Denel SOC Ltd, t/a Denel Overberg Test Range

ICASA NOTICE 782 REGARDING THE DRAFT RADIO FREQUENCY SPECTRUM ASSIGNMENT PLAN FOR THE FREQUENCY BAND 2025 TO 2110 MHZ PAIRED WITH 2200 TO 2285 MHZ FOR CONSULTATION

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1. Introduction

Denel SOC Ltd, trading as DENEL OVERBERG TEST RANGE (Test Range), is located in the Overberg Region of the Western Cape, South Africa. Denel SOC Ltd operates primarily in the military and landwards defence environment. The South African government is its sole Shareholder, and as a state owned company, it reports to the Minister of Public Enterprises.

The Test Range operates as a multi-purpose missile and aircraft test range that provides in-flight systems performance measurement and weapon system evaluation services to local and international clients. The Test Range prides itself on being able to provide a turnkey service to its clients throughout the year. In this way it not only plays a significant role in enabling the responsible testing of defence equipment, but also contributes to South Africa's foreign exchange earnings.

The Range is located in the **proclamated flight area, FAR147**, controlled by the South African Air Force. The AFB Overberg with its 3000m main and 2000m secondary runways is located adjacent to the Test Range.

The Test Range has **two primary telemetry facilities** installed at fixed locations available to provide real-time reception, recording and relay of telemetry data. These systems are ideally located to support operations at sea as well as air. In addition, three mobile secondary telemetry facilities are available for integration purposes or telemetry reception at remote sites.

The telemetry units are equipped with telemetry work stations, various displays, communication video links and have interfaces to integrate range user specific equipment with the telemetry systems of the station.

Each of the fixed systems is equipped with 2.5m and 4.5m parabolic tracking antennas and features:

a) **S-band reception (2200 to 2400 MHz) with dynamic range of approximately 90dB**
b) **Antenna gain of 37.5dBi**
c) Two-axis auto tracking on both antennas
d) Diversity-reception and pre and post-detection combined.
e) Simultaneous handling of multiple telemetry channels
f) FM PCM, IRIG format
g) High data rates
h) Real-time data manipulation and display capability
i) Reception of 3 video channels simultaneously
j) Real-time display for safety and system evaluation

Two fixed and three mobile telemetry stations are available for real-time reception, recording and relay of on-board telemetry data at a frequency band of 2200 to 2400 MHz Stations are equipped with two-axis auto tracking S-Band antennas.

The Test Range has been established by the South African government in the 1980's as a strategic service provider to test in-flight systems by the Department of Defence (DoD). The DoD has ever

since contracted the Test Range to provide government services on an on-going basis. The DoD has this year issued a five-year contract to the company for such services. The DoD has informed us that it is also the legal title holder of the frequency band between 2200 MHz to 2400 MHz under license number **253-629-9**.

Telemetry data from devices being tested is used primarily by the Test Range for safety purposes where the position and status of objects are monitored. Safety footprints are defined and analysed and it is paramount for tests to be contained in these areas especially with population growth in the area and increased activities in the vicinity of the Test Range. Any interference with these safety parameters could possibly lead to the destruction of a normal projectile or cause the erroneous impact of such with negative repercussions.
Refer to the National Integrated ICT policy white paper of 2016, paragraph 9, for ideologies regarding the management of this strategic resource.

2. Comments on ICASA's Notice

We as Denel Overberg Test Range are **opposed** to the draft radio frequency spectrum assignment plan for the frequency band 2025 to 2110 MHz paired with 2200 to 2285 MHz specifically in the FAR147 region as any sharing in this geographical area causing interference will null and void the strategic operations of the DoD at the Test Range and Airforce Base Overberg (AFB OVB).

The only area of concern to us is that which has been **proclamated flight area, FAR147**. The area includes Bredasdorp, Napier, Riversonderend, Swellendam, Stil Bay, Witsand, Struis Bay and Cape Agulhas. All these towns are in the Overberg region of the Western-Cape.

The frequency spectrum band under consideration is not under-utilized. The main reason for the allocation of this frequency band to the DoD is their requirement to test its systems relating to government services in this proclamated flight area. It is of utmost importance that the Test Range has the entire band from 2200MHz to 2400MHz available exclusively. The very wide bandwidth occupied by the modern weapon systems dictates that. The proposed assignment of this band to fixed mobile systems will cause severe interference in the area to the extent that general public safety might be compromised. It will also interfere with telemetry equipment at the Test Range and thus the contractual obligation to the DoD.

Interference mitigation
Although the band is signified to be used only for P2P links, the nature of operations between South African Airforce (SAAF) at AFB OVB and the Test Range where low flying objects are common, the risk of interference still exists to a great degree and should be taken into account.
The telemetry systems utilised have extremely sensitive receiver front-ends and the limiting of radiated power would not be a viable mitigating factor to prevent external interference.
The only solution in the FAR147 region would be "geographical isolation" as receivers are not band limited to channels inside the 2200 MHz to 2400 MHz spectrum. Refer to ITU R SA.1154 for a description of certain aeronautical mobile telemetry systems operating in the 2200-2290 MHz band.

Comments on Notice 782: RFSAP – Rules for Services operating in the Frequency Band 2025 to 2110 MHz paired with 2200 to 2285 MHz:

Any use of this band in the area FAR147 should be prohibited. Proposed Broadband Fixed Wireless Access has the same implications as addressed under Notice 783 and thus should be regulated by the Authority under the same principles.
Base Station Antenna elements signified for Land Mobile and used in Fixed Wireless Access systems covers between 60° and 120° areas and will interfere with Telemetry irrespective of proposed mitigating factors.
This band is not currently "unused" as stated in the Notice as it is part of the spectrum utilized in geographical area FAR 147.

3. Conclusion

Denel Overberg Test Range is available to make a presentation to the committee and invite committee representatives to visit the Test Range in order to ascertain the facts for themselves.

We thank you for the opportunity to make written comments on notice 782 of 2017.

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