



Australian Government
Defence

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FIVE-YEAR SPECTRUM OUTLOOK 2023-28 AND 2023-24 WORK PROGRAM

References

- A. Five-year spectrum outlook 2023-28 and 2023-24 work program – Draft for consultation
- B. NATIONAL DEFENCE – Defence Strategic Review
- C. 2022 Defence Information and Communications Technology Strategy
- D. Australian procedures for the coordination and notification of satellite systems

1. Defence appreciates the opportunity to comment on the Five-year spectrum outlook 2023-28 and 2023-24 work program – draft for consultation provided in Reference A. Defence also notes that there will be opportunities to engage with the ACMA on an issue-by-issue basis as the work program takes its course.

2. The Australian Government has recently conducted the Defence Strategic Review (The Review – Ref B). The Review sets the agenda for ambitious, but necessary, reform to Defence's posture and structure. It calls for genuine whole-of-government coordination of Defence policy and activities with wider efforts in statecraft. Its implementation will require significant whole-of- government and whole-of-nation efforts and commitments. Defence would like to use this opportunity to invite the ACMA to join this whole-of-government initiative for National Defence in achieving the challenging tasks required for all Australians.

3. Amongst other things, the Review points out the central role that our Alliance with the United States plays to Australia's security and strategy. In the coming decades, the expectation is to further deepen this cooperation at all levels including scientific, technological and industrial. Defence would advise the ACMA to consider this recommendation when decisions are made with respect to potential spectrum management framework harmonisation.

4. Defence would like to acknowledge the ACMA's effort on the work that has been done via the Asia Pacific Telecommunity (APT) in conjunction with the Department of Infrastructure, Transport, Regional Development, Communications and the Arts. The upcoming 6th Meeting of the APT Conference Preparatory Group for WRC-23 scheduled for Aug 2023 in Brisbane is a great example and recognition of these efforts. Through the Review, it has been recognised that the partnership with the Indo-Pacific region remains essential, and that Australia's focus must be to deepen its engagement and collaboration with partners across Southeast Asia and the Pacific.

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5. The Review has emphasised the importance of having fully integrated capabilities across five domains: Navy, Army, Air Force, cyber and space. As the electromagnetic spectrum plays one of the key roles for connection and integration across all five domains, Defence would like to kindly request the ACMA's assistance in facilitating this integration within its own power and responsibilities.

6. Finally, the Review has listed the critical capabilities enabling the Integrated Force to deliver successful operations. It includes undersea warfare capabilities, enhanced integrated targeting capabilities, a developed network of northern bases and etc. Although, the expectation is to get the full details of the capabilities in Q2 2024 once the National Defence Strategy is published, it is clear that these critical capabilities cannot be delivered successfully without accessing the electro-magnetic spectrum. At this stage, Defence estimates that an increase spectrum demand will be required for telemetry and telecommand services, across almost all frequency bands designated for radiodetermination services, wireless broadband access as well as satellite communications.

7. Defence would like to acknowledge the excellent relationships established between the ACMA and Defence at all levels and desires that this cooperation continues to deepen in order to achieve those critical and challenging tasks that the Australian Government has set as whole-of-government efforts. It is critical to recognise that the imperative for enhanced Defence capability will mean that Defence's assured access and utilisation of spectrum will only increase in the future.

8. Annex A provides feedback on market and technology drivers of change in spectrum use. Annex B provides feedback on the 2023-24 annual work program plan and in particular on Defence's position on selecting various frequency bands for future mobile telecommunications systems.

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9. My point of contact is Dr Snezana Krusevac on [REDACTED] or via email [REDACTED].

Yours sincerely

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ANNEXES:

- A. Feedback on Market and Technology Drivers of Change in Spectrum Demand
- B. Feedback on 2023-24 annual work plan

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FEEDBACK ON MARKET AND TECHNOLOGY DRIVERS OF CHANGE IN SPECTRUM DEMAND

1. Defence understands the ever-increasing demand for wireless connectivity by the wide range of consumers of this product including the general public, businesses and government. In line with these trends Defence will also invest in next generation wireless networks and sovereign satellite capabilities ensuring that Defence remains connected to securely communicate, collaborate and co-ordinate where and when it is required, including in the deployed, degraded and disconnected environment.
2. It is worth noting that Defence has military specific spectrum requirements that serve all Australians for the purposes of defending Australia and its national interests in order to advance its security and prosperity. The spectrum demand for these military specific applications is increasing significantly and will require both greater efficiency of use and where necessary access to additional spectrum for Defence purposes.
3. Defence would appreciate the ACMA's full cooperation to meet these diverse spectrum demands enabling operation in a truly heterogeneous spectral environment, and deliver the capabilities set in the Review.

