

Framework for Harmonisation of Radio Frequency Spectrum for Public Protection and Disaster Relief (PPDR) in SADC

Edition 2020

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ACRYOMNS

BBDR	Broadband Disaster Relief
CEPT	Conference of Postal and Telecommunications Administrations
DMR	Digital Mobile Radio
DR	Disaster Relief
ECC	Electronic Communications Committee
ETSI	European Telecommunications Standards Institute
FAP	Frequency Allocation Plan
IMT	International Mobile Telecommunications
ITS	Intelligent Transportation Systems
ITU-R	International Telecommunications Union – Recommendation
MESA	Mobility for Emergency and Safety Applications
PP	Public Protection
PPDR	Public Protection and Disaster Relief
RA	Radiocommunication Assembly
SADC	Southern African Development Community
SDMA	SADC Disaster Management Plan
SDR	Software Defined Radios
TEDS	TETRA Enhanced Data Services
TETRA	Terrestrial Trunked Radio
TIA	Telecommunications Industry Association
WRC	World Radiocommunication Conference

DEFINITION OF TERMS

Public Protection (PP) Radiocommunication shall mean Radiocommunications used by responsible agencies and organisations dealing with maintenance of law and order, protection of life and property, and emergency situations.

Disaster Relief (DR) Radiocommunication shall mean Radiocommunications used by agencies and organisations dealing with a serious disruption of the functioning of society, posing a significant, widespread threat to human life, health, property or the environment, whether caused by accident, nature or human activity, and whether developing suddenly or as a result of complex, long-term processes.

Member State shall mean a member state that is a member of the Southern African Development Community

1.0. INTRODUCTION

All nations are, at some point in time, subject to natural disasters which could come in the form of earthquakes, floods, fires, droughts, etc. as well as manmade disasters, such as, acts of terrorism or industrial accidents (e.g. incidents at nuclear power stations). When these disasters happen, it is important that public safety agencies (fire, police, ambulance, coast guard, customs and border patrol, defence force, etc.) are able to communicate with each other. In addition, during large scale disasters, the national public safety agencies need to also communicate with regional and international aid organisations. A national disaster management plan is required for successful achievement of such communications.

A national disaster management plan should take into consideration that the normal day-to-day communication systems could be crippled or seriously damaged during disasters, therefore, cannot rely solely on these systems. Radiocommunications, both terrestrial fixed and mobile as well as satellite services (e.g. those provided by Inmarsat) will play a key role in any national disaster management plan (see for example International Telecommunications Union-Radiocommunication(ITU-R) Recommendation ***M.1854***[1] and ITU-R Report ***M.2149***[2]). Amateur and amateur satellite services could also add to the redundancy of a national disaster management plan (see for example ITU-R Report ***M.2085***[3]).

Radio frequency spectrum is a key element of any national disaster management plan. New and advanced Radiocommunication Public Protection and Disaster Relief (PPDR) systems and services, which require more bandwidth, are being developed and frequency identification and harmonisation should, therefore, consider these developments.

At a regional level, it is also important to have a Southern African Development Community (SADC) Disaster Management Plan (SDMP) in order to allow SADC members to be able to support each other during such disasters on a coordinated and planned basis. This becomes difficult considering that each Member State has its own systems, procedures and agencies in place. Interoperability of networks and systemsalso becomes a critical aspect of a regional disaster management plan. A regional disaster management plan should also include early warning systems and mechanisms to allow effective distribution of information, which could assist in alleviating the impact of disasters.

[1] ITU-R Recommendation ***M.1854***: Use of mobile-satellite service in disaster response and relief

[2] ITU-R Report: Use and examples of mobile-satellite service systems for relief operation in the event of natural disasters ***M.2149*** and similar emergencies

[3] ITU-R Report ***M.2085***: Role of the amateur and amateur-satellite services in support of disaster mitigation and relief

Another issue to be addressed in a regional disaster management plan is the free circulation of equipment during disaster situations, or at least minimising the regulatory requirements to the extent possible, to ensure speedy importation of these systems to be used in disaster situations. This matter is addressed extensively in ITU-R Recommendation ***M.1637***[4].

