Inmarsat comments on the ICASA consultation:
"Draft Frequency Migration Regulation and Frequency Migration Plan"

27 September 2012

1 Introduction

Inmarsat is pleased to respond to the ICASA consultation titled: "Draft Frequency Migration Regulation and Frequency Migration Plan".

Inmarsat operates a network of 10 geostationary satellites providing mobile satellite services to users in South Africa and throughout the world. Inmarsat services are used by ships, aircraft and land vehicles. Transportable and hand portable terminals are also used. The Inmarsat services provided range from low data rate SCADA applications, through voice communications, ISDN and include broadband Internet access. In addition, safety-of-life services are also provided to ships and aircraft.

In several of the bands currently used by Inmarsat, or planned to be used in the near future, ICASA proposes to introduce new terrestrial applications. The proposed applications are not compatible with MSS operations are likely to lead to harmful interference to Inmarsat's customers. These issues are discussed in more detail below.

2 Band specific comments

The sections of concern to Inmarsat are reproduced below, followed by Inmarsat comments.

2.1 Proposals for the band 1518-1525 MHz

ICASA makes the following proposals.

> **4.11.21 1518 – 1525 MHz**
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> The band was allocated for both SF links as well as the IMT satellite component. However, this band remains unoccupied and there are views that the IMT (satellite) will have limited usage within South Africa.
> Due to these factors, ICASA proposes to:
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> Allocate this band for repeater links for land-mobile radio (LMR) and migrate such links into this band. Band could also be allocated for outside-broadcasting links currently operating in 2300 - 2450 MHz.

Inmarsat comments:

The band 1518-1525 MHz was allocated to the MSS (space-to-Earth) by WRC-03. This band will be brought into use in early 2013 by "Alphasat" – Inmarsat's first satellite to use this band and the uplink band 1668-1675 MHz. Alphasat will be located at about 25°E and the coverage area includes

Europe, the Middle East, and Africa, including South Africa. Satellite user terminals capable of operating on these frequencies are already in circulation (operating on the current Inmarsat-4 series of satellites in the bands 1525-1559 MHz and 1626.5-1660.5 MHz). Inmarsat therefore expects to bring the band 1518-1525 MHz into use soon after the launch of Alphasat, with maritime, aeronautical and land terminals (including satellite-IMT terminals) all expected to use frequencies in this range. South Africa is already an important market for Inmarsat, providing important and safety-of-life services to maritime aeronautical users. Inmarsat land mobile satellite services provide voice and data services beyond the reach of terrestrial networks and are particularly popular in the mining industry. The use of the extended L-band frequencies (1518-1525 MHz and 1668-1675 MHz) provides additional capacity to meet demand and to introduce new services in the future.

Although the band 1518-1525 MHz is allocated in the Radio Regulations to the fixed and mobile services, there is a high risk that the use of this band by terrestrial systems will cause interference to receiving MSS user terminals. In the CEPT, this band is designated for mobile satellite use through Decision ECC/DEC/(04)09[1]. There are very few countries around the world which operate terrestrial systems in this band, and many are taking steps to make this band available for new mobile satellite applications. We are not aware of any other country considering the introduction of new terrestrial systems in this band. Many countries which wish to operate fixed links in the L-band spectrum utilise the bands 1 427-1 452 MHz paired with the band 1 492-1 517 MHz, following the channel plan recommended in Recommendation ITU-R F.1242, recommends 3. This avoids overlap with the band 1518-1525 MHz.

Inmarsat therefore respectfully requests that ICASA should modify its proposals, to make the band 1518-1525 MHz available to the MSS and not to introduce terrestrial systems in this band. Proposals for this band should be reviewed together with the band 1668-1675 MHz, discussed below.

2.2 Proposals for the band 1525-1559 MHz

ICASA makes the following proposals.

4.11.22 1525 - 1559 MHz

The band has been identified for IMT (satellite); Res. 225 (WRC applies). In the band 1530 - 1544 MHz priority for maritime mobile distress, urgency and safety communication (GMDSS); Res. 222 applies. The band is currently being used by INMARSAT.

Due to these factors, ICASA proposes to:

- Consider using the 1525 - 1530 MHz band for Fixed links (e.g. repeater links) and migrate such links into this band.
- Band could also be allocated for outside-broadcasting links currently operating in 2300- 2450 MHz.
- Keep the remaining allocation (1535 - 1559 MHz) of the band as-is.

