Submission to

The House of Representatives Standing Committee on Communications, Information Technology and the Arts

Inquiry into Wireless Broadband Technologies

New Skies Networks Pty Ltd

ABN 19 078 204 994

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TABLE OF CONTENTS

The Inquiry's Terms of Reference

The Committee has been asked by the Minister for Communications, Information Technology and the Arts, to inquire into and report on the current and potential use of wireless technologies to provide broadband communication services in Australia, including regional Australia, having particular regard to the following:

- The current rollout of wireless broadband technologies in Australia and overseas including wireless LAN (using the 802.11 standard), 3G (eg UMTS, W-CDMA), Bluetooth, LMDS, MMDS, wireless local loop (WLL) and satellite;
- The inter-relationship between the various types of wireless broadband technologies;
- The benefits and limitations on the use of wireless broadband technologies compared with cable and copper based broadband delivery platforms;
- The potential for wireless broadband technologies to provide a 'last mile' broadband solution, particularly in rural and regional areas, and to encourage the development and use of broadband content applications;
- The effect of the telecommunications regulatory regime, including spectrum regulation, on the development and use of wireless broadband technologies, in particular The Radiocommunications Act (1992), The Telecommunications Act (1997), and Parts XIB and XIC of The Trade Practices Act:
- Whether Government should make any changes to the telecommunications regulatory regime to ensure that Australia extracts the maximum economic and social benefits from the use of wireless broadband technologies; and
- Likely, future national and international trends in the development and use of wireless broadband technologies.

1. Introduction

1.1 New Skies Networks Pty Ltd ("**New Skies**") provides this submission to The House of Representatives Standing Committee on Communications, Information Technology and the Arts' (the "**Committee**") Inquiry into Wireless Broadband Technologies (the "**Inquiry**") as its perspective on wireless broadband technologies in Australia and within the Committee's Terms of Reference.

1.2 New Skies is an Australian telecommunications carrier within the meaning of The Telecommunications Act 1997 (Cth) ("**The Act**") and provides satellite-based system design, integration and value-added services to both enterprise and government, nationally and internationally.

1.3 New Skies is 100%-owned by Dutch, global satellite operator New Skies Satellites N.V., based in The Hague, Netherlands.

1.4 Whilst acknowledging that diverse, wireless broadband delivery technologies are available, New Skies' core business focus is the delivery of satellite-based services and consequently its submission herein is provided solely from a satellite technology-related perspective.

2. Definition of "Broadband"

The United States' Federal Communications Commission ("FCC") defines broadband as "…having the capability of supporting, in both the provider-to-consumer (downstream) and the consumer-to-provider (upstream) directions, a speed (bandwidth) in excess of 200 kilobits per second (kbps) in the last mile." According to this definition, many consumer-oriented "broadband" offerings such as ADSL actually fall short of the FCC definition, providing only 128 kbps in the upstream direction. Nevertheless, such offerings must be considered as broadband when conducting a market study and assessment.[1]

Similarly, the Australian Competition and Consumer Commission ("ACCC") defines broadband as "…any high speed connection greater than 200kbits/sec over a mix of media."[2]

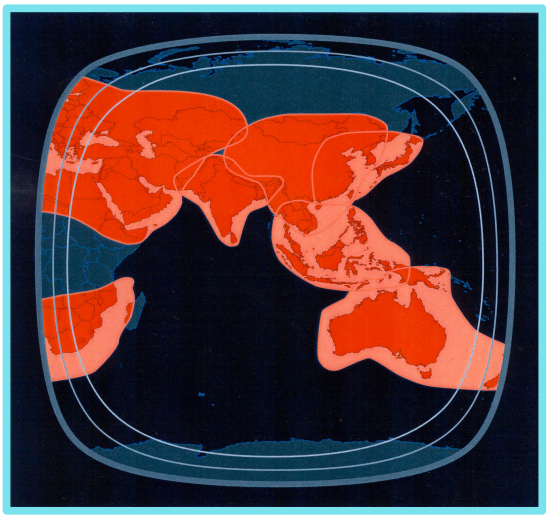
[1] "Broadband Satellite – Analysis of Global Market Opportunities and Innovation Challenges", Pioneer Consulting, January 2002

[2] "Snap Shot of Broadband Deployment as at 31 March 2002", ACCC

3. The current rollout of wireless broadband technologies in Australia and overseas including wireless LAN (using the 802.11 standard), 3G (eg UMTS, W-CDMA), Bluetooth, LMDS, MMDS, wireless local loop (WLL) and satellite

