisions taken at either a WRC or a Regional Radiocommunications Conference (both has equal status if the particular Regional Conference is relevant to South Africa) or the SADC FAP. In the event that a decision to migrate is taken on the "Fourth Level", such need for migration will have equal status compared to other migrations. This matter needs further clarification.

4.4.2 Sub-section 3.2 ("Process")

> The process of frequency migration is carried out in a manner consistent with the radio frequency spectrum regulations and the generic process is described in the draft frequency migration regulation that is attached to this draft plan. The key processes are:
>
> - Preparation of a Radio Frequency Spectrum Assignment Plan
> - Amendment of a Radio Frequency Spectrum Licence

Whereas the RFSAP will contain the details pertaining to new frequency band, time frames, etc, Telkom would recommend a third key process namely the "migration implementation plan". Using the migration of analogue to digital as an example, as well as recognising the failure in execution of migration under SABRE, this third step is key in ensuring that the migration is successfully implemented. Telkom would recommend the creation of frequency migration committees, similar to the 1800 MHz committee that was established for such purpose. In some case it would be a simple and bi-lateral process; in other cases it will be very complex involving many users (e.g. 450 MHz). See also section 3.2 for more information concerning the process.

4.4.3 Sub-section 3.3.1 ("Duration of the radio frequency spectrum licence")

Telkom agrees with the statement in section 3.2 that the time frame for migration is a critical matter and this must be carefully considered taking into account all relevant factors. That being said, the duration of a spectrum licence is then identified as one of the factors to be considered in assessing the time frame for migration. In determining this critical element of migration (i.e. time frame), a very simplistic statement is made in section 3.3.1 namely that "*The radio frequency spectrum licences in South Africa are in principle granted for a one year period, the multi-year licences will be restricted so that any migration will not fall within the period of a multi-year licence*" (own emphasis). Through making this basic statement, and in the absence of any further elaboration on, or discussion of this factor whatsoever, it would seem that the Authority have come to the conclusion that the duration of a spectrum licence is generally not an issue for consideration since spectrum licences are granted for a one year period only. Telkom rejects this notion in its entirety as it goes against both the principle of regulatory certainty and moreover objects (d) and (z) of the ECA, which speaks to encouraging investment in infrastructure and promoting stability in the ICT sector, respectively. Internationally, it is common practice that spectrum licences are of 10, 15 or 20 year duration – and there is no reasonable grounds to presume the situation should be different in South Africa. It is however acknowledged that for certain licences, for example PMR, the licence duration could be substantially less.

Telkom considers the renewal of spectrum licenses to be perpetual in nature – subject to various criteria e.g. meeting the obligations of the licence, payment of the annual spectrum fee etc. However, Telkom acknowledges that in certain cases, despite a licensee's compliance with the terms and conditions of the licence, it may be in public interest that the licence is withdrawn

or migration takes place; and it is for this reason that we advocate a frequency migration process – which will cater for such events.

If the Authority is to persist in its view that spectrum licences are not perpetual, however of annual duration, then Telkom wishes to firmly note that the withdrawal of such licences on a technicality without due process and just cause will amount to an administrative injustice. Moreover, the undue withdrawal of spectrum licenses poses no social, economic or technological benefit to the people of South Africa.

This matter is further compounded by the second half of the sentence under section 3.3.1, which states that, for multi-year licences, any migration will at least not fall within this period (assumed to be 5 years based on Regulation 15(3) of the Radio Frequency Spectrum Regulations). It is Telkom's understanding that the principle of a multi-year licence as addressed in Regulation 15(3) of the Radio Frequency Spectrum Regulations, was introduced specifically to cater for the "smaller" type applications (e.g. Ski boats, Amateur, Citizen Bands, etc.) in order to reduce the administrative burden to the Authority in renewing these licences annually. It would seem that these "smaller" users are now benefitting whereas the operations of "bigger" and potentially national networks are jeopardised.

4.4.4 Sub-section 3.3.3 ("Economic life of the equipment installed")

The technological and economic lifetime of equipment, as addressed in section 3.1.4, refer to considerably different time frames. In general, the technological lifetime of equipment is significantly shorter than the economic lifetime of same. Moreover, a shorter technological lifetime does not imply a shorter economic lifetime, as suggested in sub-section 3.3.3 of the FMP.

Technology life-cycle varies between equipment and these should be considered on a case-by-case basis. For example, where the technology life-cycle of a cell phone could be less than one or two years, the same does not necessarily apply to other network elements, including radio transmission equipment, base stations, etc. Furthermore, re-tuning of equipment at a relative low-cost is only applicable for certain radio applications; generally this does not apply to radio transmission equipment.

Whereas Telkom fully supports this factor as one of the key elements to be considered in determining the time frame for migration, the content presented in this section does not address the issue; in fact it would seem that the Authority attempts to portray this factor as trivial. As a result, Telkom proposes a revision to this sub-section or suppression of same.

4.4.5 Sub-section 3.3.4 ("Adequate Forward Planning")

Telkom supports the need for adequate forward planning when it comes to frequency migration, including proper time for consultation. With regard to this matter, Telkom would argue that each frequency band must be considered on a case-by-case basis, which, in accordance with the draft FMR, will entail a consultation process. Whereas the identification of a frequency band and

subsequent inclusion in the FMP is one matter, it is a completely different matter to plan and execute the actual migration. The migration from analogue to digital television is an excellent example of the magnitude and complexities that could be associated with the frequency migration process. It is inconceivable to try and treat all frequency band migrations the same considering the uniqueness of the networks and services associated with each.

Telkom fully agrees with the statement that "…*there is little to be achieved by shutting down existing transmission before new licensees are ready to start transmitting…*". To this extent, frequency migration should not be implemented unless there is a clear identification of the need for the specific frequency band for another service or application, which will enhance the technical, economic and social benefits to the country.

4.4.6 Sub-section 3.3.5 ("Conclusion regarding time frame")

Whereas the forward looking time of 3 – 5 years (but considered on case-by-case basis), unless otherwise specified, for a process of spectrum migration could be supported in principle, it is important to clearly understand what is meant by "*from the moment of announcement*". For example, in Table 3 the Authority lists those frequency bands where there is a potential frequency migration issue. It is noted however that there is no time frame associated with these proposed migrations. It is therefore also not clear if the publication of the final FMP is to be taken as "*the moment of announcement*" will this occur through the publication of a RFSAP. This needs to be clarified. Again, an overall process description will be very helpful, in particular explaining the process of migration once the FMP has been published. Also, the bridge between the FMP (proposals) and the RFSAP (case-by-case) need further clarification.