Inmarsat comments:

[1] Available at http://www.erodocdb.dk/doks/doccategoryECC.aspx?doccatid=1

As is acknowledged by ICASA, this band is current used by Inmarsat. We are therefore very concerned about the proposals to introduce new fixed links and outside-broadcasting links into be band 1525-1530 MHz. This band is heavily used by Inmarsat for service downlinks and it is likely that harmful interference will be caused by either fixed links or outside-broadcasting links to MSS user terminals. As MSS user terminals can be used at any locations, there are no means of applying coordination areas or exclusion areas to avoid interference.

The allocation to the fixed service in this band is a legacy from when the MSS allocation was made in the band in 1992. Many administrations which previously operated fixed links in this band have removed them, and most administrations have not deployed terrestrial systems in this band, recognising the likely interference to MSS systems.

Inmarsat therefore respectfully requests that ICASA should modify its proposals, and in particular should not deploy new fixed links or outside-broadcasting links in the band 1525-1530 MHz. We concur that no change should be made in the band 1530-1559 MHz.

2.3 Proposals for the band 1668-1675 MHz

ICASA makes the following proposals.

4.11.23 1668 -1675/ 2483.5 - 2500 MHz

The band has been identified for the satellite component of IMT; Res 225 applies.

However, the use of IMT (Satellite) within South Africa is limited and it is unclear whether this application would ever become significant for broadband with the strong growth of IMT (Terrestrial).

It is therefore proposed by ICASA to:

Change the current allocation to be in line with ITU Region 1 allocations of:

1668 - 1668.4 MHz:

- MOBILE-SATELLITE (earth-to-space)
- RADIASTRONOMY
- SPACE RESEARCH (passive)
- Fixed
- Mobile except aeronautical mobile

1668.4 -1670 MHz:

- METEOROLOGICAL AIDS
- FIXED
- MOBILE except aeronautical mobile
- MOBILE-SATELLITE (earth-to-space)
- RADIASTRONOMY

1670 - 1675 MHz:

- METEOROLOGICAL AIDS
- FIXED
- METEOROLOGICAL SATELLITE (space-to-earth)
- MOBILE
- MOBILE-SATELLITE (earth-to-space)

This change in allocation, in line with ITU region 1 would open up the possibilities of introducing Fixed links (PTP, PMP) into this band.

Inmarsat comments:

The band 1668-1675 MHz is the MSS uplink band normally paired with the downlink band 1518-1525 MHz. As is indicated in the discussion on the band 1518-1525 MHz, Inmarsat will make use of this band after the launch of the Inmarsat "Alphasat" satellite in 2013.

ICASA proposes to introduce fixed systems in this band, which would likely cause harmful interference to the Alphasat satellite. Studies on the potential impact of mobile systems to MSS satellites have been conducted by the ITU-R and are contained in Recommendation ITU-R M.1799. This Recommendation shows that the transportable radio-relay systems should not exceed an e.i.r.p. of −27 dBW in a reference bandwidth of 4 kHz. The same limit is contained in Resolution 744 (Rev.WRC-07) in the Radio Regulations, which also limits the use of this band by the mobile service to transportable radio-relay systems.

While the above mentioned studies relate to systems in the mobile service, the same limits would be required on fixed service systems to protect GSO MSS satellites. It should be clear that there is very limited scope to operate fixed systems in this band and to do so runs the risk of causing harmful interference to MSS systems.

As interference would be received by the satellite receiver, the interference could impact a large number of users and would cause interference to not only to users in South Africa, but also to users operating in other countries or at sea.

It may also be noted that there is no apparent means to prevent interference from MSS user terminals to fixed stations in South Africa. As MSS user terminals may be used at any location, it is not possible to coordinate terminals with fixed link receivers.

Within Europe, the CEPT has developed Decision ECC/DEC/(04)08, which designates the bands 1518-1525 MHz and 1670-1675 MHz for MSS. The band 1668-1670 MHz is not designated to MSS in Europe due to the use of this band by radioastronomy stations. If this band is also used by the radioastronomy service in South Africa, it might be necessary to also limit MSS use in South Africa to the band 1670-1675 MHz.

Inmarsat respectfully requests that ICASA should not proceed with the current proposals, but should carefully review the current and planned use for this band and the band 1518-1525 MHz to allow both bands to be used by the MSS without significant risk of interference both nationally and internationally. Inmarsat would be pleased to discuss the detailed arrangements with ICASA.

2.4 Proposals for the band 1980-2010 MHz and 2170-2200 MHz

ICASA makes the following proposals.

4.11.25 1980-2010/ 2170-2200 MHz

The band has been identified for the satellite component of IMT; Res 225 applies.