This Framework addresses only one critical element, namely; the harmonisation of radio frequency spectrum that could be used in the context of PPDR, as defined by the ITU.[5]

The benefits brought by spectrum harmonisation are increased potential for interoperability thereby affording a broader market base and increased volume in equipment production resulting in economies of scale and expanded equipment availability, improved spectrum management and planning, enhanced cross-border coordination and circulation of equipment. In addition, the following benefits could be accrued from the harmonisation:

a) Economies of scale and scope can reduce unit costs of development and production of equipment to meet PPDR communication needs;

b) Enhanced ability for multiple countries to respond to catastrophes that impact them jointly can help to save lives and protect property; and

c) Enhanced ability of one country to lend assistance to another again in the event of a natural disaster or subversive acts has obvious advantages in terms of safety of life and protection of property.

A national or regional disaster management plan, although addressed to some extent in this document, supports a holistic and integrated involvement of all the stakeholders involved in PPDR in the Region.

2.0. BACKGROUND

In the course of developing the SADC Radio Frequency Spectrum Allocation Plan (SADC FAP 2010)[6], CRASA Members identified the need to harmonise, throughout SADC, appropriate frequency bands for addressing PPDR requirements. It was also

[4]Global cross-border circulation of Radiocommunication equipment in emergency and disaster relief situations

[5]***(PPDR)*** - definitions

PPDR supports a wide range of public services such as the maintenance of law and order, protection of life and property, disaster relief and emergency responses. It is however important to define PPDR as used in the context of this framework.

PPDR has two components namely Public Protection (PP) radiocommunications and Disaster Relief (DR) radiocommunications and these are defined by the ITU-R (see ITU-R Report M.2033, Annex 2):

[6] SADC FAP 2010 was adopted by SADC ICT Ministers' meeting in Luanda, May 2010

agreed that there is a need to specify frequency bands for narrowband, wideband and broadband PPDR applications. It should be noted that PPDR can be applied on a national and international level; whereas every SADC Member State has its own PPDR systems and procedures, ultimately the goal is to have interoperable and harmonised systems at a regional level, and beyond.

2.1. Tampere Convention

The importance of telecommunications in disaster mitigation and relief has been acknowledged and actively addressed internationally for at least two (2) decades. The International Conference on Disaster Communications held in Geneva in 1990 addressed the power of telecommunication systems in disaster recovery and response. In 1991, the Tampere Declaration on Disaster Communications called for an International Convention on Disaster Communications, which lead to the adoption, on 18th June 1998, of the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations. The Tampere Convention acknowledged, amongst others, the role of radio frequency spectrum as a telecommunication resource for disaster mitigation and relief and as such, also listed spectrum as one of the potential regulatory barriers for the provisioning of telecommunication assistance during disaster mitigation and relief, a barrier which must be removed.

A second and third Tampere Conferences on Disaster Communications were held in 2001 and 2006, respectively. The Tampere Convention entered into force on 8 January 2005.

The Tampere Convention is an important treaty instrument that provides guidance to the development and implementation of multinational and bilateral agreements pertaining to the overall use of telecommunication resources for disaster mitigation and relief. ***Resolution 36 (Rev. Guadalajara, 2010)***[7] also addressed the importance of accession and implementation of the Tampere Convention as a matter of urgency. ***Resolution 136*** (***Dubai, 2018***)[8] encourages Member States to, amongst others, satisfy the temporary need for additional spectrum in emergency and disaster relief situations and to develop tools and procedures for the effective coordination and operation of telecommunications and Information and Communications Technologies (ICTs) in disaster situations. Member States should also address issues of interoperability of satellite and terrestrial networks to further the goals of PPDR.

