Submission to the Productivity Commission Regarding the Review of Radiocommunication Acts and of the Market Based Reforms and Activities Undertaken by the Australian Communications Authority

12 October 2001

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1.0 About FuturePace Solutions

Spectrum Management International Pty Limited, trading as FuturePace Solutions, is privately and jointly owned by Barbara Phi and Michael Whittaker. The company has operated since 1997 and is headquartered in Canberra. Michael Whittaker was principally responsible for designing the Australian 500MHz, 800MHz, 1.8GHz, 3.4GHz and 28/31 GHz spectrum licensing technical frameworks.

Our company specialises in the certification of RF regulatory compliance. We have developed the services in Attachment A in response to the out-sourcing by the ACA of much of their liability in relation to their certification function. We were the first company to certify and register devices under Australian spectrum licensing rules, in December 1998. FuturePace has a long-term commitment to professional research and the development of general and cost effective spectrum solutions for network, regulatory and public interest matters. FuturePace Solutions has no contractual obligations towards any particular type of equipment, does not endorse products and does not own spectrum.

In addition to this submission, we ask the Commission to take account of recent relevant substantive studies authored by FuturePace[1] as well as a publicly available round-by-round description and candid commentary of the Australian 2 GHz auction to be found at:
futurepace.com.au/auctionresults/auctionbackground.htm

Another relevant FuturePace paper is to be published by the IEEE later this year at which time we will forward of copy of that paper to the Commission.

[1] Whittaker M.J. "Establishing an Interference Management Framework for Spectrum Licensing in Australia" IEEE Communications Magazine, April 1998; and Whittaker M. J. "Australia's Airwaves for Sale" Mobile Asia-Pacific February/March 1999 Vol. 7 No. 1.

2.0 The FuturePace Focus

FuturePace appreciates the opportunity to comment on radiocommunications issues in the context of the Productivity Commission inquiry and we are responding to a number of different issues affecting our business activities.

FuturePace is especially concerned about the proposal to develop a new 'single more flexible licensing system' for radiocommunications systems. The ACA is already, because of the high level of flexibility provided in the current Act, providing a number of different licensing solutions consisting of different blends of highly specific apparatus and unbiased spectrum licensing. The proposal for a new licensing system has arisen in the context of achieving consistency between the regulatory regimes. However, the different blends of apparatus and spectrum licensing are already consistent in terms of their engineering basis, but are designed to serve different and very specific purposes. This consistency is not immediately obvious because some technical elements tend to be made visible in one form of licensing and hidden in another. The 'single more flexible license' proposal tends to ignore the valid policy and technical reasons for different licensing approaches in search of a simpler administrative solution, which may in fact be quite contrary to the interests of industry, and, in the implementation phase, not in fact so simple. In addition, the proposal ignores the considerable flexibility already available, which in many cases is not being utilised to its full extent.

We see any new licensing solutions as unlikely to be in fact single, given that a purposive definition of each licence type would suggest the need for differentiation between different approaches to licensing. What is more likely is a single descriptor with a series of sub-sets which broadly reflect current practice, given that there are good technical and policy reasons for the development of the existing pattern of licence definitions. And, we see no reason for further costly consultation and policy development. We will discuss our rationale in detail later in this document.

2.1 The Cost and Mechanism of Government Consultation

We are conscious of the cost to industry of proposed additional 'wide consultation' especially in relation to the proposal for a 'single more flexible licensing system'. This will mean further protracted and, in our view, unnecessary government consultation, especially when this is offered in lieu of cogent policy development within the Government sphere. It means that industry is providing a considerable amount of free consultation to Government and industry, especially the SME component, is increasingly unable to provide such services without detriment to their own productivity. On the other hand there is some concern about the Government's ability to provide quality advice, given the flight to private industry of many of it's highly trained technical specialists in the wake of Government out-sourcing policies. And we are disappointed but not necessarily surprised that a Government which promotes a 'user pays' philosophy does not seem to recognise itself as a 'user'.

The ACA often calls for submissions and perhaps assumes, based on the replies, that it has the totality of industry views. With the significant issues confronting the industry at this time there is often too little time to be able to respond to the plethora of Government requests for comments which, in a time of reducing budgets, staffing levels and options, often means that there is neither time nor budget for the level of input from all industry sectors which should, and would in more ideal circumstances, be involved. This is not conducive to open debate and achieving the best result for industry.

Within ACA consultative mechanisms, the Radiocommunications Consultative Council does not have representation from SME's nor from the Accredited Persons Forum, and these are the people who actually have to adjust within their own businesses to implement licensing changes. The accredited persons forum meets very infrequently and rather than being a conduit for feedback from the industry, it usually comprises an ACA information session.

It is not a consultative forum as such, there is in fact no means by which the interests of technically oriented firms can bring their views to bear on the ACA except by representations.

A most important concern is the relative absence of external judicial review of ACA decisions. There are very few aspects of the legislation which are subject to any form of external review.