From a space segment perspective, in sheer numbers, Australia is well served by regional geostationary satellites, located in an arc between the central Pacific Ocean in the east to roughly Madagascar in the Indian Ocean in the west. Currently, however, the majority of the higher powered, Ku-band capacity, essential for the delivery of broadband services into acceptably-sized (small) antennas, is either almost fully occupied or the satellite provides a footprint inconsistent with a full national service for Australia. A complete listing of in-orbit and near-term, planned geostationary satellites providing C-, Ku- and Ka-band capacity over Australia (and New Zealand) is provided at Appendix 1 to this submission.

However, New Skies itself is contributing to the development of Australian and regional wireless broadband capabilities with the introduction of its new, broadband satellite, NSS-6, scheduled for launch during Q4 of 2002.



Ku-Band footprint of NSS-6 at 95°E

From its orbital location of 95°E, NSS-6 will not only provide the necessary high-powered Ku-band capacity, customized for the delivery of broadband services, but also simple and straightforward connectivity into and out of Asia, the Indian sub continent and into the Middle East and Africa – an accessible market of around 4 billion people or two thirds of the world's population. This provides the capability and opportunity for all Australians to participate in the global economy, regardless of their geographic location within Australia, and thus effectively contribute to the economic, social and cultural welfare of the nation.

NSS-6 will also feature a commercial Ka-band payload, the first to be brought to Australia which will provide users, at least those within the heavily-populated southeast corner of Australia, with the unique benefits and opportunities afforded by this higher

frequency technology. Further information on NSS-6 is provided at Appendix 2 to this submission.

From the ground segment perspective, the development of broadband delivery platforms which support many thousands of users at data rates equal to or in excess of the accepted 200kbps in both directions, has been slower than expected and has received mixed levels of acceptance from both residential and enterprise users. In the U.S., there are three main Ku-Band, broadband satellite services, Hughes Network System's (HNS) DirecPC (satellite download, telephone upstream) and DirecWay (two-way satellite).

Starband (two-way satellite), a joint venture of Echostar, Gilat and Microsoft, offers always-on Ku-band service with up to 500Kbps/150Kbps downstream/upstream at a suggested retail price of US$70/month, plus US$500 for receiver equipment and US$200 installation.

By December of 2001 there were only 100,000 DirecWay subscribers and 40,000 Starband subscribers, in each case far fewer than the end-of-year targets of 250,000 (DirecWay) and 300,000 (StarBand). Echostar wrote off its Starband investment during the first quarter of 2002, and Starband filed for Chapter 11 bankruptcy protection in June of 2002.[3]

In Australia, 'notional' 2-way, broadband satellite systems have been implemented by both Telstra (Telstra BigPond Broadband 2-Way Satellite) and Optus (SatWeb and SatData). In the case of Telstra's service, this is (or certainly should be) limited to the provision of these services to subscribers within the Extended Zones as the infrastructure required to field these services was acquired as a result of Telstra's awarding of the $150 million Extended Zones tender. However, in both cases, whilst the outroute stream (hub to subscriber) can provide acceptable data rates, the inroute stream (subscriber to hub) still falls short of the accepted definition of broadband. To date, uptake of these services is believed to have been disappointing – mostly due to the cost of the service versus the perceived value by the user.

New Skies, also a value-added service provider, firmly believes in the potential of 2-way satellite broadband within Australia and has intentionally adopted a watching brief on local and international developments of both the technology and market acceptance of these services, resisting the temptation to be an early adopter of these early generation

[3] "Broadband Satellite", Version 3, June 2002, www.pdsconsulting.net

platforms. However, new technologies are now emerging that may, at last, deliver the sought after business model for delivery of a true, 2-way satellite broadband value proposition to its customers as well as generating a commercially acceptable return on investment. New Skies intends to implement these services within Australia and the wider region as and when these commercial and technical parameters are met.

4. The inter-relationship between the various types of wireless broadband technologies

Whilst satellite is perfectly capable of providing efficient and effective, end-to-end broadband services irrespective of geographical considerations, the technology is equally capable of operating in a hybrid environment if the service requirements deem this to be the most technically and commercially viable solution.