4.5 Comments on Section 4 ("Development of the Radio Frequency Migration Plan")

4.5.1 Sub-section 4.1 ("Background")

In the context of "time frame", as discussed in Section 3 ("*Principles Governing Frequency Migration"*), the concept of "*Long term Migration Issues*" is introduced in this section and in Figure 1. It is however not clear what is considered "Long term migration issues" and how this relates to the time frame of 3-5 years as introduced in Section 3. This needs further clarification.

4.5.2 Sub-section 4.3 ("Approach to development of FMP")

The FMP was drafted using the NRFP 2010 as a basis. However, considering that WRC-12 made changes to the NRFP 2010, and since these changes generally (apart from specific Resolutions) comes into force on 1 January 2013 (see Article 59 of the ITU RR), Telkom would contend that the FMP must be drafted using the updated version of the NRFP as a basis. This will ensure that changes to the NRFP made pursuant to WRC-12 are also included in the FMP. It is however noted that an updated version of the NRFP 2010 has not yet been published.

Telkom would therefore recommend that the conclusion of FMP be delayed until the NRFP 2010 has been updated through the normal public process; failure to do so may lead to an out-dated FMP when the updated version of the NRFP 2010 is published.

Nevertheless, it is noted that in the third step in the approach to the development of the FMP, WRC-12 decisions were also taken into consideration. Telkom would however argue that it may be premature to consider frequency migration matters stemming from WRC-12 decisions prior to these decisions being officially adopted and implemented through an update of the NRFP. Telkom nevertheless agrees with the consideration of the various international, regional and national matters as listed.

4.5.3 Sub-section 4.4.3 ("Analysis of SABRE")

Telkom wishes to make the following comments on certain frequency bands. Telkom's comments are limited to certain frequency bands.

925 – 925.4 MHz: It is not clear as to why "*No allocation*" is indicated in the column "*Current allocation in NRFP 2010*" considering that this band is the 900 MHz IMT band, which is used for GSM/3G services in South Africa. This band is therefore allocated to the mobile services in South Africa. It should also be noted that the allocation to two-way paging was removed in SATFA 2004 (see Appendix D, page 120/124, 5th bullet).

1885 – 1980 MHz: Again, it is not clear as to why "*No allocation*" is indicated in the column "*Current allocation in NRFP 2010*" considering that this frequency range is allocated to the fixed and mobile services and is used extensively for a range of applications such as, amongst others, DECT cordless telephones, FWA and 3G/IMT systems in South Africa.

1980 – 2010 MHz // 2170 – 2200 MHz: Telkom notes the allocation to fixed links in these bands. Considering that these bands have been identified for IMT-satellite and in some countries for CGC (Complementary Ground Component) under the mobile services, the allocation to fixed links must be verified.

21 400 – 22 000 MHz: It must be noted that the WARC-92 decision to "downgrade" fixed links to secondary status in this band has been reversed by WRC-12. Fixed links and BSS therefore operate on a co-primary basis in this band.

As a general comment, it is not clear to Telkom what the ultimate purpose of this table is. Whereas it provides a list of frequency bands where migrations from SABRE 1 and 2 seemingly did not take place, it is not clear what action will be taken with regard to these identified frequency bands. For example, an assessment of each of these, in accordance with Authority's own proposed "*Process for Development of Frequency Migration Plan*" (see Figure 2 page 26/124; "*Were SABRE 1/2 proposals implemented*") would seem as the appropriate action to be taken. Nevertheless, it is not clear from this section what assessment, if any, has been taken since these frequency bands also do not appear in the new proposed migration plan. As a minimum, Telkom would recommend that another column be added to this table to indicate the

proposed action (i.e. “add to migration plan” or “do not consider for migration”, as indicated in the process). This will facilitate reading of the document without the need to cross-reference different tables to determine which bands are included or excluded from the migration plan.

4.5.4 Sub-section 4.7 (“ITU World Radio Conference Resolutions”)

There is uncertainty as to the criteria applied during the assessment of WRC-07 and WRC-12 decisions in terms of identifying possible candidate bands for inclusion in the FMP. Firstly, whereas Table 2 lists a number of WRC-07 and WRC-12 Resolutions, there is no indication as to how these could impact frequency migration (some of these are included in the proposed migration plan and others not). Again, Telkom recommends that another column be added to indicate the outcome of the assessment (i.e. “add to migration plan” or “do not consider for migration”, as indicated in the process) in line with the Authority’s process for development of Frequency Migration Plan. This lack of clarity is compounded by the fact that the list presented in Table 2 (“*WRC Resolutions*”) excludes certain WRC-12 Resolutions that may have frequency migration issues. Moreover, no justification is provided for the exclusion of these Resolutions from the assessment.

In addition, the overall assessment of decisions taken at WRC-12, which is contained in Appendix F, further compounds the uncertainty. For example, in some cases in Appendix F (e.g. “*Early warning, disaster mitigation and relief operations*”) it is indicated that there is “*No direct impact for frequency migration*” whereas in others (e.g. “*more bandwidth for meteorological-satellite services*”), this statement was not indicated, assuming therefore that there is an impact on frequency migration due to the allocations to meteorological-satellite services. However, the frequency band/s and impact on frequency migration has not been indicated. Also, WRC-12 made several new allocations to services such as meteorological aids, amateur, radiolocation (several bands), mobile-satellite, etc, which are not mentioned/addressed in Appendix F. Their exclusion raises serious doubts as to the accuracy of the results presented in this appendix. The overall purpose and relevance of Appendix F is therefore not clear.

Furthermore, it is not clear why these matters are addressed separately in an Appendix whereas the Resolutions are contained in the body of the document; it would seem that WRC Resolutions are given a higher priority or status compared to other decisions of the conference (e.g. amendments to the table of frequency allocations), which is definitely not the case.

4.5.5 Sub-section 4.9 (“Proposed Migration Plan”)

Telkom will address Table 2 in conjunction with the band specific comments provided in sub-section 4.11 (“*Commentary on bands with respect to migration*”).