The end result of the current approach to policy development and consultation is that SME's have imposed upon them solutions which are designed, often without their involvement, and for which they are expected to develop solutions and expend on R&D. Our own R&D commitment is over 60% of our gross earnings.

FuturePace is concerned at the lack of certainty that the constant re-visiting to licensing issues is raising within the industry. We draw to the attention of the Commission that the first registrations under spectrum licensing rules did not occur until December 1998. We consider it very early days to be considering any fundamental changes to the system.

At the behest of Government and the ACA, we have invested significantly in creating tools to manage the technical and regulatory challenges of spectrum licensing. Many of our clients have also made huge investments in infrastructure, training and manpower development and any changes at this early stage would represent significant bad faith on the part of the ACA and the Government, in that industry was specifically encouraged to develop the means of managing an innovative technology which the Government now apparently seeks to fundamentally change, rendering much of the R&D potentially redundant.

2.2 What is Technological Neutrality?

While the provision of spectrum licensing in the Act has caused both the Regulator and industry to consider licensing in broader terms, some of the solutions achieved have not been satisfactory. Spectrum licensing is often promoted as being technologically neutral. The 3G licences and converted 2.3 GHz licences (MDS) were said to be neutral but were actually biased, for example, 3G was biased towards use of WCDMA. While we do not object to the ACA marketing biased licences, in the context of 'buyer-beware', we believe there should be more information in the public domain concerning the practical and commercial effects of that bias especially in any marketing documents.

We understand neutrality to mean that roughly the same amount of spectrum space (per unit information capacity) is required to operate any service configuration. The ACA appears to use the definition that all service configurations of equipment may be operated as long as you have sufficient space. But failure by a bidder to understand that may mean that licensees either do not buy sufficient spectrum or need costly modifications to their equipment.

As well as being biased, the 3G and MDS licences were partially defined. We will later explain the additional costs to licensees caused by partial definition, in effect the sale of an undefined product. We are concerned that the recent design of the 3G licences is the beginning of an ACA 'simplification' drive that will lead to much greater marketplace complexities for spectrum licensees. The type of 'simplification' provided by the ACA reduces certainty and flexibility, without any concomitant benefits of less responsibility and lower costs.

Just as there are no rules in the Radiocommunications Act offering direction on when spectrum licensing is to be used in place of apparatus licensing,

there are also no directions on what form the spectrum access conditions should take (except for the core conditions).

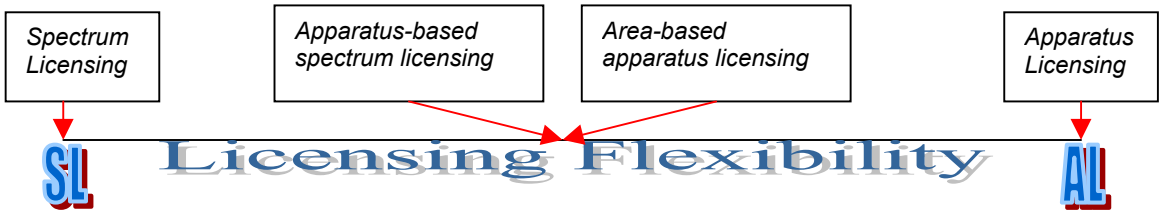
Later in our submission we will discuss the importance of access conditions, however, for the moment it is sufficient to understand that the access conditions play a critical role in determining how much spectrum is required to be acquired for a particular purpose.

2.3 Existing Licensing Flexibility

The ACA have sold spectrum licences having access conditions that vary considerably. In this regard, it may be useful for the Productivity Commission to think of unbiased spectrum licensing and highly specific apparatus licensing as the opposite ends of a straight line. The Act is very flexible and allows a continuous range of spectrum management methods between the two extremes. With reference to Figure 1, the centre of the line is where spectrum licensing meets apparatus licensing. This common meeting point can either be called:

- Area-based apparatus licensing; or
- Apparatus-based spectrum licensing.

Figure 1. Range of Licensing Flexibility Available to the ACA



The 'single more flexible licensing system' already exists. It is the complete 'line' between spectrum and apparatus licensing. And, rather than being technology neutral there is a wide range of technology bias available to the ACA within this licensing flexibility (see Figure 2.).

Figure 2. Range of Technology Bias Available to the ACA

Technology Neutral (Unbiased) *(Biased) Technology Specific*

And, the different spectrum licences and apparatus licences issued to date may be assigned a position at a number of different points of that 'line' (see Figure 3. for examples).

Figure 3. Range of Licensing Flexibility Used by the ACA

3.4 GHz *2GHz* *2.3 GHz* *MDS*

We believe the ACA could use other 'points' in response to specific industry requirements, for example, the ACA has not yet taken advantage of using an apparatus-based spectrum licence when an apparatus type licence, but with a term longer than 5 years, is required.

