

**Technical Discussion Paper**

**Technical Coordination between  
Managers**

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Discussion Document – For Consultation

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## Introduction

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1. The Review of Radio Spectrum Policy in New Zealand (completed in 2005) indicated that an opportunity existed for the Ministry to take a more pro-active role in coordination issues. A workshop on coordination was held last year to provide managers an opportunity to engage with the Ministry and to work together to manage interference and maximise business opportunities.
2. From the workshop, there appear to be three primary challenges to coordination: strategic interest; engineering issues and knowledge issues. These coordination issues may be resolved by regulatory prescription or through voluntary mechanisms.
3. This discussion document provides further consideration of the issues identified and presents a number of proposals that may be used to improve technical coordination.
4. The intention is to seek input for the next workshop with managers.

## Context

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5. The management of land and real estate is often used as an analogy when describing the framework of radio spectrum management in New Zealand. Where there can be boundary (e.g. fence type and colour) and use disputes (e.g. organic farming versus the use of pesticides on neighbouring property) between land owners, disputes can also arise between managers in the use of management rights. The likelihood of any disputes occurring can be prevented, or at least minimised, through suitable coordination between the managers.
6. The recent Review of Radio Spectrum Policy in New Zealand quoted the 1988 Nera Report<sup>1</sup> and identified that “the advantages of a market system are tempered....by the notion that a spectrum market could involve numerous bilateral transactions.”
7. Experience has confirmed that technical coordination, foreseen in the Nera Report, is required in order to effectively manage spectrum which is adjacent in frequency to spectrum managed by another manager. This issue has been highlighted in disputes on at least four occasions in the last 15 years. These disputes have largely been resolved by the parties agreeing to work with each other, including coordination of the rollout of systems.
8. With the increasing deployment of services within private management rights, there is a heightened risk of disputes arising between managers.
9. The Ministry has provided advice and support to rightholders in response to individual disputes and in relation to technical coordination issues on an individual basis. However, the Review of Radio Spectrum Policy in New Zealand indicated that an opportunity existed for the Ministry to take a more pro-active role in coordination issues. Consequently, a workshop on coordination was held last year to provide managers with an opportunity to engage with the Ministry and to work together to manage technical interference and maximise business opportunities.
10. Following presentation of background material and suitable scene-setting, the workshop considered two main questions:
  - the challenges to coordination; and
  - mechanisms to address coordination issues.
11. Information gathered from the consideration of these two main questions forms the basis for issues outlined in this discussion document.

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1 The Nera Report 1988 formed the economic basis for enacting the Radiocommunications Act 1989.

# The Challenges to Coordination

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## Strategic Interests

12. There appear to be three primary challenges to coordination. The first relates to commercial pressures, or business strategy. Each manager has equal interest in the radio spectrum, however strategic advantages can be gained through:
- being the first to register spectrum licences;
  - refusing to negotiate in a timely manner; and
  - registering licences that impede the plans of an adjacent manager.

## First in Time

13. The term “first in time” relates to the manager being the first to register a spectrum licence. The manager can gain a strategic advantage over an adjacent manager by registering licences on frequencies and at geographic locations that protect a proposed or even a theoretical service.
14. Two sections of the Act are most applicable:
- Section 25(5)(d) requires that a radio engineer’s certificate must certify that, inter alia, the exercise of rights to which the spectrum licence relates is technically compatible with services authorised to be operated under existing spectrum licences and radio licences.
  - Section 109A of the Act outlines the matters that are relevant to arbitration. One of the matters an arbitrator is required to have regard to, is “which of the spectrum licences held by the parties to the dispute was registered first”.
15. Where a manager is first to register spectrum licences, all subsequent licences must be assessed in terms of existing spectrum licences, regardless of whether there are transmissions in accordance with those licences. In the event of harmful interference occurring, if all other things are equal, then the subsequent, later, spectrum licence will be at a disadvantage in any decisions made by an arbitrator.
16. By registering licences “first in time”, the manager protects their position by ensuring their service will not be affected by any actions of the adjacent manager.

## Refusal to Negotiate

17. Investment opportunities can be maximised, or affected by timing. A simple refusal to negotiate, or deliberate delays, can affect the party who wants to move forward with utilisation of a management right and implementation of a radio service.

## **Deliberately Blocking Access to Spectrum**

18. Associated with using “first in time”, a manager can gain a strategic advantage over an adjacent manager by registering licences in close frequency proximity to a management right boundary and at prime geographic locations. The manager may not have any intention to operate in accordance with the licences.
19. This approach could be used to:
  - protect options for future rollout of services, even where decisions on the future services have not been taken; and
  - deliberately inhibit service rollout and increase the costs associated with implementation of an adjacent manager’s service.

