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Dear Mr. Makgotlho

**RE: DRAFT FREQUENCY MIGRATION REGULATION AND RADIO FREQUENCY
 MIGRATION PLAN**

We wish to thank the Authority for the opportunity to provide written comments on the proposed draft Frequency Migration Regulations and Radio Frequency Migration Plan as published in Government Gazette 35598 on 17 August 2012 which comments follow below.

Cell C wishes to make an oral submission when the public hearings are convened.

Yours sincerely

Mothibi Ramusi
Executive Head: Regulatory Affairs

DRAFT FREQUENCY MIGRATION REGULATION AND RADIO FREQUENCY MIGRATION PLAN

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1. INTRODUCTION

- 1.1 Cell C would like to thank the Authority for the opportunity to present these written comments, and requests the opportunity to both elaborate on the points below as well as to raise further points via oral submission when a public hearing is convened on the matter.
- 1.2 Cell C commends the Authority on the publication of the proposed draft Frequency Migration Regulations and Radio Frequency Migration Plan. Cell C is in agreement with the Authority that there is an immediate need to migrate services that no longer apply to the existing frequency bands in the National Radio Frequency Plan ("NRFP") as published in GG 33409. The immigration of these services must occur in the appropriate frequency band as identified in the NRFP.
- 1.3 Cell C encourages the Authority to use this process to address other matters such as in-band migration of existing services. This will ensure that the radio frequency spectrum assignments to different licensees is harmonized and therefore used more efficiently, realizing the fullest potential of the said radio frequency band.
- 1.4 In the last two years, the Authority has embarked on many regulatory milestones that are related to Radio Frequency Spectrum Management. Amongst these are the publishing of the 2010 NRFP (an update of the 2004 South African Table of Frequency Allocations, "SATFA"), the 2010 Radio Frequency Spectrum Fees Regulations, the 2011 Radio Regulations and the 2009 Terrestrial Broadcasting Frequency Plan. Furthermore, the Radio communications Sector ("ITU-R") held the World Radio Conference ("WRC") early 2012 that resulted in the most recent Radio Regulations. It is therefore important for the Authority to ensure that these proposed regulations are

consistent with the aforementioned regulations. Subsequently the impact the regulations will have on licensees once the migration is completed.

2. ISSUES OF CONCERN

2.1 *Complexity of the Migration Process*

Cell C believes that the Authority has embarked on a radio frequency migration process that seeks to address the requirements (resolutions) of the ITU Radio Regulations (Regional) on the NRFP, SADC Frequency Allocation Plan (“FAP”) and of national importance (outstanding requirements (recommendations) of SABRE 1 and SABRE 2 band plans, digital dividends 1 and 2 and lastly radio frequency spectrum in demand). Therefore it is observed that this radio frequency migration process encompasses several radio frequency milestones that unavoidably make this process complex. Cell C notes that the draft frequency migration regulation and Plan tends to take a discussion paper format rather than a technical regulation format.

Considering that the Authority has adopted a complex rulemaking process, Cell C recommends that prior to finalization of the draft regulations, a workshop be convened with interested parties. This consultation will assist licensees who are directly affected by the spectrum migration plan to understand the impact thereof. It is further unclear on the level of consultation that took place between the industry players in finalizing the SADC Frequency Allocation Plan. The affected licensees will need to plan well in advance in terms of financial, regulated timelines, subscriber awareness, new spectrum fees and equipment readiness.

2.2 *Development of the National Radio Frequency Plan, the Radio Frequency Spectrum Assignment Plan and the Radio Frequency Migration Plan*

The development of the NRFP, Radio Frequency Spectrum Assignment Plan (“SAP”) and Radio Frequency Migration Plan (“FMP”) are overseen by different rulemaking provisions. Therefore there must be no areas of ambiguity or wrongfully placed spectrum events between the three processes.

In the case of the NRFP, both the Authority and the Minister have different roles with specific requirements prior to the finalization of the NRFP as contemplated in Section 34 of the Electronic Communications Act, No. 36 of 2005 (“ECA”). When the Authority develops the NRFP in terms of Section 34(2), amends and update the NRFP in terms of Section 34(5), the NRFP must be approved by the Minister before publication. Therefore it is Cell C’s view that if there is any change to the **allocations** in the NRFP, the Minister must approve the amended/updated NRFP prior to publication.



When the Authority prepares the NRFP, it must do so in terms of section 34(7) (c) which states the following:

“34(7) In preparing the national radio frequency plan.....the Authority must

(c) consult with the Minister to-

- (i) Incorporate the radio frequency spectrum...
- (ii) Take account of governments current ...
- (iii) Co-ordinate a plan for the migration of existing users, as applicable, to make available radio frequency spectrum to satisfy the requirements of subsection (2) and the objects of this Act and of the other related legislation.”

From Subsection 34(7)(c)(iii) above, it is clear that any migration of existing users must be completed in accordance with a NRFP.

The development of a SAP is not contemplated in the ECA, however, the Authority has in Government Gazette 34172, Radio Frequency Spectrum Regulations, section 3, described what SAP's may consist of, the nature of the assignments, issuing (first come first served or competitive) and granting criteria (exclusive or shared) for spectrum assignments.

The development of Radio Frequency Migration Plan is not contemplated in the ECA, however, the migration of existing users is contemplated in subsection 34(7)(c)(iii) and subsection 34(16) of the said Act. Subsection 34(16) states:

“ The Authority may....and requires the migration of the users of such radio frequency spectrum to other radio frequency bands in accordance with the national frequency plan, except where such migration involves governmental entities or organizations, in which case the Authority-

- (a) Must refer the matter to the Minister; and
- (b) May migrate the users after consultation with the Minister.”

Cell C supports the migration of existing users to be aligned with the 2010 NRFP. Cell C does not however support the inclusion of any migration of users or governmental entities/organizations that require the Ministers approval. Cell C believes that subsection 34(16) must be completed prior to the migration of these users. To date Cell C is unaware if these provisions were satisfied as this information has not been made public. In the absence of such, Cell C believes that this process was not concluded.

2.3 In-band 900 MHz Migration

Cell C recommends adding in the draft regulations the harmonization of the 900 MHz radio frequency band through the in-band migration and

management of the E-GSM900 and P-GSM900 radio frequency band. The harmonization of this band will culminate into realizing the true potential of the radio frequency spectrum assigned to the relevant electronic communications network licensees. In terms of the Objects of the Electronic Communication Act, 2005, "the Act", Section 2(e), "the Authority must ensure efficient use of the radio frequency spectrum". Cell C believes that the in-band migration which is intended to harmonize the band will ensure efficient usage of the radio frequency spectrum. Currently only Vodacom is allocated a contiguous spectrum block whereas Cell C and MTN are allocated non-contiguous blocks of spectrum in the P-GSM 900 band.

This recommendation is further supported by subsection 4(e) of the draft regulations, "Process for Radio Frequency Migration" which states:

"4 The Authority shall initiate a process of radio frequency migration in the following circumstances:

(e) Where the Authority has determined that a change in a radio frequency spectrum license holder's assignment within a radio frequency band is required to enable more efficient use of the radio frequency spectrum (in-band migration)."

The table below illustrates the existing allocations and the migration to the new allocations. Please see Cell C 's **"E-GSM 900 and P-GSM 900 in-band migration and harmonization"** request submitted to the Authority on 23 May 2011, which includes the "Technical and Economic Report" as attached which further elaborates on the migration recommendation.