WIRELESS BROADBAND

4. In the 2022 Defence Information Communication and Technology Strategy (Ref C), Defence sets a strong commitment for a connected and digital Defence capable to communicate and collaborate through mission capable information and communications technology, when and where it is needed. Defence is investing in next generation wireless networks and sovereign satellite capabilities ensuring that Defence remains connected to securely communicate, collaborate and co-ordinate where and when it is required, including in the deployed, degraded and disconnected environment.
5. Defence supports ACMA's efforts for preliminary replanning of the 1.9 GHz bands enabling operation of various WBB applications. Defence also provides support for replanning the 1.5 GHz band as per our response in 2022.

TERAHERTZ BANDS

6. Defence welcomes the ACMA's interests in the terahertz frequency range (100 GHz to 420 THz). It is worth investigating regulatory arrangements similar to the US FCC and the UK Ofcom's arrangements in the bands above 100 GHz. As pointed out in the overseas regulatory arrangements, the intention is to support future developments of these technologies which are mostly used for short range devices, land mobile and fixed point-to-point links. DSO is not aware of any firm plans for currently utilising THz technologies but this situation may change in the future.
7. Defence would like to point out the rapid developments of optical communication technologies in recent years. In order to support 5G and beyond features such as high bandwidth, low delays and high precision synchronisation, many optical communication network architectures are being developed. Defence runs several projects experimenting with

free space point-to-point optical links as part of terrestrial networks. There are also some hybrid Earth-to-space links consisting of RF and free space optical links. The links operate in accordance with the Australian/New Zealand Standard for Safety of Laser Products AS/NZS IEC 60825. 1:2014 and the Defence Radiation Safety Manual. Defence can provide greater detail as required.

8. Defence understands that frequency bands up to 420 THz are considered to be radio waves as per the definition provided in the *Australian Radiofrequency Spectrum Plan 2021*. Defence also acknowledges that the frequency bands above 275 GHz are currently not allocated. Defence recommends further examination of the arrangements to access this spectrum in order to protect the currently operating free space optical links.

SATELLITE COMMUNICATIONS

9. Defence recognises an increased investment in LEO satellites and mergers involving LEO operators and incumbent satellite communications operators worldwide. It is notable that partnerships and mergers between LEO and geostationary orbit (GSO) operators, telecommunications companies and device manufacturers, and satellite services direct to mobile handsets are on the rise.

10. However, Defence would like to acknowledge there are no Australian mega-NGSO operators. On the contrary, Australia is home to small-medium industry that operates small constellations. This includes several DSTG programs funded by the Government and industry partnerships. The Australian spectrum management framework should be set to accommodate these smaller players. Also, the protection of GSO from mega-constellations, in particular on frequency ranges that Art 22 does not apply, now becomes a challenge. It is expected that Australia's spectrum management framework is ready to manage expectations of both NGSO and GSO operators.

11. Defence supports the initiative to review the satellite filing procedures (Ref D). Defence notes that the 2012 version requires simplification with the intention of expediting the process which will allow Australian operators to be more competitive internationally in accessing orbital resources.

12. Defence appreciates the current practice of consulting potentially affected Australian operators prior to proceeding with the submission of ITU satellite filings. For example, Defence would recommend adding appropriate timelines for the acknowledgment of any concerns which are either declared critical or could be dealt with routinely in due course. Defence trusts that this will facilitate the process.

13. Defence supports the ACMA's initiative from the Response to Submissions Draft FYSO 2022-27, September 2022 to consider providing band planning to support FSS in the 37-52 GHz frequency band. There is already approximately 1000 filings in this frequency band thereby indicating a growing interest in using this frequency band for satellite services. Defence is also aware that there is also interest for use of this frequency band by other services.