[7] Resolution ***36 (Rev. Guadalajara, 2010)*** of the Plenipotentiary Conference, on telecommunications/ information and communication technology in the service of humanitarian assistance

[8] Resolution ***136 (Dubai, 2018)*** of Plenipotentiary Conference, on the use of telecommunications/ information and communication technologies for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief

The development of detailed procedures and systems that will facilitate the use and interworking of telecommunication systems in the SADC region, particularly during disaster relief operations by the various national, regional and international organisations involved in such relief operations, should be developed in line with the Tampere Convention, the Resolutions mentioned above as well as national laws and regulations as applicable. These procedures and systems could also include the current and future use of telecommunication systems and procedures for early detection and warning systems and dissemination of information throughout the SADC region. Additional information on designing national and regional emergency communications plans can be found in Best Practice on Emergency Telecommunications *(BDT publication, 2007)* and the Compendium of ITU'S Work on Emergency Telecommunications *(Inter-Sectorial publication, 2007)*.

3.0. PPDR FRAMEWORK

The Public Protection (PP) generally addresses the normal day-to-day national operations pertaining to safety and security whereas Disaster Relief (DR) addresses bigger events, such as, natural and made disasters but could also include radiocommunications required at big events (e.g. concerts and sporting events). PP systems are also used at the time of DR operations. The organisational distinction between PP and DR could be different in each SADC country and is a national matter.

As also indicated above, a PPDR framework should include frequency bands for narrowband, wideband and broadband systems.

Narrowband PPDR[9].

Table 1: Narrowband PPDR applications and examples (Reference EEC Catalogue of PPDR Applications Related Applications of June 2012)

Application	*Feature*	*PPDR Example*
1. Narrowband		
Voice	One-to-many	Dispatch and group communication
	Push-to-talk	Push-to-talk
	Person-to-person	Selective calling and addressing
	Security	Voice
	Instantaneous access to voice path	Push-to-talk and selective priority access
Facsimile	Person-to-person	Short message
	One-to-many (broadcasting	Initial dispatch alert (e.g. address, incident status)
Messages	Person-to-person	short message, short e-mail
	One-to-many (broadcasting)	Initial dispatch alert (e.g. address, incident status
Telemetry	Location status	GPS latitude and longitude information
	Sensory data	Vehicle telemetry/status EKG (electrocardiograph) in field
Database	Forms based records query	Accessing vehicle license records
	Forms based incident report	Filing field report

[9](ITU-R Report M.2033): . Narrowband systems are generally national and permanent networks;, for example, digital trunk networks which provide digital voice and low speed data applications (e.g. pre-defined status messages, data transmission or forms and messages, access to databases, etc.) and has typical bandwidths up to 25 kHz

Wideband PPDR[10]:

Table 2: Wideband PPDR applications and examples

Application	*Feature*	*PPDR Example*
2. Wideband		
Messages	E-mail possibly with attachments	Routine e-mail message
Database	Forms and records query	GIS (geographical information systems)
		Accessing medical records
		Lists of identified person/missing person
Text file transfer	Data transfer	Filing report from scene of incident
		Records management system information on offenders
		Downloading legislative information
Image transfer	Download/upload of compressed still images	Biometrics (finger prints)
		ID Picture
		Building layout maps
Telemetry	Location status and sensory data	Vehicle status
Video	Download/upload compressed video	Video clips, identification of individuals and vehicles on location
		Patient monitoring (may require dedicated link)
		Video feed of in-progress incident, patrol cars equipped with video surveillance, Live Video transfer from helicopters
Interactive	Location determination	2-way system
		Interactive location data

[10]Wideband systems carry data rates of several hundred kilobits per second (e.g. in the range 384-500 kbit/s), which allows the transmission of large blocks of data, video and internet protocol-based traffic. Wideband systems compliment narrowband systems and are also national and permanent networks

Broadband PPDR[11]:

Table 3: Broadband PPDR applications and examples

Application	*Feature*	*PPDR Example*
3.Broadband		
Database access	Intranet/Internet access Web browsing	Accessing architectural plans of buildings, location of hazardous materials
		Browsing directory of PPDR organization for phone number
Imagery	High resolution imagery	Downloading Earth exploration-satellite images
Video	Video streaming, live video feed, SDTV, HDTV and UHDTV	Video communications from wireless clip-on cameras used by in building fire rescue
		Image or video to assist remote medical support
		Surveillance of incident scene by fixed or remote controlled robotic devices and Unmanned Aeronautical vehicles (UAVs)
		Assessment of fire/flood scenes from airborne platforms
Robotics control	Remote control of robotic devices	Bomb retrieval robots, imaging/video robots