Existing allocations

Cell C	Vodacom	MTN
Ch 975 to Ch 1022 E-GSM 900 (48 channels)	Ch 1 to Ch 55 P-GSM (55 channels)	Ch 58 to Ch 69 P-GSM (12 channels)
Ch 71 to Ch 77 P-GSM (7 channels)		Ch 81 to Ch 123 P-GSM (43 channels)

Migration Allocations in both E-GSM and P-GSM frequency bands (925 MHz-959.8 MHz)

Cell C (57 Ch)	Vodacom (57 Ch)	MTN (57 Ch)
Ch 975 to Ch 1022 (48 channels) E-GSM plus Guard Band (3 Ch)	Equal number of Ch after first guard band between Cell C and	Equal number of Ch after second guard band between Vodacom and MTN

	Vodacom	
Ch 1 to Ch 6 P-GSM (6 channels)		

Cell C believes that the following advantages would be realised:

- a) Efficient use of the assigned spectrum in the applicable band, unused two guard bands may after migration may be used for commercial purposes offering relief from the existing arrangement;
- b) The introduction of new technologies for optimum use of existing spectrum in a particular band, easier to manage one contiguous block of spectrum instead a non-contiguous block;
- c) All three mobile operators are to make adjustments to their network to incorporate the free guard bands resulting in equal allocations. Vodacom's inconvenience must be kept to minimum, no re-planning required by them. The in-band re-planning by Cell C and MTN will culminate into three contiguous block allocations which will ensure that all three licensees are in a position to maximise the output of the spectrum assignments; and
- d) This type of exercise was successfully completed in Finland to the benefit of the end-user.

2.4 Government Gazette 34872

The Authority published Government Gazette 34872 on 15 December 2011 for written commentary. The draft regulations dealt with the draft assignment plan for the combined licensing of 800 MHz and 2600 MHz Bands. Subsequently, on 6 March 2012, the Authority published Government Gazette 35123, "Erratum Draft Invitation to Apply for Radio Frequency Spectrum License" wherein the Authority stated the following "The Authority hereby postpones this process until further notice."

Cell C is concerned that whilst this process is put on hold, the Authority has more than once referenced this gazette in the draft regulations. It is also unclear to Cell C if the Authority is seeking another round of comments to Government Gazette 34872. The Department of Communications ("DoC") has embarked on a similar process by publishing draft policy directions for comment on the same radio frequency spectrum bands. This process is not

yet finalized. Cell C finds it difficult to provide further comments than that which was submitted to the Authority on 29 February 2012 with regards to Government Gazette 34782 (these comments remain in force). This would result in pre-empting the final policy directions of these radio frequency spectrum bands and rendering this exercise fruitless.

Therefore Cell C recommends that any reference to the 800/2600 MHz radio frequency spectrum bands and Government Gazette 34782 should be removed from these draft regulations. Upon finalization of both the policy and regulation on 800/2600 MHz radio frequency spectrum bands, the Authority should develop a separate FMP and migration regulation.

2.5 Awareness Campaign and Impact of Spectrum Fees

Cell C recommends that these draft regulations include an awareness campaign to ensure all affected licensees are made mindful of the impending changes to their spectrum assignments. Cell C further recommends that the impact and applicability on migrating licensees of the Radio Frequency Spectrum Fees regulation as prescribed in Government Gazette 33495 be analyzed and known in advance of the migration event. This will provide for better planning and financial management by the affected licensees. It should also be made clear who is responsible for the migration costs and annual fees, either the licensee or the consumer of the service.

2.6 International Context

Cell C supports the following statement by the Authority:

“4.2 ...South Africa fundamentally follows the allocations in the Radio Frequency Plan for Region 1 in the ITU Radio Regulations and the primary driver for a change in use is a change in allocation stemming from a World Radio Conference Resolution.

As Region 1 also includes Europe, it is common for South Africa to harmonize the way it uses and manages frequency bands with Europe on the grounds that this facilitates coordination and allows South Africa to benefit from potential economies of scale with regard to equipment as well being able to capitalize on existing development work.”

In adopting new technologies and concepts, Cell C recommends that the Authority is consistent with ITU recommendations. The adoption of “wholesale open access and Spectrum Parks” is relatively new concepts. Therefore before the adoption of the above techniques by South Africa, it is imperative that these approaches are closely looked at in detail to ensure that their benefits far outweigh the above benefits.

Cell C further recommends that terms and definitions used in the draft FMP are consistent with those used in the ITU and NRFP environments.

3. SPECIFIC COMMENTS

DRAFT REGULATION Radio Frequency Migration Regulations (Part 1)

SCHEDULE

3.1 Regulation 2

"Purpose"

Cell C supports the purpose of these regulations, which states "The purpose of these regulations is to establish the framework by which the Authority may migrate users of the radio frequency spectrum under the National Radio Frequency Plan of South Africa." Cell C further recommends for consistency, certainty and good husbandry practice, all other required migrations that are not in the NRFP, SABRE1/2 and FAP be dealt with in a separate rule making process.

3.2 Regulation 3

"Principles"

Sub-regulation 3(5) states:

"The users to be migrated shall not be entitled to be compensated by the Authority for the costs of the migration."

Cell C recommends that licensees who migrate should not be compensated in any form or manner, be it financial, any radio frequency spectrum exchange and the awarding of additional high value radio frequency spectrum for migrating from a low value radio frequency band. Therefore Cell C suggests the following addition:

"The **licensees** to be migrated shall not be entitled to be compensated in **any form or manner** by the Authority for the costs of the migration."

3.3 Regulation 4

"Process for Radio Frequency Migration"



Cell C seeks clarity from the Authority on the approach to be taken when there is a radio frequency migration requirement in terms of the pronouncement of a radio frequency spectrum policy direction.

Cell C supports the circumstances when the Authority initiates the process for migration as stated in sub-regulation 4(e) which reads:

"Where the Authority has determined that a change in a radio frequency spectrum license holder's assignment within a radio frequency band is required to enable more efficient use of the radio frequency spectrum (in-band migration)."

Cell C believes that the above is in line with Cell C request to harmonize the 900 MHz band as described in section 2.3 of this submission.

3.4 Regulation 5

"Preparation of a Radio Frequency Spectrum Assignment Plan"

Cell C notes that the provisions in regulation 3, on the "Radio Frequency Spectrum Assignment Plans" as published in Government Gazette 34172 does not contemplate any matters of migration. Whereas these draft regulations contemplate the inclusion of migration matters as suggested in sub-regulation 5(2) which states:

"With respect to the radio frequency migration process, a Radio Frequency Assignment Plan may include

- (a) The process for migrating existing users and usages from their existing spectrum location, specifying the bands to which the users and uses will be migrated; including in-band migration where applicable.
- (b) The time scale for the reallocation of the radio frequency band in question, specifying the date at which the users to be migrated should cease transmission."

Therefore it is unclear to Cell C the difference between the SAP and FMP when it is related to matters of radio frequency spectrum migration. It would appear that the Authority will be duplicating the rulemaking process when developing the SAP and FMP for the same migration process. Cell C recommends that both processes should be distinct from each other. The SAP must contain the new "applications" requirement whilst all matters of radio frequency spectrum migration must be included in the FMP. This is also recommended in section 2.2 of this submission.

3.5 Regulation 6

"Amendment of a Radio Frequency Spectrum License"



Cell C recommends that where there are any changes to the annual radio frequency spectrum fees due to migration, this information must be included in the “notice” contemplated in sub-regulation 6(1) which states:

“Upon completion of the Radio Frequency Spectrum Assignment Plan, the Authority must issue a notice to users to be migrated.”

Therefore Cell C recommends the following addition to sub-regulation 6(2):

“6(2)(d) The new annual radio frequency spectrum fees”

This regulation deals with matters that are all related to the content of a notice. Therefore Cell C further recommends a change to the title of this regulation to read as follows:

“6. Notice of Amendment of a Radio Frequency Spectrum License”

Draft Radio Frequency Migration Plan (Part 2)

4.1 Sub-regulation 1.1

“Purpose”

The sub-regulation states:

“The plan provides for:

- Background and basis of the Radio Frequency Migration Plan.
- How the Radio Frequency Migration Plan was developed.
- Identification of the radio frequency bands where migration may be required and makes proposals regarding such frequency migration as may be required.
- The impact of the Frequency Migration Plan.
- International benchmark study on the experience of other countries with respect to matters relevant to spectrum migration.”