A common interplay of wireless technologies, especially in rural and remote environments, is the satellite trunk delivery of broadband content and connectivity to a head end located within a community of interest with the onward "last-mile" distribution and connectivity provided by wireless local loop such as 802.11. These hybrid networks provide, cost-effective and rapidly deployable services for remote communities to which individual users can easily connect at varying data rates and configurations to suit their particular service requirements. Such services can support a wide variety of applications including, PSTN interconnect, data, fax. video and multimedia streaming.

5. The benefits and limitations on the use of wireless broadband technologies compared with cable and copper based broadband delivery platforms

By its very nature, satellite technology possesses a number of unique benefits, which establish it as the mechanism of choice in many circumstances. On the other hand, the technology is acknowledged as susceptible to some unique disadvantages. Both benefits and limitations are detailed below.

Benefits

Ubiquitous Coverage - A single satellite system can reach every potential user across an entire continent regardless of location, particularly in areas with low subscriber density and/or otherwise impossible or difficult to reach. By comparison, land-based operators, such as cable television, cellular and fiber optic telephone companies, can

afford to build or upgrade their networks only in areas with high subscriber concentrations. Moreover, satellite transmission costs are independent of distance within the coverage area of a given satellite system.

Simplicity - Satellite systems bypass the complex web of landline networks, multiple carriers, pricing schemes and billing procedures. Network management of global networks is often more elegant in comparison to terrestrial networks.

Bandwidth Flexibility - Satellite bandwidth can easily be configured to provide capacity to customers in virtually any combination or configuration required in order to meet their needs. This includes simplex and duplex circuits from narrowband to broadband, in both symmetric and asymmetric configurations. Satellite bandwidth can also be apportioned on a time-scheduled basis for those customers with intermittent communication needs.

Rapid Deployment - Satellites can initiate service to an entire continent immediately after deployment, with short installation times for customer premise equipment. This "instant infrastructure" enables satellite providers to seize markets for new services before land-based competitors can construct or upgrade their networks.

Reliability - Satellites are amongst the most reliable of all communication technologies, with the exception of advanced fiber optic ring networks employing SONET (or equivalent) fault tolerant designs. Once placed into orbit, satellite failures are extremely rare.

Limitations

Security - As signals are broadcast, satellites can possibly be susceptible to "eaves-dropping" by unauthorised parties. However, this situation can, in most cases, be overcome through the implementation of a variety of commercial available encryption and subscriber management techniques.

Bandwidth - Satellites generally fall behind terrestrial networks with respect to the amount of system capacity they can provide. Whereas most GEO spacecraft have anywhere between 1 and 5 Gbps of usable throughput, a single fiber optic cable can carry over 1 Tbps (using multiple strands). Additionally, total satellite capacity is also constrained by a finite number of orbital slots that are available for GEO satellites operating in each frequency band. C- and Ku-band slots are essentially exhausted.

Latency - The distance a signal must travel into space and back (approx 250mS for a satellite in geostationary orbit) increases the latency between the sender and receiver,

which could adversely affect the performance of services such as telephony or time-sensitive data applications. Nevertheless, there is continuing development of "spoofing" and related techniques, which largely negates the effects of latency for a user-experience standpoint. It can now be quite difficult to differentiate between voice services over satellite and those carried on a fibre optic cable.

Signal Quality - Satellite transmission can be subject to interference from rain and fog, as well as interference from terrestrial microwave systems operating in the same or adjacent frequency bands. Interference can reduce the signal quality resulting in an additional power requirement, increased bit error rate, or loss of carrier signal.[4]

6. The potential for wireless broadband technologies to provide a 'last mile' broadband solution, particularly in rural and regional areas, and to encourage the development and use of broadband content applications

Satellite is capable of providing both the "last mile" and a "whole mile" solution irrespective of geographical imperatives and in either a point-to-point or point-to-multipoint service configuration.

In a "whole mile" scenario, especially for point-to-point services, the cost-effectiveness of delivering a satellite-based service compared to a terrestrial alternative becomes relevant. In urbanised areas exhibiting mature terrestrial networks, satellite is generally non-competitive. However, for point-to-multipoint services such as content distribution, streaming multimedia etc, even in an urban environment and having fibre and other wireless technologies available, satellite delivery is unchallenged for its cost-effectiveness.