3.1. PPDR and Other Supporting Functions

Telecommunications, in particular Radiocommunication, have a critical role to play, not only for disaster relief and mitigation but also for supplementary functions, such a, early warning and detection, which could alleviate the impact of natural disasters. These are addressed extensively in various ITU Resolutions, amongst others, ***Resolution 646(Rev. World Radiocommunication Conference (WRC)-19), Resolution 647(Rev.WRC-19), Resolution 34 (Hyderabad, 2010)[12], Resolution 673 (WRC-12)[13]*** and ***Resolution 136 (Dubai, 2018). The Radiocommunication Assembly in 2007 (RA-07)*** also adopted ITU-R ***Resolution 55[14]*** dealing with disaster prediction, detection,

[11]Broadband technology could be seen as a natural evolutionary trend from wideband and allow new capabilities and functionalities to support higher speed data and higher resolution images. It is foreseen that these broadband systems are generally localised to the scene of the incident or accident (also referred to as "hot spot" areas) or at a big event (e.g. concert or sport), where PPDR personnel normally operate. These systems could provide voice, high-speed data, and high quality digital real time video and multimedia applications requiring data rates in the range of 1-100 Mbit/s. PPDR Broadband networks are generally temporary and localised in nature.

[12] Resolution ***34 (Hyderabad, 2010)*** of WTDC-10, on the role of telecommunications/information and communication technology in disaster preparedness, early warning, rescue, mitigation, relief and response

[13] Resolution ***673 (WRC-12)*** of WRC-12 on Radiocommunications use for Earth Observation applications

[14] 12 Resolution ITU-R ***55*** of RA-19, ITU-R studies on disaster prediction, detection, mitigation and relief

mitigation and relief. ***Resolution 55*** addresses the on-going studies within the ITU-R which are meant to develop guidelines related to the management of radiocommunication on the issue of disaster prediction, detection, mitigation and relief. There is also need to take into account of the recommendations found in BR Circular Letters CR/281 (13 March 2008), CR/283 (6 May 2008) and its Corrigendum 1 (13 May 2008), CR/288 (17 July 2008) and CR/291 (9 October 2008)[i].

The use of telecommunications for the safety and security of humanitarian personnel in the field are also addressed in ***Resolution 98 (Minneapolis, 1998)***[15], which urges Member States to ensure that humanitarian personnel have unhindered and uninterrupted use of telecommunication resources required for their safety and security in accordance with the national rules and regulations of the States concerned.

These and other issues should be included in a national and regional disaster management plan.

4.0. FREQUENCY HARMONISATION

World Radiocommunication Conference (WRC) 2000 approved ***Resolution 645 (WRC-2000)***[16] inviting ITU-R to study, amongst others, the possibility of harmonising radio frequency bands globally or regionally for PPDR. The results of these studies and other issues, for example the objectives and applications of PPDR, definitions, user requirements as well as a methodology for calculating the amount of spectrum required for PPDR are contained in ITU-R Report ***M.2033***.

Three main views emanated during these studies. Whereas some administrations believed that global harmonisation of PPDR frequencies is a priority in order to ensure economies of scale for the equipment, another group of administrations believed that PPDR is a national issue and therefore global harmonisation is not a priority. Thirdly, some administrations were of the view that new technologies, including Software Defined Radios (SDR) and International Mobile Telecommunications (IMT) systems should be used to satisfy PPDR requirements. All these three views are correct to some extent.