4.5.5.1 Execution of “Proposed migration plan”

As mentioned in previous sections, it is not clear to Telkom as to how this proposed migration plan will be executed. For example, the following questions/issues come to mind in this regard:

- Will each of the listed frequency bands be addressed as a separate project managed by the Authority? How will the Authority manage the migration process seeing that a lack of control over migration lead to the general failure of previous migrations.
- When will the Radio Frequency Assignment Plan be developed?
- Will the RFSAP be developed per band (per project) or as a batch addressing various migrations?
- When will the Authority assess (in detail and maybe using the DoC audited spectrum data) the current use of the frequency band in question?
- What time frame will be used for the migration of users from the particular frequency band (taking into consideration the factors as listed in section 3.3, e.g. determining the economic life of the installed equipment)?
- New frequency bands must be identified for the affected users.
- Radio frequency spectrum licences must be amended accordingly.
- When is the "moment of announcement" (see section 3.3.5)?

Details on the aforementioned questions/issues are necessary for the development of a frequency migration plan. Failure to address these crucial matters, or as a minimum explaining where and how these will be addressed, will merely result in the FMP stagnating in draft phase for a considerable period. In any event, it is clearly indicated that the table includes those frequency bands where frequency migration is "under consideration". Table 3 is also labelled as "proposed". Based on this, it is not clear when the final decision will be taken as to the finalisation of candidate bands for frequency migration. Telkom respectfully submits that these issues must be addressed in the FMP in order to ensure an orderly and successful migration plan.

4.5.5.2 Formatting of Table 3 ("Proposed Migration Plan")

Column 3 of Table 3 is labelled "*Proposed Allocations / Utilization*"). However, this column does not contain any "allocations" but rather utilisation / applications. It is recommended that the allocation be added (either new or same). Also, in line with standard practice, allocations should be entered in upper or lower case as appropriate and utilisation shown within brackets (as also used in Column 2).

4.5.5.3 Band specific comments

This section addresses the proposed frequency migrations on a band-by-band basis. It should be noted that the following is not necessarily a detailed analysis of all frequency bands; nevertheless, comments will be made where possible.

150.05 – 153 MHz: It is not clear why the "Proposed allocation" column was left blank.

235 – 267 MHz: Whereas the band 246.18 – 254.18 MHz is allocated to TV broadcasting, it is noted that, in terms of ITU RR footnote 5.252, the allocation to broadcasting is limited to the band 246 – 254 MHz.

335.4 – 387 MHz: The proposed migration of "*existing fixed links to above 3 GHz*" is not clear. Firstly, the use of the band is in line with the proposed allocation (band 336-346 MHz paired with 356 – 366 MHz for FWA/PTP/PTMP, which includes PTP links). Furthermore, the SADC FAP is in line with the South African allocation for this particular band so it is not clear why fixed links must be migrated "*as per SADC proposed common sub-allocation/utilization*); since there is also no mention of any migration of fixed links from this band. From a practical point of view, it is also not possible to migrate PTP links operating in this frequency band, which provide narrow band voice channels to radio systems in frequency bands above 3 GHz (equipment not available and propagation conditions differ). Furthermore, the Authority is also proposing additional bands below 3 GHz for, amongst others, PTP links which goes against the proposal to migrate these links to bands above 3 GHz.

405 – 430 MHz: In line with the table of frequency allocations, the band 405 – 406.1 MHz should be excluded from this frequency range.

440 – 450 MHz: Whereas the existing allocation is indicated only as short range business radio and PMR, this band also has allocations for, amongst others, Telemetry / Data (440-441 MHz // 445-446 MHz) as indicated in the NRFP 2010. Within this allocation, an assignment of 2 x 100 kHz was made to Swiftnet Pty Ltd. It would seem that these other allocations remains as is ("*Other allocations stay as-is*"). According to section 4.11.12, the bands 440-440.1 MHz and 446-446.1 MHz are allocated for short-range business radio and temporary assignments within the PMR band, respectively. Again, the other allocations are not addressed and it seems that these remain as-is. Nevertheless, the last two bullets in this section could create confusion since they seem to be contradictory, i.e. "*all other users migrate out of this band*" and "*the rest of the users in this band can stay as-is*". It is presumed that the 3rd bullet refers to the bands listed in bullets 1 an 2 whereas the 4th bullet refers to the remainder of the band 440 – 450 MHz. This needs to be clarified. According to Table 4 it seems that the other users must migrate out of this band.

450 – 470 MHz: The frequency band 450 – 470 MHz is used by many different users and for various uses (not only trunked mobile as indicated in the first sentence but as indicated in figure 5 of the FMP). In addition, 2 x 200 kHz is assigned to Swiftnet PTY Ltd, which is not reflected in section 4.11.13. The statement that the SADC FAP proposed common allocation /utilization seeks to allocate this spectrum exclusively for mobile IMT is factually incorrect. As a matter of fact, the SADC FAP proposed common allocation is for three services namely fixed links (PTP), IMT and PMR/PAMR. In the "Additional information" column it is also indicated that the band is currently used for a variety of fixed and mobile systems in the various SADC countries. Telkom will also question the accuracy of the spectrum usage analysis done by the Authority in this band seeing that most of Telkom's assignments are not reflected in this report.

Whereas Telkom agrees that this band has been identified for IMT services, it is not yet clear when this band will be used for IMT applications on a large scale. Also, an appropriate channelling plan has not yet been adopted for South Africa, noting that there are many options for using this band for IMT. The various options are contained in ITU-R Recommendation M.1036 as indicated in the figure below. The option selected will also have a direct impact on

the migration of existing services, for example, if option D5 is selected the PTP links could remain. On the other hand, if option D1 is taken, the Transnet and mobile trunking assignments could potentially remain. Ultimately, the choice of IMT frequency channel plan must be considered carefully taking into account the availability of IMT equipment in the international market. Also, the economic viability of using this band (which has very limited spectrum unless the TDD option is taken) must also be considered in the assessment of the economic, technical and social value in using this spectrum by the incumbents or the IMT. A blanket statement that all existing users must migrate from the band is very premature. The potential availability of the 700 MHz and 800 MHz bands for IMT must also be taken into account when deciding on the short to medium term use of the 450 MHz band.

In line with Telkom's comments made in section 4.5.5.1 above, it is clear to Telkom that this band requires further consultation before a final decision is taken regarding the migration of the incumbents. Also, considering the number of users (including thousands of PMR users) and uses, migration in the short to medium term will probably not be possible.