Cell C recommends that the following text to be included to ensure that the migration of licensees who are assigned radio frequency spectrum for various applications are within the ITU and NRFP frequency bands (with the accompanying allocations) and not to change the allocations. The change of the allocations will make the FMP process more complex. Also a change of allocation means an amendment or revision to NRFP which then requires a different regulatory process.

Cell C recommends the following addition:

“The Plan provides for:

- Only the migration of licensees whose assignments require realignment in terms of the NRFP, the relevant SABRE1/2 applications and SADC FAP applications as agreed with industry.

4.2 **Sub-regulation 1.2**

“Definitions”

Cell C supports the terms “allocation” and “assignment” as contained in the draft regulations and are consistent with the ITU definitions. Cell C recommends the introduction of the term “typical applications” in the FMP to ensure consistency with the NRFP and remove any ambiguity.

4.3 **Sub-regulation 1.2.3**

“Spectrum re-farming”

Cell C notes that the Radio Communication Assembly 2007 adopted Resolution ITU-R 56 that resolves that the term “IMT” be the root name that encompasses both IMT-2000 and IMT-Advanced collectively. Currently Cell C unlike the licensees’ in Europe has been issued with technological neutral radio frequency spectrum licenses. Cell C encourages and recommends the adoption of re-farming techniques as it promotes spectrum efficiency;

Cell C recommends the following addition to the definition:

“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, **or change in application**, this may include change in the specified technology and does not necessarily mean that the licensed user has to vacate the frequency.

4.4 **Sub-regulation 1.2.4**

“Other definitions”

The sub-regulation states:

“Where the user This has occurred with respect to the balancing of spectrum assignments in the GSM 900 MHz and 1800 MHz bands (**refer to Appendix B 1.1.7**) and may well become a feature of mobile broadband assignments in the future.”



Cell C cannot find this reference in the document and therefore finds it difficult to comment on.

4.5 Sub-regulation 2.1.1

"Review of Legislation and Regulations"

The sub-regulation states:

"Section 34 of the Act deals

- Section 34 (16) states that:

The Authority may, where the national radio frequency plan identifies radio frequency spectrum that is occupied and requires the migration of the users of such radio frequency spectrum to other radio frequency bands, migrate the users to such other radio frequency bands in accordance with the national radio frequency plan, except where such migration involves governmental entities or organizations, in which case the Authority—

(a) Must refer the matter to the Minister; and

(b) May migrate the users after consultation with the Minister

It is clear that ICASA has the obligation and authority to plan and implement the migration of users, subject to the approval of the Minister with respect to government entities."

In the absence of any information satisfying the above requirement, Cell C recommends that the migration of governmental entities or organizations must only take place upon the approval of the Minister. Therefore any migration of governmental entities or organizations that is included in the FMP must accompany evidence of referral and consultation by the Minister.

4.6 Sub-regulation 2.1.2

"Section 31 – Radio Frequency Spectrum License"

Cell C is in agreement with the Authority on the right to amend radio frequency spectrum licenses as contemplated in section 31(4) of the ECA. However it is unclear to Cell C when the license amendment will take place, before, during or after the migration has been completed. The Authority only indicates the date of license collection in draft draft notice, sub-regulation 6(2)(c). To avoid instances where a licensee transmits on the new assignment without an amended licence, the amended licence must be included in the notice.

4.7 Sub-regulation 2.3.1

"Radio frequency spectrum rights"

Cell C seeks clarity on procedure on how the Authority is going to manage licensees who migrate to alternate bands but in some instances keep a portion of radio frequency spectrum in the existing band. The radio frequency migration process should not be perceived as an opportunity by migrating licensees for the reward of high value radio frequency spectrum after the migration. Also a change to the application must not automatically entitle a licensee to that radio frequency spectrum where it was previously issued to the said licensee for the purpose of meeting an universal service obligation requirement. In this case the licensee must return the radio frequency spectrum to the Authority. Thereafter, the Authority must make the radio frequency spectrum available to all licensees through the normal application process as contemplated in the March 2011 Radio Frequency Spectrum Regulations.

Therefore Cell C recommends the following addition:

“The process for spectrum migration shall include the following:

- A consultation process....
- **A transparent and detailed methodology in determining the different types of radio frequency spectrum for migration; and**
- **Non-discriminatory assignments to all licensees after the migration is completed.**

4.8 **Sub-regulation 3.1**

“Identification of bands is subject to Frequency Migration”

Cell C believes that any change to an allocation, requires a separate rulemaking process as contained in section 2.2 of this submission. Upon completion of this process, the FMP may be developed describing the conditions for the migration of users that are affected by a change of allocation.

4.9 **Sub-regulation 3.3**

“Time Frame for Migration”

Cell C recommends that the timeframe for the amendment of the radio frequency spectrum license must be specified as well.

Cell C further recommends that the timeframes as specified by the ITU, SADC FAP, policy directives and timeframes associated with the digital migration process be specified in the radio frequency spectrum migration regulations.

4.10 Sub-regulation 3.3.5

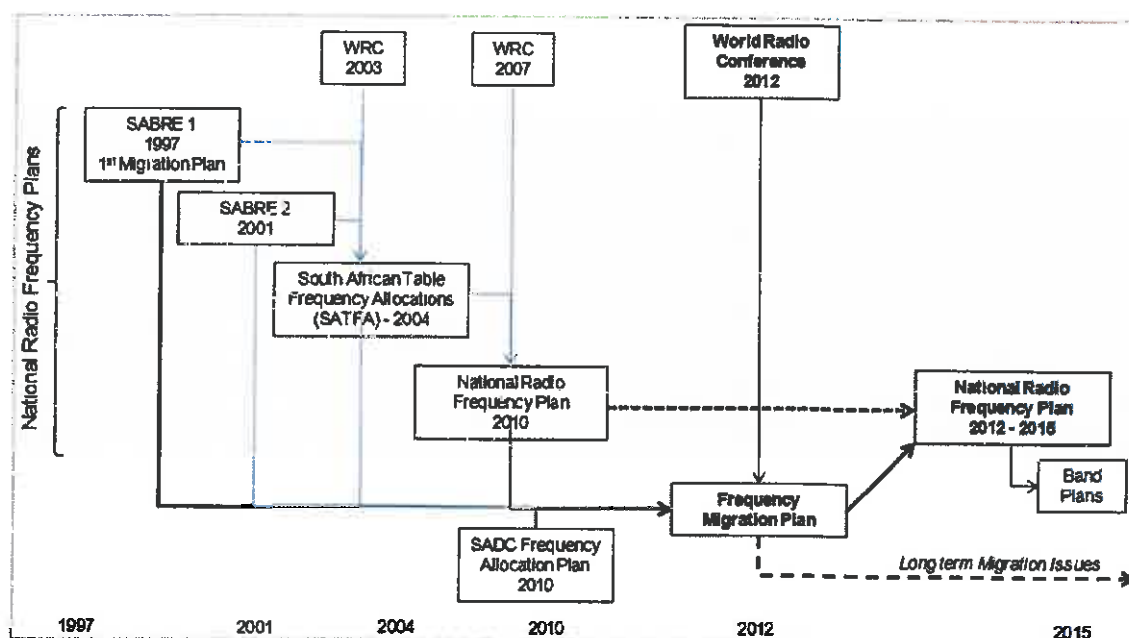
"Conclusions regarding time frame"

The proposed forward looking time frame for radio frequency spectrum migration is 3-5 years from moment of announcement. Cell C recommends that for each migration event, the forward looking timeframe must be specified. There will be instances where the time frames for various migration events will defer depending on readiness of the migrating users. Also in some instances, in-band migration may more likely take less than the proposed 3-5 years.