## **Comment**

20. Use of tactics, such as those outlined above, could lead to increased capital expenditure costs and accusations of bad faith from adjacent rightholders.
21. It should be noted that a manager can create difficulties for an adjacent manager even without any strategic intention to do so. For example, coordination between managers may be delayed, with consequential costs to one manager wishing to coordinate and rollout a new service, simply because the second manager has no plans, or is still developing plans, for the use of a band.
22. There is no suggestion that any manager has strategically and deliberately set out to create difficulties for an adjacent manager. Some concern has been expressed over the possibilities of this occurring however.

## **Engineering Issues**

23. The second challenge to coordination relates to engineering, or technical issues. Two situations are outlined as examples below. The examples describe situations whereby a technology neutral approach in relation to assigning management rights allows managers to make different technology choices with consequential downstream challenges to coordination. These examples are not the only situations where engineering or technical issues can arise.

## **FDD versus TDD**

24. Modern radio systems, for example wireless local area networks (WLANs), are designed to be implemented using either frequency division duplex (FDD) systems or time division duplex (TDD) systems. They are designed to work most efficiently when operated in separate environments and not in bands immediately adjacent to each other.
25. This issue is not new to radio spectrum management. Land mobile systems have utilised semi-duplex (two frequency) and simplex (single frequency) systems for many years and engineering of land mobile bands has been completed in a

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manner that the likelihood of interference is minimised. In this instance, the management right owner determines which system to implement and the decision can significantly affect an adjacent manager.

## **Fixed Service versus Mobile Service**

26. The engineering techniques used for mobile services, such as cellular telephones, are quite different to those used for fixed services applications, such as microwave radio. There are significant differences in the two areas. These include:
- point to multipoint and multipoint to point versus point to point (affecting the engineer's ability to predict interference);
  - quality of service requirements;
  - power output;
  - antenna requirements.
27. While these services may operate in adjacent bands in many parts of the spectrum, there are engineering issues that need to be addressed to ensure the likelihood of harmful interference is minimised. As outlined above, the management right owner determines which service to implement and the decision can significantly affect an adjacent manager.

## **Knowledge Issues**

28. The third challenge to coordination relates to different levels of understanding of the Act, Regulations, the needs of adjacent managers and how technical issues should be interpreted. Familiarity with the Act inevitably leads to companies holding different interpretations or expectations, with consequential effects on the coordination process.
29. In addition to issues about knowledge disparity, a view has been expressed that the Act, Regulations, International Radio Regulations (IRR) and associated definitions are insufficiently clear which can lead to engineering misunderstandings during coordination discussions. For example, Schedule 1 of the Act requires that "every person transmitting radio waves must comply with the International Radio Regulations." While there is no question that the Schedule applies to managers and the spectrum licences created within their frequency bands, there is some uncertainty as to how the manager should interpret and apply a document that is a treaty between member states of the International Telecommunications Union (ITU).

## Options

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30. Two broad approaches have been identified to address the challenges of coordination – regulatory options and voluntary options.

### Regulatory Options – Use of Statutory Powers

#### Reference Standards

31. One way of prescribing coordination between managers is to publish a generic standard on coordination, applicable to all managers. Necessarily, such a standard would be wide in scope but it could present information on principles and procedures to support effective coordination.
32. It has been suggested that the Ministry issue reference standards under section 133 of the Act to require, or guide, managers in coordinating use of their management rights. Reference standards issued under that Act are taken into account in two situations:
- a matter relevant to a radio engineer’s certificate (section 72A of the Act); and
  - a matter relevant to arbitration (section 109A of the Act).
33. There are no situations outlined in the Act that require a manager to have regard to reference standard when making decisions relating to the operation or use of a management right. On this basis, changes to the Act would be necessary if it is determined that coordination between managers should be prescribed; and that a reference standard is an appropriate means of achieving the prescribed coordination.
34. In creating such a prescribed coordination requirement, consideration would need to be given to available remedies where parties are dissatisfied. Remedies could potentially include:
- reference to mediation;
  - reference to arbitration;
  - directions on the use of radio spectrum; or
  - a requirement to surrender a portion of spectrum held.

#### Other Regulatory Options

35. A number of options have been identified that are “variations on a theme” in terms of ensuring parties are able to discuss and satisfy their coordination needs prior to use of the spectrum by either party, rather than attempting to deal with issues after the identification of harmful interference.