Telkom has more than 690 networks in the form of low capacity PTP links in this band using 10 x 12.5 kHz duplex channels. The migration of these links will not only have substantial cost implications for Telkom but also technology challenges in identifying an alternative frequency band to satisfy the unique requirement for long hop length low capacity links.

At the time when Telkom performed testing of a FWA systems in the 450 MHz band, we received confirmation from the Authority that there are "thousands" of PMR operators operating nationally in this band. Migrating these individual users will be challenging and probably result in the need to implement migration over the medium to long term only.

Lastly, the statement that the current users, which include paging, PMR, trunking, etc. must migrate into the bands above 3 GHz is completely illogical and technically not possible since these types of mobile applications are generally not deployed in the bands above 3 GHz.

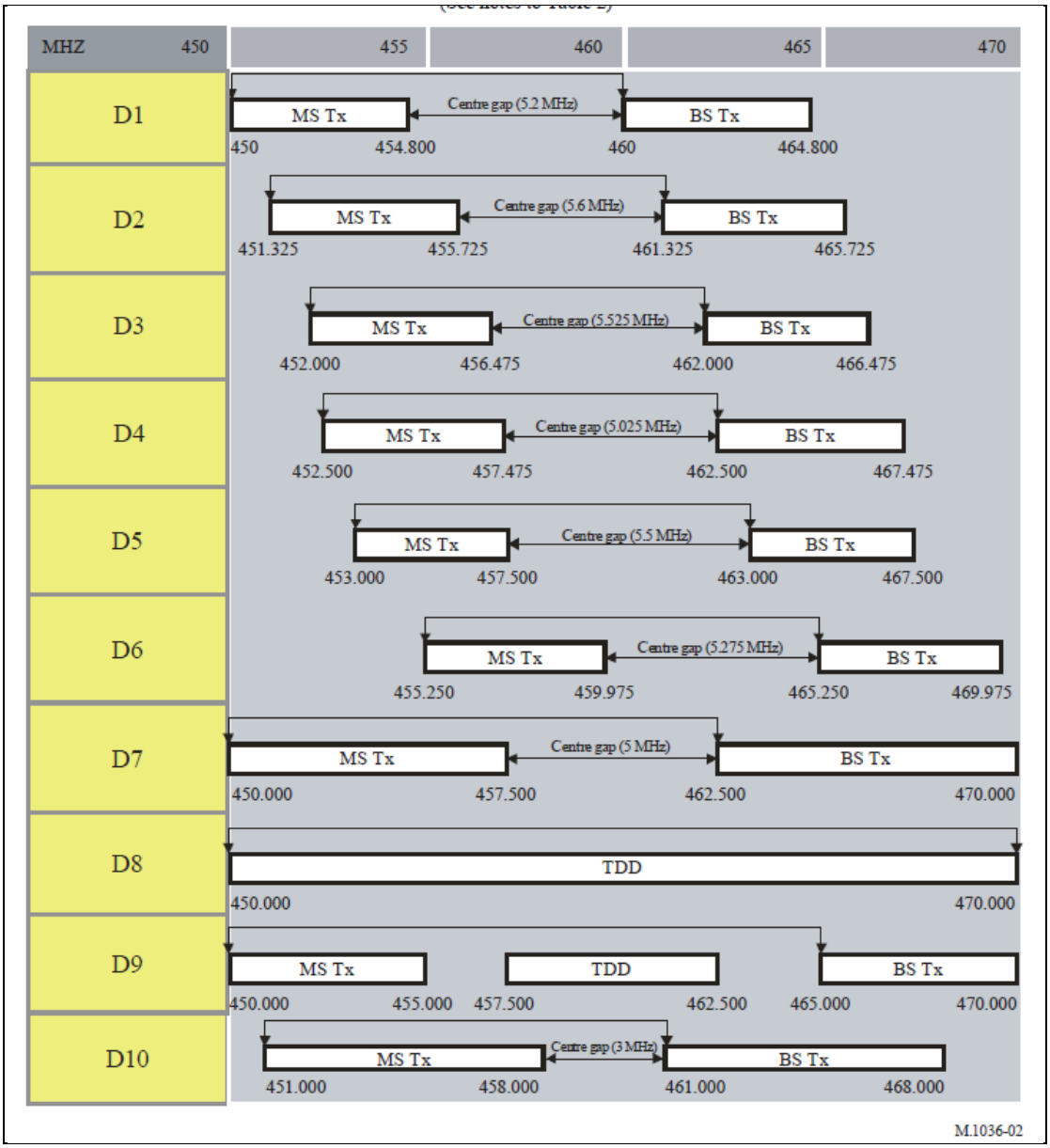

Figure 2: Possible frequency arrangements in the band 450 - 470 MHz

694 – 790 MHz and 790 – 862 MHz: Telkom supports the proposals to limit broadcasting systems to the 470 – 694 MHz band and to make the band 694 – 862 MHz available for mobile (IMT). Telkom also supports the migration of the listed services simultaneously from both bands in order to ensure that both 700 MHz and 800 MHz bands are available as soon as possible.

Whereas the Authority proposes that migration from both 700 MHz and 800 MHz frequency bands would be concurrently defined and implemented, it is also indicated that the time-line to complete the implement from 700 MHz could be staggered as compared to the 800 MHz band. The intention should therefore be clarified. Considering the on-going efforts from the Authority with regard to the re-planning of the broadcasting systems within the SADC region in the

frequency band 470 – 694 MHz, Telkom would recommend that migration from both frequency bands should be addressed concurrently to ensure that both bands become available for IMT at the same time and as soon as possible. Licensing for these bands should run in parallel with the migration process and could commence as soon as ITU-R WP5D has agreement on the appropriate channel plan for the 700 MHz/800 MHz frequency bands for Region 1. This will ensure that the bands could be used the moment the broadcasting systems are switched-off or even earlier in areas where these bands are not used for broadcasting.

862 – 890 MHz: Telkom is concerned that the information presented here is factually incorrect and incomplete. For example, the frequency bands 880 – 890 MHz paired with 925 – 935 MHz (also known as the E-GSM band) has been assigned to Cell-C (not Neotel as indicated). This is reflected in a presentation from the Authority given at the recent DTT meeting in Ghana held 27 – 28 September 2012 (see figure below).