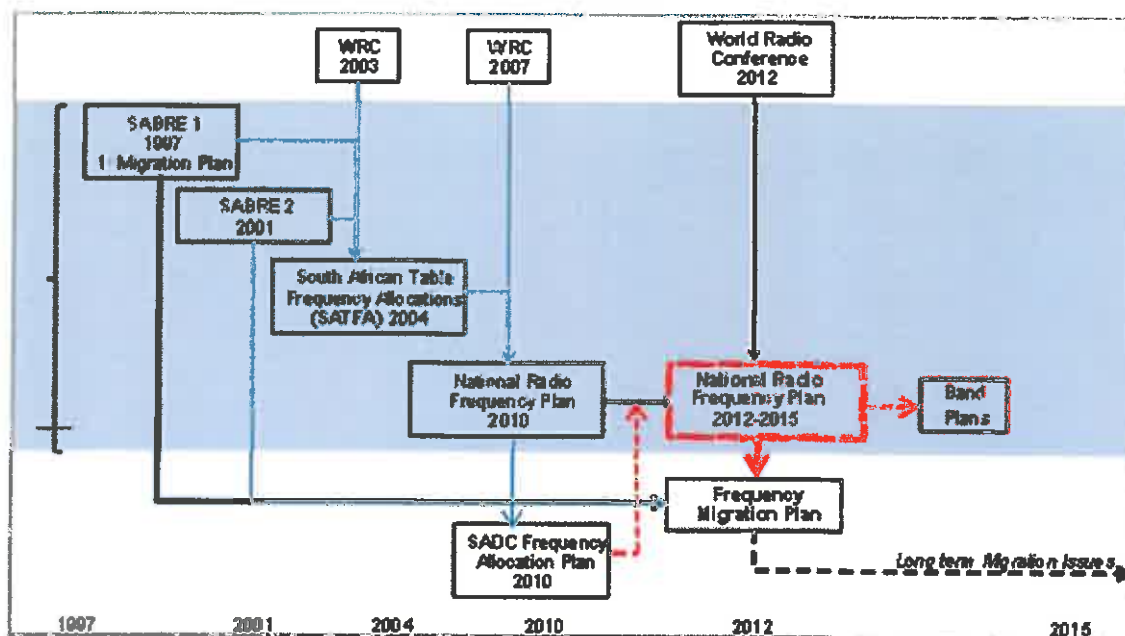
4.11 Sub-regulation 4.1

"Development of the Radio Frequency Migration Plan"

Cell C recommends the following change to the table on the creation of the FMP from:



To:



The reason for the recommended change is that the migration of users that are affected by the change in allocation in the NRFP must occur after the finalization of the amended/updated NRFP (dependent on the approval by the Minister). Therefore Cell C recommends that all migrations that are not dependent on the new NRFP occur soonest. Thereafter a new FMP should be developed to align with the updated/amended NRFP. This procedure would ensure that the migrating licensees are governed within the radio frequency spectrum environment as envisaged in the ECA.

4.12 Sub-regulation 4.3

"Approach to development of FMP"

In developing the FMP, all commentary and recommendations contained in this submission must be taken into account.

4.13 Sub-regulation 4.7

"ITU World Radio Conference resolutions"

South Africa has been a member of the International Telecommunication Union ("ITU") for over a century. Furthermore, South Africa has through the DoC actively participated and contributed in WRC. Therefore Cell C

supports the approach adopted by the Authority to align the NRFP with the WRC 7 and 12 resolutions.

In cases where the WRC resolutions require changes to the allocation in the NRFP and to the typical application in the FMP, the resulting available radio frequency spectrum must be assigned through the normal application process. This is further elaborated in section 4.7 of this submission.

4.14 Sub-regulation 4.9

"Proposed Migration Plan"

Frequency Band (MHz)	Existing Allocation in NRFP 2010 (Applications)	Proposed Allocation/ (Utilization)	Notes on migration/ usage	Cell Comments
	Cell C proposes the removal of "Applications" to avoid confusion with "allocation" as these have distinct uses in terms of ITU definitions.	Cell C proposes that this heading change to "Typical Applications to be consistent with NRFP"		
75.2 – 87.5	MOBILE except aeronautical mobile. (Private and communal repeaters)	Allocate (81 – 81.625 MHz) BTX (Base Transmit) paired with (86.375 – 87 MHz) MTX (Mobile Transmit) for dual frequency (DF) alarms as per SABRE. DF and SF links remain as-is	Migrate in Dual Frequency alarms in line with original SABRE 1 proposed allocation (SABRE proposal, refer 4.4) Other SF / DF links can be maintained for use in private/ communal repeaters	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The Proposal is in line with SABRE 1(refer Future Band Plan).The proposed application is in line with NRFP (refer PART B). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

138 – 143.6	MOBILE, Fixed (SF alarms, SF Mobile, MTX-BTX paired links, Remote controlled industrial apparatus).	Expand allocation for SF Alarms to (140.5 – 141.5 MHz). Mobile 1 MTX-BTX pairing remain as-is	Migrate SF Mobile (141 - 141.5 MHz) out of this band and allocate for SF alarms (New ICASA Proposal) Migrate remote controlled industrial apparatus from 141 - 142 MHz to ISM Band (New ICASA Proposal)	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed application is in line with NRFP (refer PART B). The Authority is proposing a two stage process for allocating the SF alarm band. The first stage is to request a proposal that seeks to determine better spectral efficiency mechanism for this band and the second stage is to migrate SF mobile at 141-141.5 MHz out of this band and allocate for SF alarms. Cell C supports the first stage proposal to conduct feasibility study first which will inform the second stage proposal. The study is essential to provide technical assessment based on the current usage of the band and to determine any benefit arising from the efficient usage of the band. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
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150.05 – 153	FIXED, MOBILE except aeronautical mobile (Alarms, telemetry, SF Mobile and paging)		152.05 – 152.55 MHz should be exclusively allocated to SF alarms. All other users must migrate out of this band	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The Proposal is in line with SABRE 1(refer Future Band Plan).The proposed application is in line with NRFP (refer PART B). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant. It is not clearly explained where all other users (SF Mobile etc.) will be migrated to. The migration event is in accordance with ITU, Regional and SADC Plans is not applicable. The proposed application is in line with NRFP (refer PART B). It is not clearly explained where all other users (SF Mobile etc.) will be migrated to. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
156.4875 – 156.5625	MARITIME MOBILE (distress and calling via DSC),FIXED MOBILE (Maritime Radio Navigation and location (radar), SF mobile in inland areas) (Maritime Radio-navigation and location (radar), SF mobile in inland areas)	Maritime Distress (distress and calling via DSC) SF Mobile (in inland areas)	Migrate any SF mobile(156.375 – 156.7625 MHz) operating inland in the vicinity of water-bodies out of this band (in accordance with ITU Appendix 18)	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed applications is in line with NRFP (refer PART B). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
156.8375 – 174	MOBILE except aeronautical mobile R. Mobile Satellite Services (Earth-to-space)	Migrate BTX-DF (165.55 – 167.4875 MHz) to (172.05 – 173.9875 MHz) swap with the MTX-DF band	Allows for contiguous spectrum for MTX and BTX (currently MTX lies between the BTX assignment	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed applications is in line with NRFP (refer PART B). Cell C recommends that the Authority includes definitive

			s and vice-versa)	timeframes, financial impact (fees) and awareness campaign where relevant.
174 - 223	BROADCASTING (TV)	TV Broadcasting (174 – 214 MHz) T-DAB (214 – 230 MHz) As per SADC FAP proposed common sub-allocation/ utilization	TV Band III (GE-06 applies) Migration from analogue to digital in accordance with planned SADC timelines. T-DAB would be the new service introduced in this band	This migration event is not applicable to the ITU, Regional Plans. Migration from analogue to digital in accordance with SADC time lines. The Proposed application is not in line with NRFP (refer PART A), therefore NRFP needs to be updated. Primary allocation is for Broadcasting TV only. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
214 – 230	BROADCASTING (TV)	T-DAB (214 - 230 MHz) As per SADC FAP proposed common sub-allocation/ utilization	TV Band III (GE-06 applies) Migration from analogue to digital in accordance with planned SADC timelines T-DAB would be the new service introduced in this band	Migration from analogue to digital in accordance with SADC time lines. The Proposed application is not in line with NRFP, therefore update of NRFP (refer PART A). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

