



Australian Government
Bureau of Meteorology

GPO Box 1289
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5 December 2014

The Project Manager
Spectrum Review
Department of Communications
GPO Box 2154
CANBERRA ACT 2601

By email: spectrumreview@communications.gov.au

Dear Sir/Madam,

**Comments on the Spectrum Review Potential Reform Directions Consultation Paper
November 2014**

Please find attached a submission from the Bureau of Meteorology containing its response to the proposals put forward in the above paper. The Bureau appreciates the opportunity to present its views as part of the public consultation process, and looks forward to making more detailed contributions in subsequent stages of the Spectrum Review.

Access to necessary and interference-free radiofrequency spectrum is crucial to the Bureau fulfilling its obligation to provide an effective and efficient meteorological service to the Australian public and to both public and private organisations. A partial or total loss of access to this spectrum, either through interference from other services or through spectrum being re-allocated and sold to commercial users via market-based mechanisms, would have a severe impact on the Bureau's operations and ability to fulfil its obligations as outlined in the Meteorology Act (1955).

If you have any questions about the content of this submission, please contact the Bureau's Spectrum Manager, Paul Hettrick, either by email to P.Hettrick@bom.gov.au, or telephone at 03 96694240.

Yours sincerely,

Dr Sue Barrell
Deputy Director, Observations and Infrastructure

**Bureau of Meteorology Response to the
Department of Communications
Spectrum Review Potential Reform Directions Consultation Paper,
November 2014**

Proposal 2: Establish a single licensing framework.

The Bureau of Meteorology (the Bureau) as a 24/7 operational public sector agency delivering high-public-value services in support of safety, security and economic productivity, and with explicit obligations under the *Meteorology Act 1955*, has a requirement for certainty in its ongoing access to certain frequency bands for both active and passive sensing applications, most of which will remain essentially unchanged for the foreseeable future. The Bureau's spectrum needs are largely met by long-term certainty of licences in predominantly internationally harmonised bands, and protected from levels of interference that would impact the effectiveness of the systems utilising these bands.

It is especially hard to comment on the implications to the Bureau of the proposed transition to parameter-based licensing in the absence of implementation details for this proposal.

The current practice of assessing the potential impact of interference from new RF technologies on existing applications must not be overridden by the goal of increased flexibility of spectrum re-allocation. While new technologies such as cognitive and ultra-wideband (UWB) radio promise many benefits through the more efficient use of spectrum, if incorrectly applied they will pose a threat to the ongoing interference-free use of active and passive sensing bands.

The introduction of cognitive technology (as outlined in Case Study1: Spectrum Sharing) that provides dynamic access to diverse spectral bands by utilising the opportunistic approach of "listening" for transmissions before using spectrum, must be conditional on explicitly avoiding passive sensing bands, which by definition, won't have anthropogenic transmissions acting as an "in-use" marker for such devices to detect. The potential ubiquitous deployment of consumer-level technology using low-power UWB techniques, which proponents claim can operate across bands used by other services without causing interference, has been shown through modelling to increase the noise floor for passive microwave radiometers on meteorological and Earth observations satellites. This would lead to undetectable contamination of the data, resulting in erroneous outputs that will adversely impact downstream applications of this data, such as long-term climatological records and numerical weather prediction and climate models.

The inclusion of a parameterised method of recording the resilience of a device to interference should be considered as part of a single licensing framework. Meteorological and remote sensing applications cannot recover information lost due to interference, and therefore have a considerably lower resilience to interference compared to digital communications-based applications.

Proposal 3: More flexible allocation and reallocation processes

Stakeholder consultation, as currently used by the ACMA in its spectrum management role, must continue with even more focus under any new legislative framework that aims to promote more dynamic spectrum allocation and re-allocation processes.

This proposal mentions the concept of private band managers which is further elucidated in Case study 2. There are numerous possibilities cited for how such a concept could be implemented. It is difficult to determine how the Bureau would benefit from any of these possible types of band managers, except to say that tangible and proven benefits would be necessary to justify any associated increase in costs. As outlined in the Bureau's response to Proposal 9 below, the devolution of spectrum management roles to the private sector would not automatically result in cost savings to the end consumer of spectrum.

Further details of the scope of private band management would be required for the Bureau to assess any future impact on its operations.

Proposal 4: Establish a more transparent and flexible approach for spectrum pricing to promote efficient use and re-use of spectrum

The Bureau supports the provision of exemptions from the market-based approach to valuing spectrum. The regulatory frameworks of other developed nations allow for exemptions for spectrum that is required for public interest including safeguarding sovereignty, national security and public safety.

The model used by the ACMA to value spectrum should be consistent with that used by public interest organisations so that independent valuations are based on a common methodology. However, even with such a methodology in place, the process of valuing spectrum used for public good can be problematic, relative to the fairly standard methods to determine valuations based on potential fees from licensing for commercial communications applications that have well defined business models. A market-based model where public good users are placed in direct competition with commercial bidders for spectrum is clearly not appropriate, and would not be in the best interests of the Australian public.