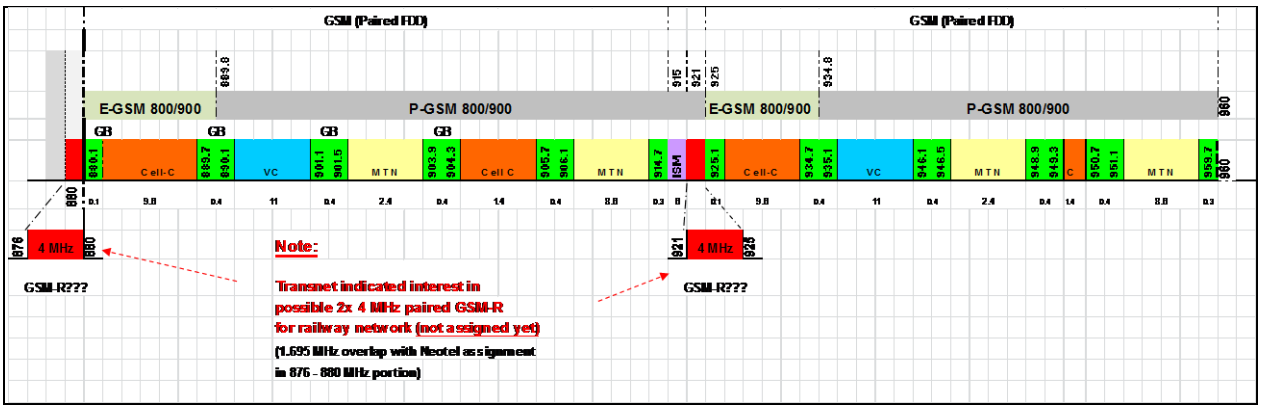

Figure 3: Frequency arrangements in the band 880 - 960 MHz

Furthermore, the allocation to Wireless Access Services in the frequency bands 824 – 849 MHz paired with 869 – 894 MHz, is the international CDMA-2000 or GSM850 frequency band. It is Telkom understands that a portion of this band is assigned to Neotel for their CDMA-2000 deployments (the full band is not available due to the overlap with the GSM 900 MHz band). It is not clear therefore why the Authority proposes the delete this configuration (although part of the IMT allocation) noting also that, in Government Gazette No. 34872 it is proposed that Neotel will continue operating in this band in the foreseeable future. However, Telkom recommends that the CDMA-2000 systems be migrated from the 850 MHz band to ensure full use of the 800 MHz in South Africa.

The frequency band 864.1 – 868.1 MHz is assigned to Telkom and is being used for CT2 FWA systems. Telkom is planning the migration of these networks within the next 5 years depending on the availability of suitable alternative wireless systems. In this regard Telkom urgently need access to the 900 MHz band to allow 8ta to extend their network into rural areas.

The frequency band 876 – 880 MHz (which is paired with 921 – 925 MHz) is not listed in section 4.11.16. In line with the proposals made in section 4.11.17, this band could be allocated to GSM-R. The return path of GSM-R (921 – 925 MHz) is addressed in section 4.11.17.

The statement that the entire band (presumed to refer to the band 862 – 890 MHz) should be re-planned for IMT (as per SADC proposed common sub-allocation/utilisation) seems also strange. Although the entire band 790 – 960 MHz has been designated as an IMT band (see ITU RR 5.317A), only certain portions of this spectrum range can in reality be used for IMT notably the 800 MHz, 850 MHz and 900 MHz frequency bands as addressed above (see IMT bands identified in ITU-R Recommendation M.1036). It may however be possible that the frequency band 862 – 876 MHz (range between 800 MHz and 900 MHz bands) be considered in future for IMT as part of WRC-12 Agenda Item 1.1 (New IMT frequency bands) although this is premature and could only be considered once WP5D have made decisions in this regard. Therefore, depending on the outcome of these developments, it is premature to discuss the migration of existing users (presumable RFID, alarms, etc.) from the band. This is also supported in the SADC FAP through the following statement: "*The use of this band [862 – 876 MHz] for IMT in the future to be investigated as part of the development of harmonised IMT channelling arrangements*".

890 – 942 MHz: Again, Telkom is very concerned that the Authority is making serious factual incorrect statements in this section. Based on the diagram above, which was presented in Ghana by the Authority, the band 890 – 915 MHz paired with 925 – 935 MHz (GSM 900 MHz band) has been assigned to Vodacom and MTN and not Cell-C as indicated in section 4.11.17.

Although Table 3 indicates that the band 915.1 – 921 MHz is allocated for RFIDs, section 4.11.17 limits this allocation to the frequency band 915.1 – 919.2 MHz only. Telkom would argue that the band 915.1 – 921 MHz may be used for a range of short range applications, including RFIDs. This statement is based on the regulation on Spectrum Re-allocation for Radio Frequency Identification (RFID) Systems as published in Government Gazette No. 31127 (dated 5 June 2008).

Whereas Telkom could support the allocation to GSM-R in the band 921 – 925 MHz, as indicated above, it is not clear why the return path for GSM-R (i.e. 876 – 880 MHz) has not been included as well since this is an FDD system. The same omission occurs in Table 4.

942 – 960 MHz: Telkom argues that the GSM 900 MHz band be re-farmed in order for 8ta to obtain a portion of the band for GSM voice, similar to the process when Cell-C were launched and 900 MHz spectrum was redistributed to ensure that Cell-C could operate in this critical frequency band. See also comments made in section 4.5.8.

1350 – 1375 MHz (1492 – 1517 MHz) / 1375 - 1400 MHz (1427 – 1452 MHz): The way these two bands are presented in section 4.11.19 may create confusion and Telkom therefore recommends that it be changed as also indicated in Table 2 namely: **1350 – 1375 MHz // 1492 – 1517 MHz and 1375 – 1400 MHz // 1427 – 1452 MHz.**

The band is currently allocated to Fixed Services on a primary basis. Telkom has many low capacity PTP links in the upper part of the paired bands 1375 – 1400 MHz and 1427 – 1452 MHz. The proposal to allocate the band to BFWA services is based on the favourable propagation characteristics inherent to this band. However, global trends indicate that due to

economies of scale BFWA will in future be deployed using mobile spectrum and mobile technologies. Moreover, the absence of harmonised spectrum profiles or equipment makes this band unsuitable for rural BFWA services. As a result, Telkom does not support allocating this band for BFWA at this stage. Nevertheless, it is possible that these frequency bands (including adjacent frequency bands) could be identified for IMT under WRC-15 Agenda Item 1.1 (the bands are already allocated to the mobile services). It is therefore recommended that a decision in this regard be postponed until after WRC-15. Given that an allocation is made at this stage, it should be for BWA, which includes mobile and fixed services.