235 – 267	BROADCASTING (TV), MOBILE	235 - 238 MHz TV Broadcasting (DTT), 238 - 242.95 MHz PMR, 242.95 - 243.05 MHz International Distress, 243.05 - 246 MHz Low power devices, 246.18 - 254.18 MHz TV Broadcast (DTT) (Channel 13), 254 - 267 MHz PMR as per SADC FAP proposed common sub-allocation/ utilization	Migration as per SADC FAP proposed common sub-allocation/ utilization	The Proposal is in line with NRFP (refer PART A) and SADC Table of Frequency Allocations. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
335.4 - 387	FIXED, MOBILE	335.4-336 MHz/ 346.0-356.0 MHz/ 366.0-380.0 MHz PMR and/or PAMR 336-346 MHz paired with 356-366 MHz Fixed Wireless Access/ PTP/PTMP rural system (as per SADC FAP proposed common sub-allocation/ utilization)	Migrate existing fixed links to above 3 GHz as per SADC proposed common sub-allocation/ utilization	The Proposal is in line with SADC Table of Frequency Allocations. The proposed applications is not in line with NRFP (refer PART B). Cell C believes that there is a requirement for further discussion on the term FBWA and its applicability prior to including such as an application. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

380 – 400	FIXED (380 – 387 MHz), MOBILE (380 – 400 MHz), (Public safety, SAPS, DOD, Army etc.)	380.0-387.0 MHz paired with 390.0-397.0 MHz for digital systems to be used for PPDR.387.0-390.0 MHz paired with 397.0-399.9 MHz. To be used mainly for digital systems (PMR and/or PAMR).(SADC FAP proposed common sub-allocation/ utilization)	Consolidate all public safety services into this band, migrating all users falling into this category into this band (New ICASA proposal). Other links to be migrated out as per SADC FAP proposed common sub-allocation/ utilization	The Proposal is in line with SADC Table of Frequency Allocations. The proposed application is in line with NRFP (refer PART B & C). The Authority proposes that this band (380-400MHz) be exclusively reserved for public safety. The risks of not aligning the 480-400 MHz band are:1) some users in the band may continue to experience Continental interference 2) current spectrum may be used inefficiently 3) Current spectrum may be used inefficiently. Cell C supports the efficient use of radio frequency spectrum. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
405 – 430	FIXED, Mobile except aeronautical mobile, (Government services, Mobile Data and public trunking)	PMR and/ or PPDR,(SADC FAP proposed common sub-allocation/ utilization), Public digital trunking only (New ICASA proposal)	Migrate government services (especially SAPS) to public safety band 380 – 400 MHz, Mobile Data - Migrate Mobile Data users out of this band, Band reserved for Public	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed allocation is in line with NRFP (refer PART C). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

440 – 450	FIXED, Mobile except aeronautical mobile.(Short range business radio and PMR)	Short range business radio and PMR (New ICASA proposal). Other allocations stay as-is	Digital Trunking (New ICASA proposal) Other users to be migrated out of the sub-band for Short-range business radio (440 – 440.1/ 445 – 445.1 MHz) (New ICASA proposal)	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed application is in line with NRFP (refer PART C). It is not clearly explained where all other users will be migrated to. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
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450 – 470	FIXED, MOBILE. (Trunked Mobile Railways, Mines etc.)	Mobile (IMT) as per WRC- 07 (Res. 224)	Migrate existing users out of this band	The band is also identified for IMT as per WRC-07 (Res. 224).The proposed application is not in line with NRFP (refer PART C). The Proposal is Supported. Change to NRFP required; refer to Cell C comments in section 2.2 of this submission. The radio propagation characteristics of the band make it highly sought after for mobile radio systems since it provides coverage ranges of up to about 30 km and some in-building penetration. It is also a band that has been identified across Europe for digital services according to a common spectrum configuration plan. Aligning spectrum between 450 and 470 MHz will expand its social and economic benefits and increase the efficiency of its use, allowing users to gain renewed benefit from assignments in this band. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
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694 – 790	BROADCASTING, G, RADIO ASTRONOMY	IMT (Terrestrial) (WRC-12)	Digital Dividend 2; DTT bands between 470 – 690 MHz. Planned migration of TV out of this band by 2015 .Migrate studio links out. Migrate self-help stations below 692 MHz	This is in line with WRC 12 resolutions. The proposed allocation is not in line with NRFP (refer PART C). NRFP will require an update. The Authority makes reference to an alignment with the on- going efforts within 800MHz band as defined in Government Gazette 34872. Refer to Cell C comments in section 2.4 of this submission.
790 – 862	FIXED, BROADCASTING G, MOBILE except aeronautical mobile. (TV Broadcast including fixed links (Secondary transmitter links))	IMT (Terrestrial) (WRC-07)	Digital Dividend 1; DTT bands between 470 – 690 MHz. Align with the on- going efforts within the 800 MHz band as defined in Notice 911 of 2011 Govern- ment Gazette 34872. Migrate studio links out. Migrate self-help stations below 692 MHz	This is in terms of ITU WRC-07 resolutions. The proposed application is in line with NRFP (refer PART C). The migration plan is a ICASA proposal where the migration should be aligned with the on- going efforts within 800MHz band as defined in Government Gazette 34872. See Cell C comments in section 2.4 of this submission.

862 – 890	FIXED,MOBILE except aeronautical mobile (Wireless audio (863-865 MHz),Fixed links (868.1–876 MHz), RFID (865 – 868 MHz),RFID (869.4- 869.65 MHz) Alarms (868.6 – 868.7 MHz, 860.25 – 869.3 MHz, 869.65 – 869.7 MHz) Wireless Access Services (824-849 MHz paired with 869-894 MHz) Mobile (880-890 MHz paired with 925-935 MHz))	Mobile (IMT) (as per SADC FAP proposed common sub-allocation/ utilization)	Migrate to IMT as per SADC FAP proposed common sub-allocation/ utilization to facilitate development of harmonized channeling arrangement	Applicable to ITU, and Regional Plans. The proposal is in line with SADC Proposed Table of Frequency Allocations. The proposed application change may require change to NRFP. Cell C would like to bring to the Authority's attention that 880-890MHz paired with 925-935MHz band is assigned to Cell C and not to Neotel as outlined at 4.11.16. Mobile allocations must remain as is. Refer to comments in section 2.4 wrt Government Gazette 34872.
890 – 942	MOBILE except aeronautical mobile ,(Mobile (890-915 MHz paired with 925-935 MHz).Several RFID systems (915.1 – 921 MHz), (GSM900 band)	Allocate 921 – 925 MHz for GSM-R (New ICASA proposal).All other allocations maintained as-is	Allocate 921 – 925 MHz to GSM-R. (SABRE 1 proposal to allocate this band for Digital Trunking was never implemented).Spectrum re-farming when deemed required may be carried out based upon defined process	The proposed application, GSM-R is not in line with NRFP (refer PART C), therefore a change to the NRFP. Cell C would like to bring to ICASA's attention that 890-915MHz/935-959Mhz band is assigned to Vodacom, MTN and Cell C and must be corrected in 4.11.17. Cell C encourages re-farming of radio frequency spectrum assignments as these results in more efficient use of the assignments.