3.0 Access Conditions for Spectrum Licensing

We believe that some of the technical fundamentals of spectrum licensing are not well understood, even within the ACA. To ensure the points made in our submission are clear, a short description of spectrum licensing follows.

Spectrum licensing provides a means of device authorisation within a defined spectrum space for a single licensee. The space is defined not only in terms of geographic area, bandwidth and time (the core conditions), but most importantly and often overlooked, through all the other licence conditions that limit access to the spectrum for devices (the access conditions). Access conditions contribute significantly to the level of utility of the spectrum and hence to it's value. The combination of core and access conditions do not directly manage interference but create a basis for designing coordination rules for the management of interference by the licensee, across both the area and frequency boundaries of licences. The access conditions incorporate levels of receiver protection in either a direct or indirect manner and generally ensure that there is equitable spectrum access on both sides of the area and frequency boundaries.

As a general principle, the access conditions cannot be made simpler than the physics that describes the various interference mechanisms, without leading to inefficient use of spectrum. If access conditions are simplified using only worst case constraints (they have been called 'taboos' in the USA in reference to their lack of rationale) instead of accurate modelling where necessary, operational costs increase, and productivity of the spectrum reduces, through 'over-engineering'.

3.1 Managing In-band and Out-of-Band Interference

There are two main types of interference that must be managed by the licensees (or their out-sourced accredited persons):

- In-band interference; and
- Out-of-band interference.

In-band interference may be caused over large distances by co-channel (same frequency) emissions from a device operated under an area-adjacent spectrum licence. Licensees manage this interference, by knowing, under the licence conditions, the maximum level allowed to be radiated from a specified site in an adjacent area. Licensees then determine on a risk assessment basis, how far their receivers must be set back from the area boundary in order to cope with that allowed maximum level.

In-band interference may also be caused over short distances by the out-of-band emissions which are incidental to the use of a frequency adjacent spectrum licence or service. There are limits for the allowed levels of these emissions. Spectrum licensees manage this interference by determining the isolation requirements for their receivers with regard to these limits and the likelihood of the presence of transmitters operated under frequency-adjacent licences. Interference of this type, which is steady and continuous, can affect the useable range of received signal levels, which in turn affects the maximum communication distance of mobile services. Interference of this type, which is transient in nature, can reduce the communication capacity of a system through lost and re-sent data.

Out-of-band interference[2] occurs when transmitters and receivers operate close together in terms of distance and/or frequency. Out-of-band interference may be caused over short to medium distances, not directly by co-channel emissions, but by having the energy pollute those frequencies through a number of special mechanisms. This form of interference should not be confused with the type of in-band interference caused by out-of-band emissions that we have discussed in the previous paragraph.

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[2] ***out-of-band interference*** means interference:

(a) relating to selectivity, blocking, intermodulation immunity and spurious response immunity; and

(b) caused by emissions at frequencies outside the frequency band of the spectrum licence;

This definition of out-of-band interference relates to specific interference mechanisms and should not be confused with 'out-of-band emission', a term used in apparatus licensing to refer to emissions at frequencies outside a channel.

When possible, licensees can manage out-of-band interference in a simple and spectrum efficient manner by complying with access conditions relating to deployment and power constraints for transmitters. These constraints are based on effective antenna height and tend to keep transmitters and receivers apart from each other, to a degree where out-of-band interference is unlikely. However, when this simple interference management technique is not appropriate, guard space (guard band and guard area) is used to manage the interference. This guard space is created by licensees using part of their own spectrum at the boundary edges of licences. The facility to authorise device operation under the provision of guard space leads to access conditions providing maximum flexibility for the operation of different service configurations. Types of systems for which deployment constraints are not appropriate are, for example, single-frequency operation (TDD) where a base transmitter operates and then is turned off while the receiver operates, FDD repeaters and point to point services.

Calculation of the necessary amount of guard space is based on a fully defined minimum receiver performance. This includes a full description of the RF and IF selectivity together with a compatibility requirement defined as the likelihood of a maximum unwanted power spectral density at a receiver. This receiver model, together with models for out-of-band interference mechanisms, are used by a licensee to calculate the minimum guard space requirements for a transmitter that is not operated in accordance with deployment and power constraints. Similarly, the minimum necessary guard space requirements for the operation of receiver that does not exhibit at least the minimum performance may also be calculated. Unfortunately, the 3G access conditions recently designed by the ACA did not include full definition of the minimum receiver performance. And calculating guard space as well as resolving interference problems will now be problematical without a clear indication of exactly who is at fault and needs to act and at what cost.

Most importantly, the access conditions related to in-band and out-of-band interference do not seek to fully manage that interference. Instead, they draw 'a line in the sand' for the licensee (or accredited person) who then manages the interference using coordination procedures developed on the basis of these known reference points together with the details of existing devices that are registered in the ACA's national on-line centralised database.