It is indicated that existing links could be maintained; Telkom supports this proposal.

1452 – 1492 MHz: As discussed above, this frequency band has been mentioned in WP5D as a possible candidate band for IMT under WRC-15 Agenda Item 1.1. If WRC-15 decides to identify this band (and adjacent bands) for IMT, a re-planning of the band could be performed. In such cases, a common profile (channelling plan) will be developed, which will drive the availability of equipment. Telkom therefore recommends that a decision pertaining to this band be postponed until after WRC-15.

1518 – 1525 MHz: Considering that the entire L-band is under discussion as possible additional IMT bands at WRC-15, Telkom recommends that a change in the allocation to this band be postponed until after WRC-15. Even prior to WRC-15, during the development of the CPM Report, it will become clearer which frequency bands are being proposed as candidates bands and a decision pertaining to the future use of this band should be delayed at least until there is more insight as to possible IMT candidate bands. Also, this allocation should be 1517 – 1525 MHz.

1525 – 1559 MHz: Without going into a detailed assessment, this proposal seems reasonable. With regard to the last bullet, it is assumed that the band 1530 – 1559 MHz will be retained as-is considering that only the band 1525 – 1530 MHz (5 MHz) is proposed for fixed links, which is in line with Table 2. Furthermore, although not clearly specified, it is assumed that these fixed links will be simplex links (OB links are generally simplex although repeater links could be duplex); this must be clarified. If duplex links the return band (or FDD arrangement) must be specified.

1668 – 1675 MHz and 2483.5 – 2500 MHz: Whereas the band 2483.5 – 2500 MHz is included in the title of this section, it is not addressed as such; this must be clarified.

1880 – 1900 MHz: As also indicated in the NRFP 2010, this band is used for both DECT cordless telephones and DECT (FWA). In allocating this band for BFWA, Telkom would advise the Authority to carefully consider the sharing between DECT cordless telephones and BFWA, especially where both are used within the same environment, for example in a house or office. Telkom's previous experience in this regard has shown that sharing is not feasible due to the high levels of interference encountered. This is also one of the reasons why Europe does not use this band for IMT (even though the IMT allocation starts at 1885 MHz) due to the extensive use of the band for DECT cordless telephones. Furthermore, Telkom will question the allocation to BFWA (i.e. fixed); an allocation for BWA (i.e. to include both fixed and mobile) should be

considered, while taking into account the sharing issues. Current DECT FWA systems are earmarked for migration.

1980 – 2010 MHz // 2170 – 2200 MHz: Although there seems to be limited development of IMT satellite services in these bands at this stage, it is noted that CGC (Complementary Ground Component) or ATC (Ancillary Terrestrial Component) as used by the FCC (see ECC/DEC/(06)09), to overcome certain problems associated with mobile-satellite systems (e.g. coverage and in-building penetration) issues are deployed here. This will promote the use of these bands for satellite type services. Telkom therefore advises that the MSS (IMT) allocations should be retained, despite the fact that the band is used also for PTP links. On the other hand, it is not clear as to why additional PTP bands are required considering the availability of bands such as 2 GHz (F.1098) and 1.4 GHz. It is noted that the band F.1098 is underutilised, as indicated in section 4.11.26. With regard to the proposal to allocate the band for BFWA, it is recommended that the availability of suitable BFWA equipment in these bands first be assessed prior to making the allocation.

2025 – 2110 MHz paired with 2200 – 2285 MHz: Telkom supports the continued use of this band for PTP links. The allocation of the band for BFWA must be considered carefully since frequency sharing between BFWA systems and PTP links in the same area may be difficult.

2290 – 2300 MHz: Although Telkom does not oppose this proposal, it is not clear how and if this 10 MHz of spectrum will be used for BFWA. This could also be extended to include the portion 2285 – 2290 MHz, which is currently unused. An allocation to BWA (to include fixed and mobile) should rather be considered.

2300 – 2450 MHz: Telkom supports the allocation of the band 2300 – 2400 MHz for IMT, in line with SADC and ITU as well as the migration of fixed links and OB links out of this band. Notwithstanding this support, Telkom has a very extensive PTMP TDMA network operating in the frequency band 2307 – 2387 MHz paired with 2401 – 2481 MHz on a national basis. Since most of these systems operate in the rural areas, suitable alternative technologies must be found to replace the voice and data services of the current customers. In light of this, a possible re-farming of the 900 MHz band should be explored, where 8ta is assigned spectrum in the 900 MHz band for the provision of voice services, particularly in rural areas. It should be noted that migration from the 2.4 GHz band will be costly and may take several years to complete.

2500 – 2690 MHz: According to section 4.11.29, Sentech is assigned 65 MHz in this band; this should be 50 MHz, as also indicated in Table 2. Whereas Telkom supports the re-planning of this band as proposed in Government Gazette No. 34872, Telkom does not support the proposed licensing of the bands as proposed in this Gazette; this is a separate process and should be addressed as such. Telkom supports the allocation of this band for IMT.

3400 – 3600 MHz: Telkom supports the allocation of this band to mobile (IMT). A suitable channel plan should however be developed for this band. In terms of ITU-R Recommendation M.1036, two options are provided namely an FDD and TDD option. In the interim, Telkom recommends the adoption of F2 (FDD option), as indicated below.