942 – 960	MOBILE except aeronautical mobile.(GSM 900)		No migration planned Spectrum re-farming when deemed required may be carried out based upon defined process	The frequency band is in line with NRFP (refer PART D). However Cell C recommends the harmonization of the 900 MHz band as contained in section 2.3 of this submission.
1350 – 1375 paired with 1492 – 1517.1375 – 1400 MHz paired with 1427 – 1452	FIXED (Fixed low capacity PTP DF links)	Rural BFWA (New ICASA proposal)	Allocate to rural BFWA; maintain existing links where required	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed application is not in line with NRFP (refer PART D). Cell C believes that there is a requirement for further discussion on the term rural BFWA and its applicability prior to including such as an application.
1452 – 1492	Insert "FIXED" BROADCASTING G BROADCASTING G-SATELLITE (T-DAB and S-DAB (L band))	FWBA/ PTP/ PMP/ LMR (New ICASA proposal)	Currently allocated to T-DAB (1452 – 1479.5 MHz) and S-DAB (1479.5 – 1492).Prop ose to align allocation with ITU Region 1 (New ICASA proposal)	The proposed application is in line with NRFP (refer PART D). . See comments wrt BFWA above. C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

1518 – 1525	FIXED,MOBILE-SATELLITE (space-to-earth)	Band is currently not occupied; potential application for LMR repeaters. (New ICASA proposal)	Migrate in fixed links for LMR repeaters, band could also be used for outside-broadcasting links currently operating in 2300 – 2450 MHz (New ICASA proposal)	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed applications is not in line with NRFP (refer PART D). Therefore a change to the NRFP is required.
1525 – 1559	(1525 – 1530 MHz) SPACE OPERATION (space-to-earth),FIXED MOBILE-SATELLITE (space-to-earth).Earth exploration satellite Mobile except aeronautical mobile.(Mobile satellite services)	potential application for LMR repeaters (New ICASA proposal)	Migrate in fixed links for LMR repeaters, band could also be used for outside-broadcasting links currently operating in 2300 – 2450 MHz (New ICASA proposal) (refer to 4.11.22) No migration planned	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed application is in line with NRFP (refer PART D). C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
	(1530 – 1535 MHz) SPACE OPERATION (space-to-earth).MOBILE-SATELLITE (space-to-earth).Earth exploration satellite Mobile except aeronautical			

	mobile. Fixed (Mobile satellite services)			
1668 – 1675	(1535 – 1559 MHz) MOBILE- SATELLITE (space-to-earth) (1668 – 1668.4 MHz) MOBILE SATELLITE (earth-to-space) RADIO ASTRONOMY SPACE RESEARCH (passive) (1668.4 – 1670 MHz) METEOROLOGICAL AIDS MOBILE SATELLITE (earth-to space) RADIO ASTRONOMY (1670 – 1675 MHz) METEOROLOGICAL AIDS MOBILE MOBILE SATELLITE (earth-to-space) FIXED, MOBILE (GSM1800 band)		No migration planned Propose to align allocation with ITU Region 1 to IMT (satellite) – would open up possibilities of introducing Fixed links.(New ICASA proposal)	Proposal in line with ITU Region 1, The band is identified for satellite component of IMT (Res.225), The proposed application is in line with NRFP (refer PART D). C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
1710 – 1785 paired with 1805-1880			No migration planned. Spectrum re-farming when deemed required may be carried out based upon	The Frequency Band is in Line with NRFP (refer PART D). Cell C encourages re-farming of radio frequency spectrum assignments as these results in more efficient use of the assignments.

			defined process	
1880 – 1900	FIXED , MOBILE (Cordless DECT phone)	FWA, (SADC FAP proposed common sub-allocation/ utilization)	Currently under use by Telkom in a WLL configuration. Allocate this band to BFWA	Cell C believes that this migration event is not applicable to ITU, Regional Plans. The proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application is not in line with NRFP (refer PART D). There is a need to change the NRFP. Cell C believes that there is a requirement for further discussion on the term BFWA and its applicability prior to including such as an application. There is a competitive impact on all licensees, any change of usage/application or USO related assignment means the return of spectrum to the Authority for reassignment to all licensees on a fair and transparent basis.
1920 – 1980 paired with 2110 – 2170	FIXED, MOBILE (Current 3G band)		No migration planned. Spectrum re-farming when deemed required may be carried out based upon	Cell C encourages re-farming of radio frequency spectrum assignments as these results in more efficient use of the assignments.

			defined process	
1980 – 2010 paired with 2170-2200	FIXED,MOBILE- SATELLITE (Earth-to-space) (Fixed Links (DF), IMT (Satellite))	Fixed Links (DF), BFWA (New ICASA Proposal)	Migrate in Fixed links (DF) from other bands; consider for BFWA (New ICASA proposal)	Cell C believes that this migration event is not applicable to ITU, Regional and SADC Plans. The proposed application is not in line with NRFP (refer PART D). Cell C believes that there is a requirement for further discussion on the term BFWA and its applicability prior to including such as an application.
2285	(Fixed Links)	BFWA(New ICASA proposal)	Migrate in Fixed links (DF) from other bands.(refer to 4.11.26)	See comment on BFWA above.
2025 – 2110 paired with 2200 - 2285	FIXED (Fixed links)	Fixed Links (DF), BFWA (New ICASA Proposal)	Fixed links – currently under- utilized. Migrate in Fixed links (DF) from other bands	See comment above on BFWA.
2110 – 2170	FIXED, MOBILE (Current 3G band)		No migration planned. Spectrum re-farming when deemed required may be carried out based upon defined process	Cell C encourages re- farming of radio frequency spectrum assignments as these results in more efficient use of the assignments

2290 – 2300	FIXED	BFWA (as per SADC FAP proposed common sub-allocation/ utilization)	Band currently unused; can be allocated for BFWA as per SADC FAP proposed common sub-allocation/ utilization	Cell C believes that this migration event is not applicable to ITU, Regional Plans. The proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application is not in line with NRFP (refer PART D). Cell C believes that there is a requirement for further discussion on the term BFWA and its applicability prior to including such as an application.
2300 – 2450	FIXED, MOBILE, Amateur, (Fixed links (2307 – 2387 MHz) paired with (2401 – 2481 MHz). Several outside broadcasting links. ISM band (2400 – 2483.5 MHz))	IMT (Terrestrial) 2300 – 2400 MHz as per SADC FAP proposed common sub-allocation/ utilization	Migrate existing fixed links and OB links above 3 GHz, retain ISM,	Cell C believes that this migration event is not applicable to ITU, Regional Plans. The Proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application is in line with NRFP (refer PART D). The proposal is supported. C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
2500 – 2690	2500-2520 MHz, FIXED, MOBILE except aeronautical mobile	BFWA, Mobile IMT, (as per SADC FAP proposed common sub-allocation/ utilization)	Currently being used by Sentech (2500 – 2550 MHz) and WBS (2550 – 2565 MHz). 125 MHz available for assignment	Cell C believes that this migration event is not applicable to ITU, Regional Plans. The proposal is in line with proposed SADC Table of Frequency Allocations. The proposed applications is in line with NRFP (refer PART D). See Cell C

