DRAFT FIVE YEAR SPECTRUM OUTLOOK 2022–2026 RADIO SPECTRUM MANAGEMENT New Zealand,

Invitation to comment.

Setting direction for radio spectrum management DECEMBER 2021
(Info: Original text from RSM in Blue)

Draft Response: Riedel Communications.:
In our response, we will comment on each of the sections and conclude by addressing each of the above questions. .

24.2.2022

1. Introduction

Riedel Communications, founded in 1987, designs, manufactures, and distributes innovative mission critical real-time networks for video, audio, and communications. Its products are used for broadcast, pro-audio, event, sports, theatre, and security applications worldwide. The company is known for pioneering digital audio matrix systems, as well as SDI and IP-based media networks. Riedel is headquartered in Wuppertal, Germany and employs over 700 people in 20 locations throughout Europe, Australia, New Zealand, Asia, and the Americas.

Radio Spectrum Management (RSM) has posed 3 questions on spectrum management in New Zealand for the next 5 years:

1. Have we identified the range of technological advancements and probable new demands relevant to New Zealand?
2. Have we prioritised the right issues that we will need to actively manage through our work programme (to the extent this is possible to predict now)?
3. Are there other matters that we should cover?

RSM Document structure:
Section 1 - provides a summary of the legal and operational framework
Section 2 – Looking forward - technologies driving change
Section 3 – Looking forward - trends in spectrum management
Section 4 - Our priorities.

Section 1:

RSM text: In general, regulating radio spectrum:

- Supports public policy objectives, including providing for Te Reo Māori and public broadcasting
- Supports economic growth by enabling information and communications technology innovation, and competitive broadcasting and communications sectors
- Meets the growing demand for wireless services
- Facilitates non-commercial spectrum uses that benefit New Zealand, including public safety and defence communications, short-range devices (such as Wi-Fi) and industrial, scientific and medicinal applications.

Section 1: Riedel Comment

As a large user of radio frequencies both globally and in New Zealand, Riedel Communications believes that RSM are doing a very good job of preparing an environment for technological wireless innovation across many industries, but also making sure that the public interest is upheld and served by access to services delivering high quality programming on national TV or on other streaming sources. We welcome the opportunity to respond to this consultation and hope that we can provide valuable insights to ensure that the spectrum landscape remains healthy and addresses the needs of the whole of New Zealand.

Riedel Communications has a long history of delivering Intercom solutions for broadcast quality audio and video in Program Making and Special Events (PMSE). Many of these events are etched on the public's conscious and belong to what can be described as "In the Public Interest". Examples include the recent Winter Olympics in Beijing, The Summer Olympics in Tokyo, the Football World Cup, Formula One, the Americas Cup and Sail GP to name but a few.

Annex 1, at the end of this response includes a list of Riedel installations in New Zealand for PMSE, Industrial, Healthcare and Houses of Worship that rely on the fair allocation of spectrum for broadcast audio and video production, intercom systems supporting security and blue light services as well connecting teams of surgeons in hospitals.

Riedel Communications value the efforts taken by RSM to make spectrum available for events in the public interest and the attention to detail in assigning spectrum and keeping it interference free for example in the Americas Cup. To support these events successfully and to live up to the growing appetite for more immersive coverage of events (e.g., Americas Cup,), we are challenged by the limits imposed by a finite quantity of radio spectrum being used by other manufacturers, organisers and teams.

The 36th Americas Cup for example was supported by a range of Riedel's wireless products (see Info) for team communications, camera solutions, audio technologies, and sensor technology embedded in a comprehensive technical infrastructure. This is supported by an on-site team of 30 members managing all audio, video, communications, tracking, and data transmission systems, including signals from on-board cameras, chase boats, and helicopters. Since all camera, microphone, and transmission systems must withstand extreme marine conditions, license exempt radio spectrum and a flexible access to it is a key ingredient in delivering a quality product. RSM's appreciation of this helps Riedel to continue to offer quality programming.