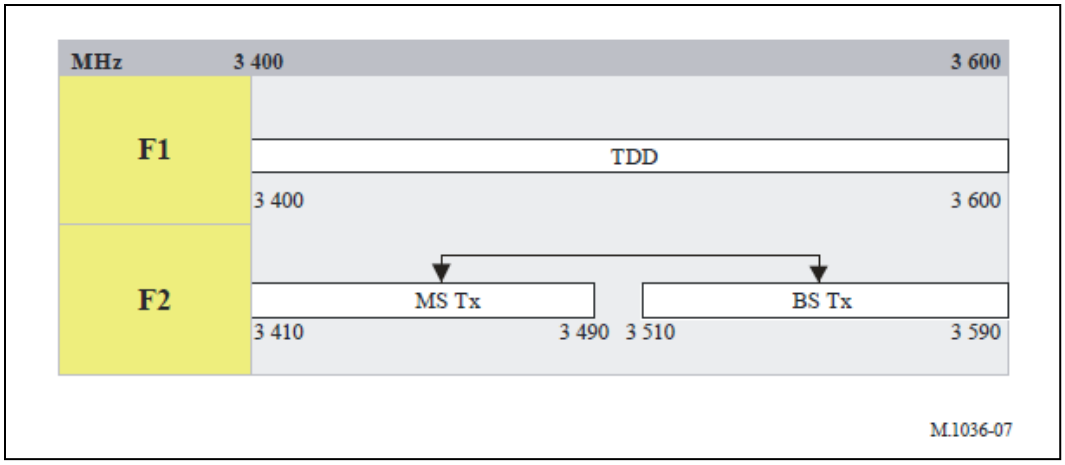

Figure 4: Frequency arrangements in the band 3400 – 3600 MHz

The development and adoption of this channel plan in Europe and elsewhere must however be monitored to ensure that this is the appropriate option for South Africa in order to achieve economies of scale in user equipment. Telkom is in the process of migrating existing users from this band. In line with the harmonisation of this band with the use in SADC, it is important to note that this band is not available for satellite services.

3600 – 4200 MHz: Telkom recommends that the migration of C-band VSAT services to Ku-band be postponed at this stage. Although this band is used for BFWA in certain SADC countries, the commencement of a migration process in the sub-band 3600 – 3800 MHz is deemed premature at this stage. Although it is highly likely that this band will be identified as a candidate band for IMT under WRC-15 Agenda Item 1.1 (supported by Europe), a decision in this regard will only be taken at WRC-15.

The majority of SADC countries do not fall within the standard Ku-band satellite footprint. As a result, C-band networks are used to provide connection from South Africa to these countries as well as within these countries, in particular in the rural areas. A migration of C-band systems from the band 3600 – 3800 MHz to Ku-band could have severe financial implications. On the other hand, it should be noted that, within South Africa, ubiquitous VSAT systems are deployed predominately in the Ku-band and now also in the Ka-band. Whereas C-band is still used for certain national applications, its use has declined substantially over the last 10 years and is continuing to decline. A detailed assessment of the current and future requirements of C-band is required, not only in preparation for WRC-15 but also to take an informed decision regarding the future use of this band in South Africa.

With regard to the SADC FAP, it is Telkom's view that the SADC FAP proposal to migrate the C-band services to the Ku-band is based on the scenario where a large number of BFWA systems are deployed in the same areas as ubiquitously deployed VSAT systems, for example in urban areas. The SADC FAP is therefore not recommending that all satellite systems be migrated from the band 3600 – 3800 MHz; it may be possible that sharing is feasible in certain cases. Notwithstanding this, Telkom would not support the migration of VSAT systems from the

band 3600 – 3800 MHz until after WRC-15, when the issue could be re-considered based on the outcome of the conference. Regardless of the outcome of WRC-15, if South Africa is to decide to use this sub-band for BFWA in line with certain SADC countries, a detailed analysis of the use of the C-band in South Africa and SADC countries is required before imposing any frequency migration.

5470 – 5725 MHz: Statements made pertaining to this band seem superfluous considering that the band is already allocated for WAS/RLAN in the NRFP 2010 as well as in the Radio Frequency Spectrum Regulations (Government Gazette No. 34172, dated 31 March 2011). There is also no migration issue pertaining to this band.

5725 – 5850 MHz: The statement that ITU footnote 5.453 allocates the band for fixed and mobile services on a primary basis is misleading and factually incorrect. This footnote applies only to the listed countries; South Africa is not included in this footnote. The use of this band for these services in Swaziland and Tanzania is correct since these two SADC countries are included in 5.453. Therefore, according to the ITU Table of Frequency Allocations, there is no allocation to fixed and/or mobile services in South Africa in this band. South Africa may however still use this band for these services provided that these systems do not cause harmful interference to systems operating in other countries and in accordance with the Radio regulations. Notwithstanding this debate, it is noted that the Authority already approved the use of this band for, presumably PTP and PTMP systems, on a licence exempt basis and using high powers (see Government Gazette No. 34172, dated 31 March 2011). There is no migration issue pertaining to this band and it should therefore be addressed as part of the updating of the NRFP 2010.

5850 – 5925 MHz: The use of this band for temporary outside-broadcast links must be clarified. Although the band can be used for both FSS and fixed systems, and therefore potentially could be used for OB terrestrial links or using satellite, it is not clear if these OB links are terrestrial or satellite. Generally speaking OB links are PTP links and should therefore be added to the fixed services allocation and not the FSS allocation. Nevertheless, it must be noted that temporary links must be coordinated on a case-by-case basis with both PTP links and FSS systems. In the case of rapidly deployed OB links, frequency coordination may become a challenge.

5925 – 6700 MHz: This band is already allocated to for fixed PTP links and satellite as also indicated in section 4.11.35. It is therefore not clear why this band is included in the FMP seeing also that no migration issue has been identified.

10700 – 11700 MHz: This band is the standard Ku-band and is available for, amongst others, VSAT systems.

12290 MHz, 16420 MHz: Whereas these two frequencies are listed in the table with incomplete information there is also no further discussion of these in section 4.11. It is recommended that this be amended accordingly.

15400 – 15700 MHz: Whereas this frequency band is listed in the table with incomplete information there is also no further discussion of this band in section 4.11. It is recommended that this be amended accordingly.

40 GHz and above: Although Telkom supports the addition of PTP bands in the bands above 40 GHz, including E-band and V-band, it is recommended that this matter be addressed as part of the updating of the NRFP 2010. Also, Telkom recommends that a process of "light-touch" licensing regime for these two bands be considered. An appropriate amendment of the Radio Frequency Spectrum Regulations 2011 may be required to accommodate this proposal.

4.5.6 Sub-section 4.10 ("*Current utilization / assignments of bands intended for migration*")

Telkom notes the statement that the DoC spectrum audit data will be incorporated by reference. It is however not clear how this data will be made available, how it will be used in the migration process, etc. It is proposed that further details should be provided as to the intention of this incorporation.

It is also not clear if the audit data has been used in developing the draft FMP, which is concerning since actual current use is very important in any decision pertaining to migration of users. Real audited data cannot replace allocation information contained in any band plan (i.e. SABRE and SATFA). Also, the DoC spectrum audit was limited to the frequency bands above 500 MHz, whereas many bands below 500 MHz has also been included in the draft FMP, indicating that the audit data played a limited if any role in developing the FMP. It may be possible that the audit data will be considered during the development of the RFSAP although this is not clear from neither the draft FMR not the FMP.