Global or at least regional harmonisation of frequencies for PPDR will lead to economies of scale, which could benefit in particular developing countries including the SADC region. PPDR, and in particular PP, is definitely a national issue; however, it must be acknowledged that in cases of disasters, international assistance from SADC members and beyond will in many cases be required. Furthermore, disasters

[15] 14 Resolution ***98 (Minneapolis, 1998)*** of the Plenipotentiary Conference, on the use of telecommunications for the safety and security of humanitarian personnel in the field

[16] Resolutions 645 (WRC-2000) was suppressed at WRC-03

may affect a number of nations at the same time therefore international collaboration is essential.

Harmonised frequencies and systems could assist in coordinated agencies, not only for DR but also for PP ensuring that local authorities can communicate effectively with international agencies. Lastly, it is admitted that commercial systems, for example, Global System Mobile (GSM) and IMT are already used extensively in PPDR operations. Where these systems have been deployed, and assuming it has not been affected by the disaster, it can be used very effectively by both national and international agencies.

In many SADC countries, commercial mobile networks (e.g. GSM) are used extensively for PP services, mainly because these are generally available nationally. It is foreseen that these networks will continue to play an important role in the day-to-day PP activities of many countries, even if only in support of the official PP networks.

New technologies such as IMT and Intelligent Transportation Systems (ITS) may be able to support or supplement advanced PPDR applications in the near future for the region.

It is beneficial for SADC to harmonise frequencies to be used for PPDR systems and applications in order to benefit from equipment economies of scale, increased spectrum efficiency, improved cross-border coordination and circulation of equipment and the possibility to have interoperable PPDR systems. It is acknowledged that, currently, different frequency bands and systems are used in SADC countries for PP operations. These are generally in the VHF/UHF frequency bands and are used predominately for voice applications. Different systems and frequencies are also used between the various national agencies with little or no interoperability between systems and networks.

The identification of harmonised frequencies for PPDR systems is a step in the right direction and will lead eventually to the development of SADC regional PPDR systems and procedures. Current systems will however continue to be used although all efforts should be made to migrate to the harmonised PPDR frequencies, using advanced digital technologies, as soon as possible.

It is, furthermore, acknowledged that spectrum requirements for narrowband, wideband and broadband will differ from country to country depending on local conditions, population and number of agencies involved, etc. A minimum amount of bandwidth is, therefore, identified on a regional harmonised basis, which could be supplemented nationally by additional spectrum based on national requirements, if required. It should also be noted that the existing spectrum allocations could be sufficient for day-to-day requirements; additional spectrum may however be required for disaster situations, which could be made available on a temporary basis, as

required, using the identified harmonised frequency bands. It is however important that these frequencies are available immediately for such use.

ITU-R RecommendationM.2015 contains details pertaining to frequency arrangements for PPDR in various Regions and countries adopted in accordance with Resolution ***646 (WRC-19)***. For ATU, the recommended frequency ranges for PPDR are 694-894 MHz and 380-470 MHz. For more details refer to sections 1-1.4.and 2-1.4 of ITU-R Recommendation M.2015.

4.1.1 Narrowband

WRC-03 approved ***Resolution 646 (WRC-19)***[17], which recommends regionally harmonised frequency ranges (no agreement was obtained on global harmonised frequency bands), from which members should adopt frequency bands for PPDR requirements. In Region 1, the frequency range 380-470 MHz was identified as the regional harmonised range for PPDR applications.

SADC Proposed Frequencies for Narrowband:

CRASA Members agreed to adopt the frequency band 380-385 MHz paired with 390-395 MHz as the harmonised frequency band for PPDR narrowband systems in SADC.

4.1.2 Wideband

Since wideband systems will supplement narrowband systems, these must be addressed together. Furthermore, both narrowband and wideband systems are expected to be national systems established on a permanent basis. ITU does not distinguish between narrow, wide and broadband within the band 380–470 MHz. Within Conference of Postal and Telecommunications Administration (CEPT), the tuning range 380-470 MHz, preferably 380 – 430 MHz, has been identified for both narrowband and wideband PPDR applications.[18]

SADC proposed frequencies for Wideband

SADC agreed that the frequency bands 380-470 MHz, preferably 380–430 MHz, has been identified for wideband PPDR applications. Furthermore, those SADC members requiring additional spectrum for wideband PPDR applications, could also use the band 410-420 MHz paired with 420-430 MHz.