Capacity:

Offering good quality though, exerts demands on capacity. Motor sport for example demands the highest number of radio channels of any single event. At an average Grand Prix, almost every team,

staff, mechanics, management, and security are all connected to their own Riedel Intercom system. For audio connectivity, a total of 1600 2-way radios are in use at any one time with teams and organisers equipped with up to 150 bi-directional DECT intercom Belt-packs at a time. Hence, we cannot impress enough upon RSM the importance of the DECT band for our business and its contribution to quality programming. The congoing discussion around additional spectrum from 1900-1920MHz as is currently considered in ACMA's public consultation on the future use of the DECT Frequencies is an important development that could help relieve the situation.

In addition, our video intercom equipment is processing huge quantities of HD quality video for broadcasters. In both cases, Riedel is pushing the technological boundaries to deliver quality, robust connectivity for all participants. The entire industry is heavily dependent on well-structured and managed radio spectrum. With DECT, the technology cleverly takes care of frequency planning of the air interface, assigning free channels when and where necessary. For video broadcasting in the 2-3 GHz PMSE bands, we are only one of many large users of frequencies, and experience capacity issues and a higher noise floor due to the busy nature of those bands. For video we would welcome a flexible and straightforward approach to allocating of spectrum for wireless video applications (e.g., Cameras) in higher frequency bands that are currently not designated for this purpose but used on special occasions (e.g. 6.8-7.5GHz bands) and beyond into the 10GHz band.

Section 2:
Looking Forward - Technologies Driving Change.
We wish to understand the technology trends driving change in New Zealand and their potential to support digital transformation, while achieving spectrum resource and regulatory objectives.

Section 2: Riedel Comment:

Like RSM, we believe that 5G will fundamentally change the way we think about mobile communications. Over time it will touch almost all aspects of our lives. We also believe that private networks will play an important role in rolling out new services to industry, culture, schools, educational institutions, and PMSE in equal measure. In a similar vein, we think that mobile services and the spectrum dedicated to them will grow exponentially but would caution against removing spectrum from industry's that produce the content offered as one of these mobile services.
5G is multi-faceted and will be successful with a wide range of different wireless solutions that work seamlessly with each other in a "network of networks" For this reason is it critical that wireless technologies are cognitive, performing wireless interference avoidance and channel assignment tasks automatically. This underpins the RSM strategy of ensuring that spectrum can be shared across many different applications. In the case of the DECT technology, this is already the case with industrial, residential, enterprise and PMSE applications all sharing the same 20Mhz of bandwidth using a polite channel assignment mechanism.

DECT-2020
With the introduction of the new ITU-R standard IMT-2020, the DECT industry has added a new 5G version of its standard called DECT-2020 that fulfils the IMT-2020 specification in Massive Machine Type Communications and Ultra Reliable Low Latency Communications (URLLC). This technology uses the traits that have made DECT so successful to address areas of industry and low latency communications opening many new avenues of opportunity for 5G and economies like New Zealand in particular.

Not only does DECT-2020 address a range of new industrial use cases with its mesh network capability, but it also ensures that all existing legacy DECT applications can co-exist harmoniously with DECT-2020 using listen-before-talk capabilities. This cognitive radio ensures that the frequency band is automatically planned and makes optimal use of the radio spectrum.

Reducing RSM efforts with interference management:
5G is good for industry and culture and RSM are wise to support new possibilities for private 5G networks in designated 5G bands e.g., in 3.3-3.4 GHz and 3.8-4.2 GHz bands. In such cases it is very beneficial if the technology automatically assigns channels and performs interference avoidance reducing the necessity for the regulator to intervene. For new 5G technologies, dedicated to enabling large M2M networks, this is a key requirement. DECT-2020 has been designed to do just that and make optimum use of spectrum resources. To this end, additional spectrum in the 1900-1920Mhz band would be hugely beneficial and relieve many capacity problems being experienced due to its own success in enabling high quality audio applications. As mentioned above the ACMA is currently working on a public consultation dealing with the future of DECT spectrum in Australia.