3.2 National Centralised On-line Database

The level of flexibility available under Australia's system of spectrum licensing is not possible without access to a national centralised data base, the availability of which is critical to a scheme where coordination of devices at the boundaries is performed by industry. Obviously, the database is better managed in the hands of the Government, where it can be clear and transparent as to exactly which devices should be coordinated against at any particular time noting that responsibility for interference management is decided on a priority based on first-in-time registration.

Carriers in Australia are quite comfortable with a requirement to register their devices on a publicly available database with services related to national security held on a separate database administered by the ACA. The database requirements do not interfere with commercial sensitivities and have served to significantly reduce the cost of interference management through out-sourcing to industry.

In the case of spectrum licensing, from 1998, the database could be updated by sending data files, certified by an accredited person, for loading by the ACA. This has operated well, eliminating typographical errors and reducing costs. However, in the case of the established apparatus licensing, the ACA

has now been promising a similar process for several years and the failure to provide it is resulting in delays and inefficiencies for industry.

4.0 Product Differentiation – Spectrum and Apparatus Licensing

With reference to Figure 4. spectrum licensing provides a means of device authorisation and management of a space by a single licensee. Once space is carved out of the continuum by the ACA for management under spectrum licensing, the remaining space then also becomes defined. This remaining space continues to be managed by what may be considered an effective 'spectrum licensee': the ACA. And, apparatus licensing provides a means of authorisation for multiple licensees by the ACA within that remaining space. Similarly, an actual spectrum licensee may authorise multiple operators through the facility of third party authorisation, although, only limited use of this facility has occurred to date.

Figure 4. Managing Single and Multiple Licensees in the Same Space

While there is consistency with the engineering basis of both spectrum and apparatus licensing, the fundamental difference primarily lies in the different flexibility regarding number of licensees rather than service type:

- Spectrum licensing better serves a **single licensee**; whereas
- Apparatus licensing better serves **multiple licensees.**

This fundamental product differentiation lies in the fact that there will always be both large and small users of the radiocommunications spectrum in

Australia and both spectrum and apparatus licensing is likely to be required to serve them for a long time into the future.

To facilitate the fundamental difference, the rules associated with:

- Spectrum licensing are designed to manage **multiple service types** without managing the complexity of multiple licensees; whereas
- Apparatus licensing are designed to manage **multiple licensees** without managing the complexity of multiple service types.

While spectrum licensing facilitates the introduction of multiple service types there are economic reasons why that introduction will be sequential over a long period of licence tenure rather than concurrent.

The reason that an Appar-ectum licence (multiple service types for multiple licensees) is not attractive is that the cost of interference management between multiple service types tends to become extremely high as more and more types operate in close proximity. So it is not the complexity of the rules for access to the space of a spectrum licence that is paramount but the complexity of the rules for interference management between devices operating within that space.

We are not saying here that multiple service types will not concurrently operate under a spectrum licence. In fact, FuturePace is often involved in assessing and certifying this type of operation, even in broadcast spectrum. Rather, there is an economically driven tendency to operate the same type of service whether it be apparatus or spectrum licensing.

Since the introduction of spectrum licensing it is obvious that the spectrum licensees are, in the main, utilising their spectrum for a single service type with the interference within a spectrum licence managed for them by the equipment standard and it's equipment configuration. This is also what happens with apparatus licensing.

What is facilitated by a spectrum licence is licensee initiated change of service type, whereas under apparatus licensing a change of service type would require the consent of many licensees and potential changes to instruments such as the Australian Spectrum Plan. It is obviously easier for a single licensee to decide to change equipment within a spectrum space for which the licensee has direct managerial responsibility. Again, the focus comes back to the flexibility available to a single licensee as opposed to what is practical with multiple licensees. And, spectrum licensing allows an individual licensee to vary the business case and equipment type, within their own spectrum, for their own reasons and without initially exposing their business case to competitors. It is conducive to innovation and the delivery of excellence.

5.0 Demand for More Flexible Licensing?

The present Act was drafted in a manner allowing considerable flexibility[3] in licensing methods. That flexibility has been already used to offer a range of licensing solutions between the extremes of:

- Highly specific apparatus licensing for spectrum space managed by the ACA providing flexibility with regard to devices operated by multiple licensees; and

- Unbiased spectrum licensing for spectrum space managed by private industry providing flexibility with regard to multiple services.

We have also proposed that that this range of licensing flexibility, in effect, already represents a single licensing system.

The Radiocommunications Review reported that 14 respondents believed there should be a single licensing system and 27 respondents either have no definite opinion or disagreed. FuturePace disagrees with the opinion of the

[3] The reason for such a flexible Act was that no one at the time of the drafting of the Act knew how spectrum licensing would be implemented.

Communications Review that this illustrates '*strong support for the removal of the distinctions between spectrum and apparatus licensing'*.