However, the use of IMT (Satellite) within South Africa is limited and it is unclear whether this application would ever become significant for broadband with the strong growth of IMT (Terrestrial). The band is also allocated for Fixed Links, but currently lies unused in the lower band and utilized by SANDF, Transnet amongst other users in the upper band; this is however under-utilized. It is therefore proposed to:

- Allocate for Fixed links and migrate in Fixed links (DF) from other bands.
- Allocate for BFWA depending upon availability of equipment in these bands (New ICASA proposal).

Inmarsat comments:

These bands are allocated to the MSS and are planned to be used by the MSS in Europe. Inmarsat is one of the two operators to have been selected for provision of service in Europe. MSS systems serving South Africa might also be introduced in the near future. ICASA proposes to introduce fixed or BFWA systems in these bands, but such systems are generally not compatible with MSS operations. While these bands are allocated to the fixed and mobile services in the Radio Regulations, Resolution 716 (Rev.WRC-2000) urges administrations to transition fixed service systems *out* of these frequency bands.

Inmarsat is concerned that the planned introduction of fixed or wireless access systems will effectively prevent these bands from being used for MSS systems not only inside but also outside of South Africa.

Inmarsat requests that the bands 1980-2010 MHz and 2170-2200 MHz should not be used by terrestrial systems so that the bands may be used by international MSS systems in the future.

2.5 Proposals for the bands 3400-3600 MHz and 3600-4200 MHz

ICASA makes the following proposals.

4.11.30 3400 - 3600 MHz

This band is currently being utilized by:

- Sentech (national).
- Neotel (national).
- Telkom (national).
- USAL (regional).

In terms of WRC 07 decisions and as per SADC FAP proposed common sub-allocation/ utilization it is proposed to:

- Allocate for mobile service on a primary basis and use for Mobile IMT. This would also result in a harmonized Mobile IMT band across the entire SADC region.
- Migrate existing users out of the band.

4.11.31 3600 - 4200 MHz

This band (C-band) is currently being utilized for PTP links (terrestrial backhaul) and Satellite links including VSAT, Satellite downlink and tracking. The proposed allocation as per SADC proposed common sub-allocation/ utilization is:

- (3600-4200 MHz) Fixed services (PTP).
- (3600-4200 MHz) Fixed-satellite (space-to-Earth) (PTP/VSAT/SNG).
- (3600-3800 MHz) Broadband Fixed Wireless Access (BFWA).

The sub-band 3600-3800 MHz could be used for BFWA where frequency sharing with FS PTP and/or FSS is feasible. The channelling arrangement for PTP links in this band is based on ITU-R Recommendation F.635. The sub-band 3600-4200 is used for medium and high capacity PTP links and FSS. In the band 3600-3800 MHz, BFWA, FS PTP and FSS applications will have to operate on coordinated basis. However, considering the

difficulty in coordinating ubiquitous user terminals used for BFWA and VSAT, it is proposed that:

- VSAT systems should be migrated to the Ku-band (ref: 4.11.36).

Inmarsat comments:

Our comments here relate to both the bands 3400-3600 MHz and 3600-4200 MHz. Inmarsat's land earth stations, used for the feederlinks of our MSS network, operate in parts of both these bands. Inmarsat's land earth stations are located throughout the world, but we do not have an earth station located in South Africa. Nonetheless, we are concerned that this proposal, in particular with respect to the intention to migrate satellite users from these two bands. As BFWA is the "newcomer" to this band, it should be up to that service to co-exist with the current FSS users. Part of this band, the band 3400-3800 MHz has been identified for BWA (fixed and mobile) in Europe. However the approach taken in Europe is that new BWA systems are required to protect existing earth stations. We do not consider it warranted or practical for earth station users to migrate from this band to Ku-band.

Inmarsat proposes that ICASA review its proposals, to ensure that these bands can continue to be used for existing and future FSS earth stations.

3. Concluding comments

Inmarsat is very concerned with the proposals identified above. There is an apparent desire to make more spectrum available for terrestrial fixed applications at the expense of satellite applications. This apparent strategy does not seem to be well justified, in particular the benefits of fixed satellite and mobile satellite applications to South Africa do not appear to have been considered. We are not aware of a similar strategy being pursued by any other country. Furthermore, the effect of the current proposals on the use of satellite applications operating in South Africa and in neighbouring countries and international waters and airspace must be assessed and taken into account. Both satellite and terrestrial services have an important role in providing communication services to South Africa and are better balanced strategy should be considered.

We request that ICASA gives full careful consideration to our specific comments and proposals above. We thank ICASA for the opportunity to comment and we would be pleased to provide further information if requested. Requests for further information may be sent to:

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