4.5.7 Sub-section 4.12 ("*Summary of new ICASA Proposals*")

It is with concern that Telkom note the contradiction between the note in Table 4 for the frequency bands 1350 – 1375 MHz paired with 1492 – 1517 MHz and 1375 – 1400 MHz paired with 1427 – 1452 MHz, with that contained in section 4.11.19. Whereas Table 4 indicates that existing fixed duplex links must be migrated out of this band, section 4.11.19 indicates that existing links are to be retained ("*too expensive to migrate*").

4.5.8 Sub-section 4.13 ("*Commentary on spectrum Re-farming*")

Telkom notes this section. It is however not sure what the intention is with these, mostly factual, comments and the matter needs to be further explained. The issue of re-farming spectrum, for example in the 900 MHz band as also addressed in this section, is a point in case. Whereas Telkom agree mostly with all the statements made, it is noted that Cell-C has already re-farmed their 900 MHz spectrum and is using this band for 3G services. Based on media articles, it seems that Vodacom and MTN is also planning to re-farm their 900 MHz and 1800 MHz assignments for 3G/LTE applications. Telkom is also considering re-farming its 1800 MHz

assignment and therefore supports these initiatives; these should be done by the spectrum users based on commercial and operational decisions. In an environment where spectrum licences are technology neutral, as an ECA policy, re-farming should be done by the users based on commercial and business decisions (ensuring also that no harmful interference is caused to other licensees).

Telkom fully supports the statements of the Authority as made on page 63/124 (last bullet in section 4.13.3). It is common knowledge that 8ta is the only national mobile operator without access to spectrum below 1 GHz. This imbalance in access to sub-1 GHz spectrum creates a tremendous disadvantage to 8ta compared with Vodacom, MTN and Cell-C and distorts competition. Telkom would therefore support the notion that the 900 MHz band be re-farmed with the objective of each of the three incumbent licensees releasing a small portion of their assignments and, through a band optimisation (or re-farming) process that will lead to the reduction in gaurdbands, 8ta should received a minimum of 2 x 5 MHz assignment in the 900 MHz band. Although other sub-1 GHz bands will become available in the future (i.e. 700 MHz and 800 MHz) this will be after 2015 only; 8ta therefore needs access to the 900 MHz immediately in order to re-balance access to sub-1 GHz in order to facilitate fair competition.

Telkom supports re-farming of the 900 MHz band into contiguous assignments as the release of any spectrum unused due to unnecessary gaurdbands will be in the best interest of all stakeholders. The cost associated with this migration is off-set by the value of this spectrum; it is therefore crucial to eliminate unnecessary gaurdbands to the extent possible. Also, because all handsets operate throughout the entire GSM and E-GSM band, migration of the network will not impact users.

Telkom therefore urges the Authority to start a process of re-farming the 900 MHz band. 8ta not having access to the 900 MHz frequency band is a serious disadvantage. The late entrance into the market, along with being a fourth competitor, makes it extremely challenging for 8ta to bring aggressive cost competition into the market along with a quality mobile experience. The implementation of GSM in the 1800 MHz band compared to a 900 MHz implementation effectively translates into more than 50% CAPEX increase. Such a dramatic increase in CAPEX also translates to similar increases in OPEX spend making it very difficult to actively compete on basic voice services or other advance services (such as 3G) that may be implemented by the incumbents in this lower band. We therefore strongly support the proposed re-farming, which could release a minimum of 5 MHz paired to Telkom Mobile, which is the minimum required to implement a network. The re-farming of the 900 MHz band based on the introduction of Cell-C into the market set a precedence to level the competitive arena for all operators to have a fair opportunity to not only present aggressive competition in the market in the interest of the consumer but also achieve and maintain reasonable profitability. We appeal to the regulator to continue with the proposed re-farming and consider Telkom's request to accommodate an assignment of 2 x 5 MHz in the 900 MHz band.

4.6 Comments on Section 5 ("*Potential Impact of Spectrum Migration*")

4.6.1 Sub-section 5.1 ("*Bands planned for IMT*")

The information provided in this section is inaccurate and also misleading. Firstly, although the listed bands are in theory available for IMT (allocated as such by the ITU), in reality certain bands cannot be used due to IMT equipment not being readily available (e.g. 1880 – 1920 MHz), at least not in the short term. In other frequency bands (e.g. 862 – 876 MHz) IMT profiles are yet to be developed, which means that these bands will not be usable for IMT in the short to medium term. Furthermore, the total allocated bandwidth is generally larger than the actual usable IMT spectrum, considering the need for guard bands and centre gaps in the case of FDD profiles (e.g. 790 – 862 MHz is 72 MHz but the band plan is only 2 x 30 = 60 MHz). It is also not clear why those frequency bands already allocated and assigned to GSM / UMTS are not included in these figures since it misrepresents reality (read also in the context of re-farming). Lastly, some data is wrong, e.g. double counting of the band 790 – 792 MHz.

4.6.2 Sub-section 5.2 ("*Other migration issues*")

It is noted that the frequency bands 450 – 470 MHz and 790 – 862 MHz are listed in both sections 5.1 and 5.2; the reason for this is not clear.

5 EDITORIALS

The following editorials must be addressed:

5.1 Draft Frequency Migration Regulations

5.1.1 Section 1 ("Definitions")

- "**ITU**" means International Telecommunications Union. This amendment should be applied throughout the document.
- "**WRC**" means World Radiocommunication Conference

5.2 Draft Frequency Migration Plan

5.2.1 Section 3.1 ("Identification of Bands are subject to Frequency Migration"

The title of this section is incorrect and should read "*Identification of Bands which are subject to Frequency Migration*".

5.3 Appendix ("*Glossary*")

Whereas Telkom did not analyse the Glossary in detail, we note the following:

- The definition for "DECT" has been repeated although it does not contain the same information; these could be merged;

- The definition for “e.i.r.p” should be expanded (similar to the definition of e.r.p) to indicate that it is the product of the power supplied to the antenna and its gain relative to an isotropic radiator;
- IMT is defined twice;
- ITU means “International Telecommunication Union”; without the “s”
- PMR is defined twice;
- PPDR means “Public Protection and Disaster Relief”, as defined in ITU-R Report M.2033;

It is also noted that several definitions, which are contained in the Annex, is not used in the Consultation Document; it is recommended that these be deleted as it serves no purpose.