[17]WRC-12 amended this resolution (IMT2000 and systems beyond IMT2000 changed to IMT)

[18]***See ECC/DEC/(08)05***. ECC Decision of 8 March, 2019 on the harmonisation of frequency bands for the implementation of digital Public Protection and Disaster Relief (PPDR) radio applications in the bands within the 380-470 MHz range

4.1.3 Broadband

Broadband systems will support narrowband and wideband systems although these systems are not necessarily linked. Broadband PPDR systems are expected to be deployed in hot-spot areas to deal with a particular disaster or event and will therefore generally be of a temporary nature. At global level the ITU has harmonized spectrum that administrations can consider in the frequency range or portions of frequency range 694 -894 MHz to facilitate mobile broadband communications for robust and reliable mission critical emergency services in PPDR, such as police, fire, ambulances and disaster response teams. (Resolution 646 (Rev.WRC-19)).

Within CEPT broadband PPDR is to be deployed in the 700 MHz range within the following paired frequency arrangements;

a) 698 – 703 MHz for Uplink and 753 – 758 MHz for downlink (2x5 MHz)
b) 703 – 733 MHz for Uplink and 758 – 788 MHz for downlink (2x30 MHz IMT)
c) 733 -736 MHz uplink and 788 – 791 MHz downlink (2x3 MHz)

Within CEPT, the below frequency bands could also be considered for additional BB PPDR systems in the 400 MHz range (noting the limited bandwidth available in these bands):

a) 450.5-456.0 MHz (uplink) / 460.5-466.0 MHz (downlink)

b) 452.0-457.5 MHz (uplink) / 462.0-467.5 MHz (downlink)

c) 410.0-415.0 MHz (uplink) / 420.0-425.0 MHz (downlink)

d) 411.0-416.0 MHz (uplink) / 421.0-426.0 MHz (downlink)

e) 412.0-417.0 MHz (uplink) / 422.0-427.0 MHz (downlink)

SADC proposed frequencies for broadband PPDR

In SADC the frequency bands recommended for BB PPDR are;

a) 698 – 703 MHz for Uplink and 753 – 758 MHz for downlink (2x5 MHz).
b) 733 -736 MHz uplink and 788 – 791 MHz downlink (2x3 MHz).

See Annex 1 for more detail pertaining to the 700 MHz frequency arrangements

Additionally, in SADC the frequency bands 410 -420 MHz paired with 420 – 430 MHz could be considered for broadband PPDR.

Further details regarding the implementation of the above bands within CEPT, including sharing and coordination with other services, channel arrangements, etc are contained in *ECC/DEC/(16)02*.

Table 4: Summary of Frequency Bands Adopted for PPDR

Narrowband PPDR	*Wideband PPDR*	*Broadband PPDR*
380-385 MHz paired with 390-395 MHz	380 – 470 MHz preferably 380 – 430 MHz	a) 698 – 703 MHz for Uplink and 753 – 758 MHz for downlink b) 733 -736 MHz uplink and 788 – 791 MHz downlink
	410-420 MHz paired with 420 – 430 MHz	410-420 MHz paired with 420 – 430 MHz

5.0. PPDR STANDARDS

Currently, various technologies are used across the SADC region for delivering PP type services. Some SADC members have deployed digital systems (e.g. the Terrestrial Trunked Radio (TETRA) system). As indicated, one of the advantages of harmonising PPDR frequency bands is the benefits that could be obtained through economies of scale. Also, with the longer term view of having regionally interoperable PPDR systems, it is strongly recommended that common or interoperable PPDR standards be adopted throughout SADC in order to obtain this goal.

Within the frequency bands adopted above, more than one PPDR technology can operate. New technologies for wideband and broadband systems are being developed in many standards organisations, for example, the joined program between European Telecommunications Standards Institute (ETSI) and Telecommunications Industry Association (TIA) known as Mobility for Emergency and Safety Applications (MESA) project.