3400 – 3600	2655-2690 MHz, FIXED, MOBILE except aeronautical mobile, Radio astronomy	FIXED, MOBILE except aeronautical mobile	BFWA, Mobile IMT, (as per SADC FAP proposed common sub-allocation/ utilization)	Align with the on-going efforts within the 800 MHz band as defined in Notice 911 of 2011 Government Gazette 34872. Band needs harmonizing in SADC for IMT; channeling plan to be developed comments in section 2.4 of this submission wrt GG 34872. C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant. Cell C believes that this migration event is not applicable to ITU, Regional Plans. The proposal is in line with proposed SADC Table of Frequency Allocations. The proposed applications are in line with NRFP (refer PART D). See Cell C comments in Section 2.4 of this submission wrt GG 34872. C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant. There is a competitive impact on all licensees. Any change of usage/application means return of spectrum to the Authority for reassignment to all licensees on a fair and transparent basis. It is not fully explained where the DF Alarms are migrated from.
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3600 – 4200	FIXED	(3600-4200 MHz) Fixed services (PTP)	Migrate VSAT to Ku band, and use 3600 – 3800 for BFWA as per SADC FAP proposed common sub-allocation/ utilization	The Proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application change is not in line with NRFP (refer PART D). The NRFP needs to be changed.). Cell C believes that there is a requirement for further discussion on the term BFWA and its applicability prior to including such as an application. Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.
	FIXED-SATELLITE (space-to-earth)	(3600-4200 MHz) Fixed-satellite (space-to-Earth) (PTP/VSAT/S NG)		
	(Satellite (VSAT, downlink), Terrestrial backhaul)	(3600-3800 MHz) Broadband Fixed Wireless Access (BFWA) as per SADC FAP proposed common sub-allocation/ utilization		
5150 – 5350	(5150 – 5250 MHz)	Wireless Access Systems / RLAN	License exempt; Wireless Access Systems / Radio Local Access Network (WAS & RLAN) indoor use only. as per Notice 184 of 2011 Government	The proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application is in line with NRFP (refer PART D).

			t Gazette 34172 (previously Notice number 944 of 2008 in Governmen t Gazette 31321)	
	AERONAUTICA L RADIONAVIGAT ION, FIXED- SATELLITE- SERVICE (Earth-to-space), Mobile except aeronautical mobile, (Wireless Access (short range)), (5250 – 5255 MHz), SPACE RESEARCH. Mobile except aeronautical mobile. (5255 – 5350 MHz). EARTH EXPLORATION SATELLITE (active) (5470 – 5570 MHz)	As per SADC FAP proposed common sub- allocation/ utilization		
5470 – 5725	MARITIME RADIONAVIGAT ION	Wireless Access Systems / RLAN As per SADC FAP proposed common sub- allocation/ utilization	No migration planned; as per as per Notice 184 of 2011 Governmen t Gazette 34172 (previously	The Proposal is in line with proposed SADC Table of Frequency Allocations. The proposed allocation is in line with NRFP (refer PART D.

5725 – 5830	Mobile except aeronautical mobile, EARTH EXPLORATION SATELLITE (active), SPACE RESEARCH (active), RADIOLOCATION, (Maritime radio navigation (radar) and Wireless Access (short range)), (5570 – 5650 MHz), MARITIME RADIONAVIGATION, (5650 – 5725 MHz), Amateur, Space Research (deep space) FIXED-SATELLITE (earth-to-space), RADIOLOCATION, Amateur, (ISM, Amateur, SRD)		Notice number 944 of 2008 in Government Gazette 31321)	
5850 -5925	FIXED	(5850-6425 MHz) Fixed-satellite uplinks (PTP/VSAT/SNG)/ temporary Outside	No migration for South Africa; maintain for ISM as per Notice 184 of 2011 Government Gazette 34172 (previously Notice number 926 of 2008 in Government Gazette 31290).	Cell C believes that this migration event is not applicable to ITU, Regional, and SADC Plans. NRFP must be updated if required by demand for fixed and mobile services. Cell C believes that this migration event is not applicable to ITU and Regional Plans. The proposal is in line with proposed SADC Table of Frequency Allocations. The

		broadcast links		proposed application is in line with NRFP (refer PART D). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant for immigration of broadcast links.
	FIXED-SATELLITE (earth-to-space) Mobile	(5850-5925 MHz) FIXED links (5725-5875 MHz) ISM, as per SADC FAP proposed common sub-allocation/ utilization		
5925 – 6700	(Upper C-band (VSAT, Satellite PTP links), ISM (5725 – 5875 MHz)) FIXED	5925 – 6425 MHz Fixed links		Proposal is in line with proposed SADC Table of Frequency Allocations. The proposed application is in line with NRFP (refer PART D).
	FIXED-SATELLITE (earth-to-space)	6425 – 7110 MHz Fixed links, as per SADC FAP proposed common sub-allocation/ utilization		
10700 – 11700	(Fixed links/ VSAT, FSS, SNG feeder links) - FIXED, FIXED-SATELLITE (space-to-earth)/(earth-to-space), (Ku-band satellite)	as-is	Migrate VSAT links into this band as per SADC FAP proposed common sub-allocation/ utilization Other allocation remains as-	The Proposal is in line with SADC Table of Frequency Allocations. The Frequency band is line with NRFP (refer PART B). Cell C recommends that the Authority includes definitive timeframes, financial impact (fees) and awareness campaign where relevant.

			is	
12290, 16420		Reserved for safety related calling as per WRC-03 Res. 352		
15400 15700	—	Radio location service as per WRC-07 Res. 614		
40000 above	—	Allocate for high capacity PTP links		

4.15 Regulation 5

"Bands planned for IMT"

Cell C supports the bands planned for IMT services as these are aligned to the WRC resolutions. The formulation of these resolutions resulted from the unanimous observation by all three ITU Regions that there is a need to free up radio frequency spectrum to satisfy the exponential demand for mobile wireless data services. Furthermore Cell C believes that the making available of more radio frequency spectrum for IMT services, the more the Broadband 2030 vision becomes a reality. It must be noted that in Region 1, the African environment is dominated and continue to do so by mobile wireless services. This is so due to mobile wireless services been a substitute for fixed services and the characteristics of the elements associated with mobile wireless network.

5. CONCLUSION

- 5.1 Cell C recognizes that the FMP and migration regulations are complex regulations that intend to correct and align radio frequency spectrum applications is use by licensees with the 2010 NRFP, the outstanding relevant SABRE 1 and 2 requirements and the SADC FAP. In finalizing the regulations it would be judicious to conduct a workshop and an awareness



campaign. This would ensure all affected licensees are aware of the migration intention and the impact thereof.

- 5.2 Cell C encourages the Authority to use this process to address other outstanding matters like in-band migration of existing licensees in the 900 MHz band. This would be in line with the Objects of the ECA.
- 5.3 In finalizing the FMP and the migration regulations, the migration of licensees including government entities and organizations must follow the process as prescribed in the ECA.
- 5.3 All references to the 800/2600 MHz radio frequency bands and Government Gazette 34782 should be removed from these draft regulations as this process is incomplete and dependent on finalization of radio spectrum policy.
- 5.4 Lastly, the completion of the FMP and the migration regulations must not result in some licensees been awarded high value radio frequency spectrum for migrating. Furthermore, licensees should not benefit from a change in application with their existing assignment.

ENDS



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**E-GSM 900 and P-GSM 900 in band migration and
harmonisation**
TECHNICAL AND ECONOMIC REPORT
April 2011

MB



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Cell C 900MHz Spectrum

In the second half of 2001 Cell C was formally issued a frequency spectrum licence by the Independent Communications Authority of South Africa (ICASA).

At that time Cell C was in possession of 2x10 MHz of 1800 MHz spectrum. This spectrum was not unencumbered as Cell C's usage was shared with the Department of Defence in metropolitan areas and resulted in temporary spectrum allocation being used by Cell C to mitigate interference. A further 2x2 MHz of 1800 MHz spectrum was allocated to Cell C in October 2004 bringing the allocation to 2x12 MHz.

The assignment on Primary GSM (PGSM) 900 MHz frequency consisted of 2x2.4 MHz, constituting 12 channels of which only 5 channels were usable (the rest being assigned as guard band). The allocation was altered by ICASA in November 2002 to 2x1.4 MHz of Primary GSM, constituting 7 channels (excluding guard bands).