FEEDBACK ON THE 2023-24 ANNUAL WORK PLAN

1. Defence understands that the Australian market is heavily influenced by international trends seeking the fast adoption of new emerging technologies predominantly led by mobile wireless telecommunication entities. Defence however trusts that the ACMA will support Defence to deliver the challenging goals set in the Review as a part of whole-of-government commitments and efforts to achieve the new strategic conceptual approach of National Defence.

2. Defence continues to raise concerns on the following topics listed in 2023-24 annual work plan:

MONITORING STAGE

3. **3 300–3 400 MHz: Defence is concerned about monitoring this frequency band for possible allocation for IMT.** This reallocation will impact a growing number of Defence radar capabilities including non-itinerant systems. Defence would like to point out the results of Study F of ITU-R Report M.2481 that clearly indicate that possible implementation of mitigation measures, applicable to Australian scenarios, could only make IMT deployment overly restrictive without further denying spectrum to key Defence radar capabilities that will be in service for several decades.

4. In the latest Electronic Communications Committee (ECC) overview on the spectrum for wireless broadband from May 2023¹, the ECC reported that the 3.4-3.8 GHz has been already harmonised within Europe. It is clearly evident that 3.3-3.4 GHz band has not been identified under roadmaps for 5G and beyond in Europe.

5. Whilst the United States Federal Communications Commission Rule from Dec 2022² has predominantly focused on the 3450-3550 MHz frequency band, the 3.3-3.45 GHz band is still pending the outcome of future planning involving identification of complex sharing opportunities.

6. It is also of vital interest to take into account Australia's long term investment into developing globally unique Defence assets before repurposing the 3300-3400 MHz frequency band.

7. **4 400–4 990 MHz: Defence is concerned about monitoring this frequency band for possible allocation for IMT.** This frequency band supports multiple Defence applications across the land, sea and air domains. Over the years, Defence has continuously objected to monitoring the 4.4-4.5 GHz and 4.8-4.99 GHz frequency bands in all responses to the previous FYSOs. On these continuous objections, in 2022 the ACMA responded by including an additional 300 MHz (4.5-4.8 GHz) of Defence bands under the monitoring stage without acknowledging Defence's objections or consulting Defence.

8. This frequency band is part of the harmonised Five Eyes and NATO spectrum used by aeronautical mobile services (AMS), fixed line-of-sight and non-line-of-sight for data,

¹ [CEPT.ORG - ECC - Topics - Major topics - Spectrum for wireless broadband – 5G](https://www.cept.org/News/2023/05/23/CEPT-ORG-ECC-Topics-Major-topics-Spectrum-for-wireless-broadband-5G)

² [Federal Register :: Facilitating Shared Use in the 3100-3550 MHz Band](https://www.federalregister.gov/d/2022-12-28/2022-12-28-federal-register-notice-facilitating-shared-use-in-the-3100-3550-mhz-band)

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command, control and telemetry as well as for Navy fleet wide communications including mesh networks all of which are currently used by Defence in Australian territory today through either legacy systems or newly acquired systems across major Defence capability projects. AMS use also extends to command and control of weaponised systems. Due to the very complex spectrum environment including weaponised systems, either sharing or replacement of equipment will simply not be possible. It is worth noting that these bands are the few remaining frequency segments below 6 GHz available to Defence and it is vital to preserve these bands for defence purposes.

PRELIMINARY REPLANNING

9. **1.5 GHz (1427-1518 MHz):** Defence has provided the response to the 1.5 GHz band. There is a growing demand for AMS access in this band directly by Defence as well as for defence industry for testing systems with larger spectrum bandwidth requirements as is confirmed in the Review. Defence welcomes the initiative to release a discussion paper that could provide some certainty for spectrum access. Defence is still concerned about potential implications on the AMS from future LTE and MSS systems if these services are going to be considered under the future scope.

IMPLEMENTATION

10. **2 GHz (1980-2010 MHz and 2170-2200 MHz):** Defence is not directly affected by replanning options in the 1 980–2 010 MHz and 2 170–2 200 MHz frequency bands. However, Defence heavily uses the adjacent band 2 200–2 290 MHz for AMS and uses this band for satellite operations. Defence is concerned of any collateral effects of spectrum replanning.