Many of the respondents would have been in no position to debate the issue from anything other than an economic purist perspective, or based on a general administrative assumption that 'simple' is automatically better. Most of the respondents would not have owned or registered a device under spectrum licensing, except for the large company and one small company which disagreed, the latter presumably us, the company which specialises in spectrum licensing. The list of respondents to the Review also did not include the majority of persons accredited by the ACA to register devices under both spectrum and apparatus licensing. The only accredited persons who responded were FuturePace. We noted that the Review consulted with one of our competitors on the form of the review but that no formal submission was made by that company.

The single most important issue for the 14 respondents who supported a proposal for a single licensing system was the expectation that the 15 year tenure of spectrum licences would be transferred to any new single licensing system. This desire arose out of vocal and general dissatisfaction with the displacement of the point to point services after the 1.8 GHz auction and possibly other market factors such as lack of knowledge by overseas investors about the Australian system. The Review result was more a political solution than illustrative of deep commitment to a Grand Licence Unification Plan. And, most of the supporting reasons given in the Review report serve to demonstrate this.

Our concern is the loss of efficiency and national productivity by moving to a less technically robust hybrid system when all that appears to be necessary to achieve the outcomes sought by industry is more certainty for an apparatus licence – and we believe that this should only occur in certain cases.

Given that the 'single more flexible licence' concept:

- is at present theoretical and driven more by a desire for increased tenure for apparatus licences rather than any concept of increased flexibility when that is already provided by the range of available spectrum and apparatus licensing options;
- would require substantial changes to most areas of the existing Act;
- would require 'wide' and costly consultation by DCITA/ACA with industry;
- does not yet have proven workable implementation methods including the difficulty of implementing transitional issues;
- comes on the heels of the huge amounts of investment by private industry that have already occurred, not only in the spectrum itself but in implementing support systems for the existing licence structures;
- has been introduced before the concepts of spectrum licensing have been fully understood and the full potential realised by much of industry;

FuturePace believes the 'single more flexible licence' issue should be dropped.

6.0 Equipment Standards

While FuturePace does not have a great deal to do with some aspects of standards activities, such as C-Tick, we are deeply involved with the use of standards for apparatus and spectrum licensing. In relation to standards, the Review recommends that '*harmonisation between the technical regimes be accelerated*'.

In general, FuturePace has developed a common sense based aversion to the term '*harmonisation'* because it tends to cover standards with a heavy gloss enabling them to be talked about by people who often do not understand the actual mechanisms of their contributions to interference management and their disparate roles in apparatus and spectrum licensing systems. Standards are not necessarily able to be mixed and matched

because they are often developed for the three different radiocommunication environments established by the ITU. Standards are designed for homogeneous operation.

The attitudes of most people to standards have been formed by their past use in the ITU, as the focus of much of that activity is protectionist in nature which is entirely incompatible with a free market concept. The alignment of frequency usage is where most of the desire to '*harmonise'* originates and continues to operate. At the international level, even alignment of frequency usage between Australia and New Zealand, which are in the same frequency region, is difficult unless their traditional usage aligns. Changes to frequency alignment at the international level have tended to be a long term task because it is driven more by the creation of a world dominant technology rather than cooperation and agreement on common technology solutions.

6.1 Harmonisation through Generic Standards

For Australian spectrum licensing, the spectrum access conditions in effect create a generic equipment standard and that standard is usually, and most effectively, selected such that equipment access is not biased towards any particular actual standard. If the ACA decides to bias access conditions then it usually means that additional spectrum space, in the form of guard space will be required for the operation of equipment made to other standards. However, even then, the spectrum licence should be designed to require the minimum amount of guard space for those standards.

As far as Australia is concerned, the generic standard approach of Australian spectrum licensing (when it is fully defined, unbiased and designed for full flexibility) has already achieved '*harmonisation'* by breaking the nexus between the equipment standardisation process and obtaining regulatory approval to access spectrum, avoiding delays and effectively harmonising

spectrum use. The generic standard of a spectrum licence well suits the future generic software defined radio by providing the necessary optimisation flexibility at the radio interface.

Recent efforts in regard to apparatus licensing in Australia (through Standards Australia) have also focused on creating generic standards. A generic land mobile standard is available which incorporates internationally accepted (IEC60489-3) test methods as well as limits drawn from the Australian analogue land mobile standard in order to manage the interference associated with the co-existence of digital and analogue services operated by multiple licensees.

6.2 Relevance of Equipment Standards in Apparatus and Spectrum Licensing

The real and important function of standards is to manage interference between devices. And, while this is the fundamental objective for both apparatus and spectrum licensing, standards are also utilised in the following manner for each system:

- in the case of apparatus licensing, to encode many technical conditions (that must be made discrete in a spectrum licence), with the purpose of minimising the cost of the coordination process between multiple licensees;
- in the case of spectrum licensing, to help create a fully flexible generic standard through an averaging process that minimises bias to any one type of equipment. The process utilises not only the specifications of all currently available standards and theoretical models but also operational practicality, for example, use of transmitter filters, with the purpose of minimising the cost and maximising spectrum utility for operating multiple types of equipment by a single licensee.