On the Extended GSM (EGSM) 900 MHz frequency, Cell C was awarded with 2x4.2 MHz, constituting 21 channels. At that time, handset support for EGSM was extremely limited and resulted in users having limited access to the Cell C network. In 2003, ICASA granted further spectrum in the EGSM band to Cell C (increase to 2x6.8 MHz), and again in 2004 (increase to 2x9.6 MHz).

Although Cell C was in possession of 900 MHz spectrum at its launch, this spectrum was not efficiently usable; the company decided to formulate its nominal plan based on the propagation model for the 1800 MHz band and to sign a National Roaming Agreement with Vodacom to provide extended coverage and service to customers with 900 MHz single band handsets and non-EGSM capable.

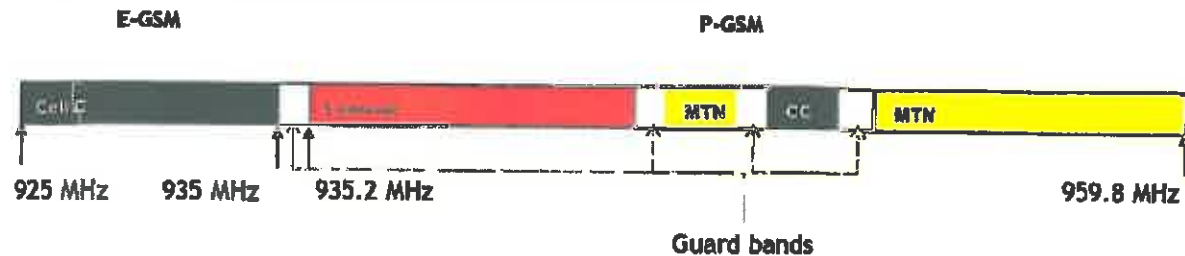
The changes for the usage of 900 MHz spectrum required costly upgrades to the Cell C 1800 MHz network but most importantly the usage of the 7 channels in PGSM resulted technically and economically unviable for the company.

Due to the technical limitations and commercial unviability of the usage of PGSM frequency together with limited handset support for EGSM, Cell C requested from ICASA 2x4 MHz of 900 PGSM MHz spectrum in 2003. However, this required Vodacom and MTN to each relinquish 2x2 MHz PGSM, though Cell C offered each 2x2 MHz of EGSM in return. This proposal did not progress due to the fierce resistance by Vodacom and MTN.

Vodacom and MTN were initially assigned 2x10 MHz PGSM frequency. By 2003, that had increased to 2x11 MHz each, which continues to be the current allocation. Cell C's current allocation remains as at 2004, with the bulk of it in EGSM.

MBE

Current 900 MHz band spectrum allocation



Economic Impact of the non-usability of PGSM spectrum

In order to provide nationwide Broadband coverage Cell C has successfully re-farmed the 900MHz band to clear one carrier for the provision of UMTS services. The remaining spectrum in the band is being used for the provision of GSM services.

As at the end of Q1 2011, Cell C has over 2,400 HSPA+ towers/sites in the country, of which around 1,450 sites are active. Cell C currently has 2,500km of its own dedicated fibre, and is actively growing their fibre network to complement its HSPA+ network. These figures translate on coverage above 40% of the national population.

The limitation in the usage of its assignment in PGSM is negatively impacting Cell C in its objective to provide nationwide Broadband connectivity in an economic manner with the objective to bridge the digital divide.

Cell C HSPA+ Release 7 provide an improved raw spectral efficiency of 4.32 bps/Hz by including downlink MIMO operation, higher-order modulation, and protocol improvements specifically allowing a high number of "always on" users to be supported in the network.

The utilisation of HSPA+ Release 7 in the 7 PGSM channels would therefore allow Cell C to provide an increased throughput of 6Mbps (200 KHz x 7 channels x 4.32 bps/Hz), which would enable incremental connectivity to 24 more simultaneous users **per site** at 250 Kbps in the rural areas.

Technical limitation for the efficient usage of PGSM spectrum

Cell C has explored the possibility to use the 7 channels in PGSM using SDR (Software Define Radio). The current software defined radio (SDR) base stations support typically 20MHz or 25MHz continuous spectrum and the centre frequency of this spectrum can be adjusted with parameters. Within the spectrum covered by the SDR an operator can freely allocate several GSM channels and/or UMTS carrier(s).

If the difference between the lowest and the highest frequency used by an operator is greater than the supported spectrum, the operator needs to deploy an additional expensive radio unit for each cell or site where an operator needs to use frequencies in lower and upper blocks.

Both MTN and Vodacom can therefore deploy SDR solution to support their full assignment in the 900MHz band, whilst Cell C needs to deploy two RF units to be able to support its EGSM spectrum together with the 7 channels of PGSM spectrum.

NOA



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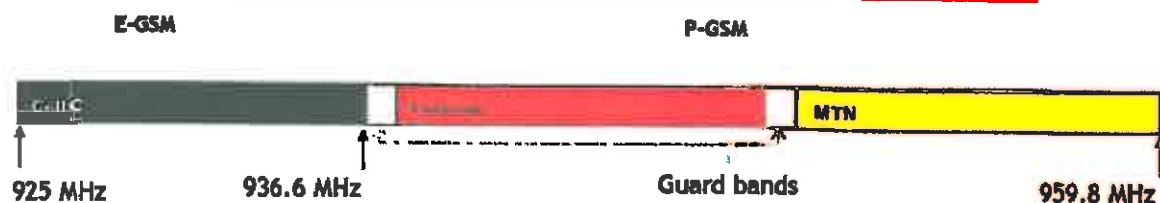
Even if the SDR base station could theoretically support wider spectrum it is likely that SDR base station would cause interference in the frequencies between the two blocks covered. It is therefore recommended to use contiguous spectrum to minimise the interference effects.

Proposed Solution

The inefficient allocation of the 900MHz spectrum can be resolved with the implementation of two simple measures:

1. To establish 200kHz guard band between operators instead of 2x200kHz
2. To divide the 35MHz GSM spectrum (P-GSM + E-GSM) into three blocks each having 57 channels with 200kHz bandwidth

Optimal 900 MHz band spectrum allocation



The fact that all the operators are currently investing in the band to achieve the required efficiency makes this the perfect moment to finally migrate and harmonize the band.

MTN has stated its intention to re-farm the spectrum in the band and approached Cell C in December 2010 to obtain an agreement on the usage of the guard bands for ICASA's review and approval.

Mr Shane Hibbard, Managing Executive of Mobile Engineering of Vodacom stated in his presentation during the Spectrum Regulation and Management Workshop hosted by CRASA on the last week of March, that Vodacom intends to re-farm the band where it make sense. He highlighted the benefits of UMTS in the 900 MHz band and revealed that Vodacom has already some live sites operating in UMTS 900.

Case Study - Harmonization in Finland for GSM900

In July 2007 the GSM900 band was divided into six blocks, with each of the three operators using one block in PGSM band and one block in EGSM band. This original split of frequencies was implemented to compensate the disadvantages of having EGSM frequencies with devices not readily available.

The Finnish operators, as pioneers of UMTS900, realised in early days that the previous split in the frequency allocation was not technically or costly efficient for the rollout of the new technology. The regulator intervened to expedite the process and decided to implement the harmonization.

- In the first stage the operators were awarded with spectrum previously used by CT-1 cordless phone.



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- In stage two, all three operators got continuous frequency bands (at least 53 channels) that allowed UMTS900 deployment.
- In the third stage, adjustments in the allocations for GSM-R and EISCAT systems resulted in a successful harmonisation with two operators operating in PGSM band with 57 channels each and the third operator operating in EGSM and PGSM band with 58 channels.

The Finnish exercise was more complex than what it would be in South Africa due to the requirement for re-planning. In Finland, the harmonization was successfully implemented in less than 6 months, resulting in an average y.o.y data consumption growth of 400% in 2009.

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