The Bureau has no control over most of the spectral bands it uses, resulting in little or no flexibility in being able to perform a given function in an alternative band that may have a lower opportunity cost. The bands used are determined by the natural processes being observed, and by international harmonisation of these and other bands that are then incorporated into the design and manufacture of equipment that competes in a relatively small marketplace compared to communications equipment manufacturers. The use of incentive pricing for licences without due regard for this inherent absence of spectral flexibility, would have the effect of increasing the Bureau's operating costs to the detriment of its ability to maintain service levels, assuming that there is no commensurate increase in the Bureau's annual budget allocation.

The Bureau is prepared to engage with other stakeholders and the ACMA in the development of a pricing policy for administrative allocations of spectrum under a reformed framework.

Proposal 5: Structuring payment schedules for licences

The Bureau supports the development of more flexible fee payment structures and timing, particularly in concert with the proposed changes to licence terms. For example, the Bureau's spectrum requirements favour longer term licences, with its budgetary process benefiting from an annual fee payment schedule.

Proposal 7: Payment of compensation for resuming all or part of a licence

The compensation model proposed appears to be subject to conditions that would limit its effectiveness in achieving the aim of increased flexibility in spectrum re-allocation.

A more effective and equitable model of compensation would be based on the (presumably higher) licence value of the spectrum being re-allocated, the societal and economic value of the incumbent service(s), and the costs associated with incumbents vacating the spectrum by either relocating to a geographical area where the value of the same spectrum is lower, or upgrading or modifying equipment to occupy less bandwidth or to utilise an alternative band where possible. Consideration of this type of compensation is conspicuously absent from the current legislative framework and needs to be included in a reformed system if the anticipated flexibility in spectrum allocation and re-allocation is to be realised.

The design and supply of filters for aeronautical radars in the UK in order to mitigate interference from IMT systems anticipated to begin operating in the 2.5 GHz band (adjacent to the 2.7-2.9 GHz radar band) is a recent example of a national spectrum regulator (OfCom) providing financial assistance to help ensure public safety through the continued operation of the air traffic control service.

Proposal 8: Facilitate greater user involvement in spectrum management

The Bureau's views on the delegation of some ACMA roles to private band managers are outlined in the response to Proposal 3 above.

Proposal 9: Develop more principles-based device supply regulation

The Bureau is supportive of measures to increase compliance of devices supplied to the Australian market, particularly devices permitted to be used under a reformed version of the current class licence category. Once such devices are released to the consumer market it is very difficult if not impossible to recall them or stop their use should they be found to cause interference to devices such as weather radars that are fully accountable within the licensing framework.

The first paragraph in this proposal implies that the ACMA's current role in resolving technical issues / disputes by monitoring and locating sources of interference should be reduced, as the associated costs largely flow through to industry and the consumer. Given that the level of interference will not decrease into the future, and will most likely increase with higher density use of spectrum by many varied applications, modulation schemes and spectrum re-use, the costs of locating sources of interference and resolving disputes would simply be passed directly to industry who would have to undertake the investigatory role currently performed by the ACMA. Industry would then proceed to pass these costs on to the consumer, therefore the suggestion that the consumer would benefit from lower costs of a decreased ACMA role is flawed. The Bureau and

similar public good organisations, as "consumers" of spectrum, would have to directly bear the costs of resolving interference issues, but without a business model through which to recoup these costs.

The Bureau proposes that the ACMA's role in device compliance and interference dispute resolution should be increased rather than decreased as part of a reformed framework. This includes the provision of sufficient staff resources and state-of-the-art equipment deployed nationally to effectively undertake this increasingly vital function. As mentioned above, instances of harmful interference will only increase in the process of striving for the more efficient use of spectrum.

Proposal 10: Improve regulation by extending the suite of enforcement measures available to the ACMA

As outlined in the response to Proposal 9, the Bureau is supportive of measures to provide the ACMA with increased powers to enforce electromagnetic compatibility compliance of devices supplied to the Australian market, particularly those permitted to be used under a reformed version of the current class licence category.

Proposal 11: The ACMA to continually review options for allocating spectrum to alternative/higher value uses and to ensure that barriers to achieving this are reviewed and removed where appropriate

The implications of this proposal for the Bureau and other public good users of spectrum depend largely on how the value of spectrum is determined. That is, the value of how the spectrum is currently being used compared to the potential monetary value that a commercial entity is prepared to pay for the right to use it, coupled with the perceived economic value of the services they subsequently offer. The views elucidated in the Bureau's response to Proposal 4 also apply to this proposal.

Stakeholder consultation, as currently used by the ACMA in its spectrum management role, should continue with even more focus under any new legislative framework that aims to promote a more dynamic spectrum allocation process.