In Europe, the TETRA system is generally used for the implementation of narrowband PPDR type systems (EN 303 035-1[19] and EN 303 035-2[20]). The TETRA standard for wideband applications, termed TETRA Enhanced Data Services (TEDS), is specified

[19] 20 Terrestrial Trunked Radio (TETRA); Harmonized EN for TETRA equipment covering essential requirements under article 3.2 of the R&TTE Directive; Part 1: Voice plus Data (V+D)
[20] 21 Terrestrial Trunked Radio (TETRA); Harmonized EN for TETRA equipment covering essential requirements under article 3.2 of the R&TTE Directive; Part 2: Direct Mode Operation (DMO)

in ETSI standard EN 302 561[21]. The TEDS standard supports radio channel widths of 25 kHz, 50 kHz, 100 KHz and 150 KHz and allows user bit rates of between 30 and 400 kbit/s, depending on the channel bandwidth chosen and distance to the base station. Asia is also using mostly TETRA.

North America, Australia and New Zealand are using the P25 standard whereas TETRAPOL is used in the national PPDR networks of France, Spain, Switzerland, Mexico, Singapore and a few others. Some countries also use the Digital Mobile Radio (DMR) standard. These standards generally comply with ETSI EN 300 113-2[22].

It is anticipated that LTE technology and its further evolutions will be able to address the needs of broadband PPDR.

6.0. RECOMMENDATIONS

It is recommended that CRASA Members:

a) amend their National Frequency Plans to incorporate the Resolution 647 (Rev.WRC-*19);*

b) work towards achievement of interoperability and harmonisation in the utilisation of the PPDR systems at a regional level, and beyond;

c) adopt common or interoperable standards for providing PPDR networks and services; and

d) notify the ITU of the above adopted PPDR frequencies (Table 4) in accordance with Resolution 647 (Rev.WRC-19 *resolves 2).*

It is recommended to SADC Secretariat to forward the following recommendation to the SADC ICT Ministers:

a) To consider approaching the relevant ministry responsible for Disaster Mitigation and Relief Operations to collaborate on ensuring that SADC Governments ratifies the UN Tampere Convention; and

b) Strengthen regional policy harmonisation process and create a conducive environment for effective coordination and operation of telecommunications and ICTs in disaster situations.

[21] 22 ETSI EN 302561:2016 - Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service: Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

[22] 23 Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

7.0. CONCLUSION

This Framework is in respect of the harmonisation of frequency bands for narrowband, wideband and broadband PPDR applications and associated technical parameters as found in the latest version of ITU-R Recommendation M.2015 according to the Resolution 646 (Rev WRC-19).

CRASA Members are advised to scrutinise their respective regulations in the light of this Framework. CRASA is, therefore, advised to monitor country progress in the implementation of this Framework on a regular basis.

[i]The BR Circular Letters CR/281 (13 March 2008), CR/283 (6 May 2008) and its Corrigendum 1 (13 May 2008), CR/288 (17 July 2008) and CR/291 (9 October 2008), concerning the preparatory steps towards the establishment of a database of available frequencies/frequency bands for use by terrestrial and space services in emergency situations, as well as the data formats for their submission.That, pursuant to BR Circular Letter CR/323 (31 March 2011), the Bureau advised all administrations that only limited information had been received for both terrestrial and space services.Therefore administrators in SADC are encouraged to submit this information.

ANNEX 1: HARMONISED CHANNEL ARRANGEMENTS FOR BROADBAND PPDR IN SADC (698-791 MHz)

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<tr><td>PPDR a) up-link</td><td colspan="6">b) IMT uplink (MFCN)</td><td>PPDR c) up-link</td><td>...</td><td>PPDR a) down-link</td><td colspan="6">b) IMT downlink (MFCN)</td><td>PPDR c) down-link</td></tr>
<tr><td rowspan="2">5 MHz</td><td colspan="6">30 MHz (6 blocks of 5 MHz)</td><td rowspan="2">3 MHz</td><td></td><td rowspan="2">5 MHz</td><td colspan="6">30 MHz (6 blocks of 5 MHz)</td><td rowspan="2">3 MHz</td></tr>
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