Section 3: - Trends in Spectrum Management

Section 3: Riedel Comment

Spectrum sharing:
The DECT industry has done extensive research on potential sharing schemes and concludes that the use of a similar channel access scheme makes sharing possible and attainable. Co-existence in the co-channel with technologies that do not share the same channel access scheme leads to spectral inefficiency and to a potential waste of precious spectrum. For instance, legacy DECT contains DECT, DECT-NG (CAT-iq), ULE and DECT Evolution. These all share the same channel access scheme as DECT-2020 making an ideal spectrum sharing environment.

Use of higher frequencies
Consider updates to General User Licences, particularly for short-range devices and monitor developments in the use of 6 GHz for Wi-Fi 6E

Short Range Devices:
Like RSM, Riedel also believes that licensing approaches that enable spectrum sharing such as for Short Range Devices are to be welcomed. Riedel Communications is currently evaluating the use of the 5725-5875MHz band for SRDs as per ERC Recommendation 70 03 Annex 2. “Wireless Industrial Applications for Worker Communications” perfectly describes the application that we see in a whole range of use cases with Riedel Equipment. The Riedel Bolero product for example is a DECT system that enables worker communications on factory floors, power plants, hospitals, events and in emergency blue light services. Given the capacity limitations experienced in many heavy use scenarios, we believe that such an SRD band would be highly beneficial for solving capacity issues. The 5,8GHz band is also globally available subject to different regional requirements. For example, in Europe, such SRDs can function with 400mW transmit power and in the ISM band with 1 Watt in ITU-R regions 2 and 3.

We also welcome the proposed use of the 6GHz bands for ISM(Wi-Fi) and as a potential band for high quality wireless cameras in broadcasting scenarios. Currently the band above 6,8GHz is not assigned to video PMSE, but given the high usage of the 2GHz band, the 7GHz band offers a relatively noise free

opportunity for high quality video for sports and cultural events in the public interest. We would welcome feedback from RSM as to a potential usage for video PMSE.

In response to the 3 dedicated questions:

1. Have we identified the range of technological advancements and probable new demands relevant to New Zealand?

   Riedel Response:

   We believe that RSM has correctly identified the technological advancements and the demands that they will bring.
   We would however like to point out that 5G is a large topic that requires many different solutions to work with each other to succeed. Each of those cogs need to be considered and a spectrum policy enacted that ensures an efficient and diverse use of spectrum. We also think that mobile services and the spectrum dedicated to them will grow exponentially but would caution against removing spectrum from industry's that produce the content offered as one of these mobile services.

2. Have we prioritised the right issues that we will need to actively manage through our work programme (to the extent this is possible to predict now)?

   Riedel Response:

   We believe that by prioritising the efficient use of spectrum, RSM has acted correctly. We also agree that providing sufficient license free spectrum for events in the public interest is correct and serves the needs of the whole population. Spectrum for mobile services is good for the public, but content creation also requires adequate spectrum, so that there is content to stream.

3. Are there other matters that we should cover?

   Riedel Response:

   As mentioned above, we strongly believe in the DECT technology for much of our business, as it offers many advantages that other wireless technologies cannot. We would like to request that it remains in place and if possible be extended to include the 1900-1920Mhz band.
   Using the 7GHz band for Video: A flexible use of 7GHz spectrum for content creation in the public interest is very welcome and Riedel Communications would be happy to provide further perspectives on this. In addition, Riedel see potential benefits in the 10GHz band region and request this band is also considered for availability in New Zealand for future applications.

   Riedel Communications would like to thank RSM for the opportunity of contributing to this consultation and are open to any further discussion on the subject.

Annex 1: A (non-exhaustive) list of Riedel Installations in NZ

NZICC
Aotea Centre
The Edge
Auckland Theatre Company
Derek Slade (Derek Slade - IMDb)
Tab (former New Zealand Racing Board)
Norwest Group (Spyglass)
Arise Church
Protel International Technologies
Americas Cup
Sail GP