7.0 When Access Conditions are Partially Defined or Biased

In general, spectrum licensing is more effective when the regulator keeps out of the market place, and when the revenue aspects of spectrum auctions are not paramount. In the case of the Australian 3G spectrum licences, the ACA interpretation of political statements resulted in the marketing of a product with partially defined access conditions that were biased towards WCDMA. This rendered the licences technologically biased, rather than neutral. The objective of spectrum licensing is to enable the licensee to achieve the best economic use of spectrum over the life of the licence and without the need for re-negotiation of licence conditions. When a spectrum licence is biased towards a particular technology it limits the capability of the spectrum licensee to realise the full economic value of the spectrum purchase over the full life of the licence.

7.1 Partial Definition

One of a number of FuturePace's concerns during the ACA's design of the 3G auction was with regard to fully establishing a minimum receiver performance on which licensees may base their coordination of devices across frequency boundaries. The ACA advised everyone, that '*it is up to the licensees to continue to develop the technical framework'*. Hopefully potential licensees also understood the limitations of the licences prior to purchase, because they have paid considerable dollars for the opportunity to enter into 15 years of ongoing negotiation with their competitors.

The ACA expressed the view that there was insufficient information available at the time they designed the 3G technical rules to allow full definition. However, it was FuturePace's considered and voiced opinion at the time, and still remains, that full definition could have occurred based on a mix of theoretical and practical equipment performance criteria. Alternatively the auction could have been deferred to allow time to achieve greater technical certainty, a solution not open to the ACA which was serving the revenue

needs of Government, meeting its own Key Performance Indicators and not necessarily focussing on the needs of industry.

Partial definition of the rules means uncertainty for industry, increased litigation and inefficient use of spectrum and higher costs to the consumer. It should also translate into lower costs for spectrum, although because of the lack of industry awareness of the effects of bias and partial definition of the access conditions, this was not reflected at the 3G auction, despite it not reaching the levels projected for the revenue.

7.2 Biased Licences

The ACA's biased design of the 3G spectrum licence conditions:

- maximised the level of allowable in-band interference from frequency adjacent licences;
- reduced flexibility with a requirement for unnecessarily increased guardspace to operate other types of equipment;
- provided an incomplete basis for the calculation of that guardspace; and
- saddled the licensees with a costly and potentially ineffective negotiation process with their neighbours to, as the ACA now require them to, '*continue to develop the framework'* over the next 15 years.

Owners of biased licences tend to lever an assumed right to limit competition off any Government decision to bias the licences. For example, the high prices paid for the UK 3G UMTS licences are likely to have ramifications for policy development for 3G services in other bands well into the future. Governments can avoid these situations by providing unbiased access conditions.

The ACA's position is that the Minister required the licences to be biased. FuturePace believes that the Minister did not have in mind for his directive to be interpreted as requiring that a significant advantage of the Australian system of spectrum licensing to be lost, that is it's capacity, because of the

absence of strict standards application, to absorb without bias into the Australian telecommunications environment the best available equipment from all other countries over the next 15 years. In the absence of a strong manufacturing base for telecommunications equipment in Australia, the recent approach is not likely to be beneficial.

FuturePace's view is that a spectrum licence should achieve an appropriate balance between flexibility and certainty. And, that minimising future negotiation between adjacent spectrum licensees is an essential requirement for certainty, given for example, the difficulties that have already occurred in obtaining agreement for the exchange and aggregation of 1.8 GHz auction lots into larger more efficient licences.

Clearly there are some economies in the use of standard equipment, especially for equipment suppliers. The use of a standard boxed, off the shelf product reduces costs to the supplier, minimises market specific tweaking of equipment and hopefully has a similar effect on the price offered to the carrier. The carrier suffers where the client/carrier business case, through the application of biased technical rules, suborns the integrity of a spectrum license purchase and limits the creativity and costs effectiveness of the licence, by trying to force the carrier into a specific technology. This is particularly the case where long term licenses are issued. Biased access conditions are simply another way of 'picking winners'. Even though the Government has clearly stated that it's policy is not to do so.

FuturePace's position is that the ACA has not fully concerned itself about maximising certainty, nor the dollar cost of future negotiation with adjacent licensees, in their design of the 3G spectrum licences. FuturePace seeks a clear policy directive to the ACA that future spectrum licences in other bands do not exhibit similar technical and market place deficiencies.

8.0 Proposed Longer Apparatus Licence Term with Compensation

We understand that in some instances the push for a 'single more flexible' licensing system with generally applied tenure of 15 years may to some extent be being driven by overseas practices where regulators have the power to issue licences which are possibly more attractive to potential investors than the Australian 1 to 5 year apparatus license system, noting that the Australian system has operated with informal licence renewal. It possibly should be made very clear now whether the ACA would, in instituting a new 15 year apparatus licence system, still reserve the right to resume a licence at any time should the spectrum be required for another purpose. Our assumption is that, given the rate of change in telecommunications, the ACA must, as a means of retaining policy flexibility, retain this power. We would think it reasonable that they do so.