36. Introduction of a pre-licensing coordination process within the Act would provide an opportunity for parties to discuss their intentions and issues prior to implementing more formal processes such as mediation or arbitration. The nearest legislation providing similar opportunities for this type of forum is the Resource Management Act (RMA)<sup>2</sup>. The benefit of this process is that parties have an opportunity to discuss and reach agreement on a mutual basis. While this opportunity exists presently, a structured form of agreement such as may be present in legislation may ensure that sensible, fair, agreements can be reached, even in situations where there is unequal bargaining power.
37. The introduction of a mediation step prior to arbitration would ensure that parties have an opportunity to discuss and resolve any issues. If necessary, this could be completed in a neutral setting and with a view to enabling a mutually satisfactory outcome. Parties may be encouraged to resolve any issues during mediation if compulsory arbitration (with a binding outcome on the rightholders) is a subsequent step where mediation is unsatisfactory.
38. Currently, the Act provides for the arbitration procedures to be invoked only once licences have been granted and registered. This process also requires the spectrum licences to have been assessed in terms of technical compatibility with already existing radio and spectrum licences. These procedures are largely unhelpful to managers considering overall system design and implementation. The Act would need to be modified to allow arbitration to be invoked at an earlier stage to assist rightholder coordination prior to the registration of spectrum licences.
39. In a situation where the Act's provisions have been widened to allow a manager to invoke arbitration if they can't create licences due to the location, frequency or service provided by an adjacent manager's licences, it is clear that the burden of coordination may shift from the manager creating new licences to the manager who has existing licences. This is likely to be an untenable situation for the manager with existing licences in a situation where he or she has been unable to identify the likely technology to be used by an adjacent manager.
40. As outlined above, there is some uncertainty as to how a manager should interpret and apply Schedule 1 of the Act relating to the IRR. For example, the IRR provides for member states to register assignments in the Master International Frequency Register and provides processes for managing interference issues that arise between member states. The extent of a manager's involvement with, and understanding of, the IRR may affect their ability to coordinate services. It has been suggested that Schedule 1 of the Act should be modified to provide greater clarity of the applicability of the IRR to managers and its role in technical coordination.

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2 It is noted that the RMA provides for all potentially affected parties to provide submissions on issues, not just immediate neighbours.

41. It has been suggested that the introduction of prescriptive co-location requirements would assist with the introduction of mobile services. Management rights are created in frequency bands and the managers are adjacent to each other in frequency terms. Interference, however, occurs as a consideration of spectral (frequency), spatial (geographical) and temporal (time) dimensions. The coordination between managers to minimise interference between proposed services may consider resolution in one or all of the dimensions outlined above. Co-location requirements may provide a means to assist with the introduction of new services in a timely manner, however it is not clear how they alone provide a means to address issues relating to coordination.

## **Comment**

42. By prescribing actions to be taken by managers with respect to coordination, there is an increase in certainty, however there is also a corresponding loss of flexibility for managers to exploit their management rights.
43. The introduction of reference standards, or the creation of a regulatory process that must be used before a manager is able to introduce new services creates a barrier to investment as a result of the timeframes required. The cost of such barriers could be significant. These costs need to be offset by the gains that would accrue from the processes implemented.

## **Voluntary Options**

### **Management Right Conditions**

44. It is possible that some form of coordination guidance could be provided through the inclusion of suitable conditions on management rights. While not strictly a regulatory option as the content of the condition is a matter to be determined by the Crown, or between the Crown and a manager, it is acknowledged that there is an element of compulsion associated with this option.
45. The Act is largely silent on the contents of a management right, however the Radiocommunications Regulations 2001 (the Regulations) provide for management rights conditions “that apply to licences created in relation to the record of management rights”. One view is that only conditions applying to licences may be considered suitable for inclusion on a management right. This view has not prevented conditions relating to issues such as foreign ownership appearing on management rights.
46. In one example, the Crown could place an obligation on a management right requiring a particular technology, or system, to be employed within the management right. Suitably identified technologies within the management right conditions would direct a manager in the use of the band, albeit at the expense of flexibility of choice.

47. An alternative approach would be for a condition to require the manager to consult and coordinate with neighbouring managers, perhaps without providing specificity. Conditions such as this are likely to be difficult to enforce should difficulties arise.

## **Contractual Obligation**

48. Most transfers of management rights from the Crown have involved a sale process, typically through a competitive tender or auction. These processes provide the Crown with an opportunity to create specific coordination obligations as part of the sale process. Spectrum caps and limitations on commercial associations are examples of purchase conditions the Crown has employed in recent years.
49. One example of a contractual condition could include limiting the creation of licences near a management right boundary unless a coordination agreement has been reached with the adjacent manager. Effectively, this would provide a de facto guard band at the management right boundary. A similar approach has been employed in relation to geographical boundaries between licences in the Crown management rights at 3.4 GHz and 3.5 GHz.
50. Contracts could include requiring the formation of a group of managers soon after completion of a spectrum auction. This group would undertake any necessary coordination prior to implementation of services within the bands. It is likely that a time limit would need to be applied to encourage a timely conclusion of coordination.
51. Contractual obligations have the benefit that:
- they may be employed immediately (no legislation changes required);
  - there is no risk that they may be outside the legislative framework;
  - they are not limited in terms of complexity or content.