That means that the ACA could as part of its necessary suite of regulatory tools, resume a 15 year apparatus license with the same impunity that it can now resume a one year licence. And it will do so if sound spectrum management practices requires that the spectrum be re-allocated.

If the potential for resumption is a given, then FuturePace has difficulty with the logic of longer licence terms. It simply means that Australian companies will have to explain our regulatory position more clearly to investors, or suggest that they buy spectrum licenses. It is open to the telecommunications community to suggest that additional spectrum be made available for spectrum licensing and open to the regulator to decide whether ongoing apparatus licensing is appropriate. Extension of essentially short term licenses should be discretionary, depending on prevailing demand for spectrum, and decisions should be fully reviewable.

It is highly unlikely that, with a 15 year term for apparatus licences the ACA would be able to sustain its position that no compensation is paid to apparatus licensee when spectrum is reclaimed. The present position is sustainable

because licences are issued for a limited period of time despite an assumption of renewal, and the 're-allocation period', usually of two years, is seen as sufficient time to allow the relocation of services with minimum disruption. This may be a less sustainable position where apparatus licences are issued for 15 years.

For this reason FuturePace does not support the longer license period for apparatus licences as it opens up scope for heavy compensation claims and also ties up spectrum in manner incompatible with the stated ACA desideratum of efficient spectrum usage. However, longer tenure for the operation of a specific device could be made available to a single licensee through an apparatus-based spectrum licence or to multiple licensees by having large blocks of spectrum managed by private spectrum administrators, also utilising spectrum licences.

9.0 Authorising Private Spectrum Administrators

FuturePace notes that the Commission is considering the benefits of having large blocks of spectrum managed by private spectrum managers. FuturePace believes this is possible to achieve in a formal manner under existing legislation.

Under the present Act, a space (a spectrum licence) could be defined for management by a single private spectrum administrator who would operate solely through third party authorisation. Or, certain apparatus licensed channels could be privately managed, effectively competing with the ACA in the areas of coordination and licensing. Obviously the first option would provide scope for more certainty for the operation of devices.

There would also be benefits by the private spectrum administrator having a more controlled coordination capacity. It has already been demonstrated that much higher levels of spectrum utility may be obtained when a private

spectrum administrator is allowed sole access to spectrum. For example, the internal ACA arrangement where three 15 GHz point to point channels[4] have been accessed only by Optus since 1993 in both Sydney and Melbourne. In this case, the greater utility has allowed a much greater return to the Australian public through the spectrum access tax for those three channels. It certainly demonstrates that private spectrum administrators have already existed since 1993 and that they have operated more efficiently than the ACA. FuturePace is not aware of whether an additional fee was paid by Optus for this privileged access to spectrum.

9.1 Towards Multiple Services for Multiple Licensees

There would also be benefits in allowing a private administrator to provide the more complex function of multiple service types for multiple licensees. FuturePace has recently assisted companies seeking to ensure that spectrum planning keeps pace with industry requirements. In the past year we have designed coordination rules for the following non-homogeneous services:

- trial operation of mobile trunked services in TV Channel 69 and CT2 allocations; and
- apparatus licensing of DCS-1800 mobile services in fixed point to point allocations.

We expect this type of activity to increase.

10.0 Creating an Effective Industry Based On Spectrum Licensing

It is a fact that the government sought, through the development of spectrum licensing to create a new type of communications service. The ACA's earliest statements referred to the need to allow the development of this 'fledgling industry'. In developing spectrum licensing the ACA has had the opportunity to sponsor innovation at the cutting edge of world telecommunications practice in the development of spectrum licensing. The ACA advised industry

[4] 14.578/15.222 GHz, 14.592/15.236 GHz and 14.606/15.25 GHz

in 1997–98 that they would not develop the technical tools necessary for the detailed management of spectrum licensing and sought a commitment from industry to develop the managerial and coordination tools to enable industry-based management. Companies such as FuturePace have invested heavily in the development of these tools. Any variation to the licensing system would potentially undermine this industry commitment.

Equally, licensees have undertaken considerable effort in the development of in–house expertise and this should be considered as part of the change equation.

The creation of an industry requires at least a basic level of policy and regulatory consistency and 3 years is insufficient development time. It also requires a programmed approach to the release of spectrum so as to ensure that there is phased evolution of the policy and a sufficient body of work to ensure that the fledgling industry has at least some thing to develop as it acquires skills.

Last year the ACA ran 5 auctions, this year it has just released a draft forward program of price based allocations. There needs to be a more coherent policy applied to the release of spectrum.

A planned program of spectrum releases based on a 5 year rolling program would allow industry to plan it's activities and would also signal to other affected industry elements, including accredited persons and financial planners, the direction in which the ACA, in consultation with the industry, saw developments heading.