## **Voluntary Coordination**

52. Voluntary coordination could be promoted through the publication of one or more “standard” coordination agreements that could be used by managers in any coordination. Using a real estate analogy, this approach would be similar to the standard agreement drafted by the Auckland District Law Society and widely used by real estate agents when completing contracts for the sale of land.
53. Various ideas have been proposed in relation to implementing a voluntary coordination process. These include:
- Making agreements public, thus avoiding any potential for managers to be accused of dealing in “bad faith”;
  - Ensuring that coordination agreements are flexible for the managers.

## Other Voluntary Options

54. Ensuring that smaller managers have access to the same information as the larger managers would help ensure that no party is disadvantaged when negotiations are taking place.
55. Ensuring that Approved Radio Engineers (AREs) are well informed would ensure that, in detailed discussions, each party is able to discuss issues on their merits and on an equal footing, rather than being concerned about issues that may be either irrelevant or of relatively low importance. This would include ensuring that information relating to best practice engineering is available to AREs.
56. Allocating spectrum access rather than specific frequency bands may provide suitable opportunities for the implementation of new services while obviating the need for coordination relating to the differing uses of bands. This mechanism for management of the radio spectrum is referred to as “managed spectrum parks” and is under active consideration by the Ministry.

## Comment

57. While voluntary processes provide greater flexibility in exploiting management rights, a company’s strategic interests may still tend to dominate the coordination process.
58. It is noted that the type of agreement that may be reached between parties can vary based on the services proposed and the resulting potential for harmful interference to occur. Accordingly any process adopted must be both robust, but flexible.

## Proposals & Questions

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To stimulate discussion, the Ministry proposes the approaches outlined below in relation to coordination. It is emphasised that these approaches are proposed to stimulate useful discussion in relation to coordination issues, they do not form a final or complete position and do not represent Government policy.

**Proposal A** – The Ministry proposes to use a variety of options outlined above to assist managers with coordination. The decisions in relation to the options used will depend upon a variety of factors including, but not limited to:

- The amount of spectrum available;
- The ease of identifying suitable likely technologies;
- The views of industry members when assessing whether to create management rights in a band.

It is likely that the Ministry will employ conditions within sale contracts to either encourage or require coordination to be completed prior to creation of licences. The use of “de facto” guard bands will also be considered in the creation and transfer of management rights.

*Should the Ministry employ one option or a variety of options to assist managers with coordination? If only one option is preferred, please indicate which option, and why. If a variety of options are preferred, which are preferred, and why?*

**Proposal B** – The Ministry proposes, with the assistance of industry, to provide a suite of “standard” coordination agreements that may be used by managers when undertaking coordination. The Ministry also proposes to allow managers to publish their coordination agreements on the Ministry’s website.

*Should the Ministry assist industry in providing coordination agreements, or should this be between industry parties only?*

**Proposal C** – The Ministry proposes to review the reference in Schedule 1 of the Act with respect to the IRR (and make recommendations for change to Government if required), with a view to providing greater clarity to managers.

*Should the Ministry review Schedule 1 of the Act?*

**Proposal D** – The Ministry proposes to provide a voluntary mediation service should an impasse arise in any coordination negotiation between managers.

*Should the Ministry provide a mediation service where an impasse exists in coordination between management rightholders? How should this be funded?*

Are there any other issues or options to improve coordination the Ministry should consider? An assessment of likely advantages or disadvantages in implementation should accompany alternative options where they are suggested.

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# Submissions

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## Invitation for Submissions

Comments on the issues raised in this paper and the proposed policies for technical coordination between managers should be provided to Radio Spectrum Policy and Planning, Resources and Networks Branch, Ministry of Economic Development at: [radiospectrum@med.govt.nz](mailto:radiospectrum@med.govt.nz).

The closing date for submissions is **9 June 2006**.

## Review of Submissions

Following the closing of submissions, it is intended to hold a meeting in Auckland in mid-June 2006 to further refine options in relation to coordination. All respondents to this discussion document will be invited and encouraged to present their views. Copies of submissions will be made available to attendees prior to the meeting, accordingly your attention is drawn to the information below relating to the Posting and Release of Submissions and the Privacy Act 1993.

## Posting and Release of Submissions

The Ministry may post all or parts of any written submission on its website at [www.rsm.govt.nz](http://www.rsm.govt.nz), or in documentation at meetings attended by the public. The Ministry will consider you to have consented to posting, or otherwise publishing the material, by making a submission, unless you clearly specify otherwise in your submission.

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