The incapacity to plan has direct impact both on the development of coordination tools and pricing. FuturePace has tools designed on a modular system which allows us to quickly insert the relevant rules for each spectrum release into our planning and registration applications.

FuturePace supports certainty in licensing and regulatory matters so as to give industry time to grow into the concepts and benefits of spectrum licensing. The ACA recently assembled its accredited people in Canberra to try to generate more competition in the industry, in effect to under cut the position of the three most successful companies, including our own, and announcing a progressive 'simplification' of the process.

As initially predicted by the ACA, the fate of accredited people should be decided in the market place. Newly accredited persons should have no expectation for the existing industry to adjust their skills level downward. This is a classic case of non-industry based operatives impacting on industry by the application of policy bromides such as 'competition' and 'level playing fields' without any real understanding of the structural and financial realities.

11.0 The 2.3 GHz Conversion Plan

The apparatus licensed spectrum of Austar and TARB was converted to 15 year spectrum licenses on expiry of the original five year licences, despite earlier advice to the licensees that renewal should not be assumed. Instead of making this valuable spectrum generally available, spectrum licences were created for the excusive benefit of Austar and TARB who paid in the vicinity of $26 and $44 million. Moreover they did so just prior to the 3.4 GHz spectrum auction which would provide spectrum of similar utility, though equipment availability at 3.4 GHz was less advanced than at 2.3GHz. It is arguable that during that auction, pricing and bidding may have been impacted by the participation of Austar which was apparently at that time, if press reports are to be believed, negotiating to purchase the TARB spectrum for an eventual $140million. This deal was concluded recently. Given the market realities of companies which did purchase at the 3.4 GHz auction for up to $197million compared with what seems to have been a free kick for Austar/TARB, it is surely reasonable to suggest that there is a clear need for more open and external review of ACA practices.

This was valuable spectrum which may have realised a greater profit from auction for the Revenue and which should have been the subject of open competition. Certainly given the availability of equipment at 2.3 GHz any company buying at 3.4 GHz must have looked questioningly at the ACA position and at their own business plan viability. And it is notable that companies which were enthusiastic about market participation at 3.4 GHz have since left the Australian market

The argument was that the 2.3GHz licenses had already been through an auction process and thus prices could be determined by shadow pricing, of course those prices were set under a different auction system and the auction predated spectrum licensing. In addition, the real value of a spectrum licence is determined by it's access conditions and the converted spectrum licences were in effect quite a different product. In the event TARB sold it's 2.3GHz licenses to Austar for a reported $140 million. So much for shadow pricing. The only thing wider than the gap in ACA logic was the smile on the face of TARB once their sale to Austar had gone through. The sting is that this also remains a partially defined spectrum licence.

In mentioning this example FuturePace makes no criticism of any commercial enterprise which takes advantage of a policy rush of blood to the head, we are simply using the matter as illustrative of the need for open review. The howls of outrage from industry were considerable, they were ignored or hosed down with bromides about competition and the level playing field.

12.0 Conclusion

FuturePace has been highly supportive of the oursourcing of the RF certification processes and of much of the technical work under by the ACA. We believe that there is an imperfect understanding within the ACA of both outsourcing and competition issues and certainly some resistance to the full

implementation of the outsourcing policy. As a consequence the ACA has a tendency to revert to its former interventionist and top down regulatory role. These interventions are not particularly productive, as with the 3G access conditions. The ACA has also in the past used its regulatory position to undercut industry in seeking contracts for technical work, as with the registration of AMPS services, this suggests that the ACA may also need to examine closely its application of Government policy on competitive neutrality.

The ACA does not impose the same technical and operational requirements on its operatives as it does on accredited persons, and while we have no difficulty with competing for work on the mythical level playing field, it is hard to compete, as we have sometimes had to do, with free services from the regulator in areas of activity for which we have paid the ACA fees for accreditation and the right to fairly compete within the industry. We believe that if the 'Yellow pages' test can be applied, then the ACA should bow out of the work and leave industry to develop its own processes and tools, and undertake the work. This would include frequency assignment, interference impact certificates and the design of technical rules for spectrum licences.

We should add that in all of this FuturePace has a current contract with the ACA for technical advice in relation to spectrum licensing, including the design of technical frameworks for spectrum licensing. And we have no difficulty in the ACA seeking to apply succession management principles to develop their skills base in relation to spectrum licensing. However, FuturePace does not believe that the ACA 'simplification' approach makes for good public policy especially when they do not yet appear to have a complete grasp of the design elements of spectrum licensing. And, we also believe that there is a need for the ACA not to undertake work which can be performed within industry. Most importantly, the products which are placed in the market should be fully defined and suitable for the purpose for which they are sold, and that to the optimum level of efficiency.

We should be grateful for an opportunity to discuss these matters in more detail at a Productivity Commission hearing.

Michael Whittaker
Director

Barbara Phi
Director

12 October 2001

Submission to Productivity Commission

Attachment A: THE FUTUREPACE SPECTRUM MANAGEMENT SOLUTION