> "On the other hand, where satellite technology really shines, according to Regard, is in broadband multicasting. Satellite networks can stream or deliver content at up to 45 Mbps to millions of users with no degradation in speed. This makes satellite communications ideal for e-learning, video communications, content distribution, or high-quality entertainment. This is an area where terrestrial networks cannot come close to competing with satellite, Regard says."[5]

[4] "Broadband Satellite – Analysis of Global Market Opportunities and Innovation Challenges", Pioneer Consulting, January 2002

[5] "Broadband in the Sky", Eric Knorr, October 2001, www.business.cisco.com

7. The effect of the telecommunications regulatory regime, including spectrum regulation, on the development and use of wireless broadband technologies, in particular The Radiocommunications Act (1992), The Telecommunications Act (1997) and Parts XIB and XIC of The Trade Practices Act

Regulating the use of spectrum in Australia is a sensible and necessary action, however the government must, at all times, be aware of the growing demand for spectrum and be prepared to find innovative methods of releasing new blocks of spectrum or in sharing and reusing current spectrum allocations.

Spectrum auctions, as conducted in most countries, offer an opportunity to purchase spectrum at what should be market dictated prices. This is not always the case. In the past speculators have not only created inflated prices for this spectrum but have then 'sat' on the spectrum they have acquired and in the process stifled potential growth in a number of areas. The government must be mindful of this type of 'cowboy' attitude and take the appropriate steps to ensure that a fair and equitable sharing of the spectrum occurs and that it is done at a cost level that allows smaller enterprises to create innovate uses for this spectrum.

Whether some telecommunications operators like or dislike the fact, a degree of regulation in the industry, particularly relating to spectrum management, is necessary. What is important is that the regime remains transparent, has the ability to accommodate complaints and objections, offer on-going consultation with industry and maintain a 'light touch' approach to regulation of the industry.

New Skies, having had exposure to most regimes around Asia, finds the Australian model to be one of the better examples of a workable regulatory regime. If one were to offer up any criticism it would be that the cost recovery methods are, whilst reasonable, based in the most part on time spent by the ACA staff working on certain projects and not on a fixed cost. This allows for too much guesswork on the part of the operators when creating a costing model.

8. Whether Government should make any changes to the telecommunications regulatory regime to ensure that Australia extracts the maximum economic and social benefits from the use of wireless broadband technologies

In order for the wireless and satellite based industries to grow to their full potential, New Skies feels the government needs to adopt and guarantee a technology neutral approach to the regulatory environment and one that encourages and nurtures both competition and technological innovation.

It may also be advisable for the government to consider the establishment of a specialist broadband department under the auspices of the Australian Communications Authority that has regular contact with commercial operators and industry support groups, such as SPAN and ATUG.

We also feel that government must consider the option of subsidies for businesses – both urban and rural - and rural residential consumers to encourage them to trial a broadband service, on either a satellite or terrestrial wireless network.

9. Likely, future national and international trends in the development and use of wireless broadband technologies

Given the very nature of Australia's combined topography and demography, the general trend of wireless broadband usage can only be upward. Details of predicted usage of broadband services, in general, within Asia are provided at Appendix 3 to this submission. However, this rate of upward increase, particularly in Australia, will largely be dictated by the ability of service providers to engineer suitable business models that provide the desired customer value proposition (nature and quality of service at a price point that is perceived as being value for money) as well as present as being commercially pragmatic for service provider themselves.

New Skies feels that two of the major reasons for current slow uptake of wireless broadband services are the lack of critical mass of potential users within the Australian market coupled with the high costs of importation associated with a country lacking an indigenous manufacturing industry. The current cost of consumer equipment (CPE), necessary to provide such wireless services, is relatively high in Australia when compared to similar markets such as those within the G7 and ASEAN communities where in-

country manufacturing exists. This is certainly true of satellite-based, equipment, such as 2-way DVB-RCS units.

New Skies would applaud and encourage consideration of government initiatives to create an indigenous, wireless broadband-related manufacturing industry which would enable the provision of high quality but lower cost consumer premises equipment (CPE) and thus further facilitate the general uptake of wireless broadband activity.

From a pure ground segment technology perspective, New Skies envisages more widespread and committed adoption of international standards for 2-way satellite broadband, such as DVB-RCS, that will further improve systems interoperability and hardware manufacturer's economies of scale - thus driving down infrastructure and CPE costs and providing a further impetus to the uptake of wireless broadband.

International Examples

In countries such as the USA or Korea where there is a much greater critical mass, a consequent larger take-up of broadband access and a domestic manufacturing industry, such items have been falling substantially in price and are now making access to wireless-based, broadband technology more affordable to the consumer.

In the UK where British Telecom ("**BT**") recently rolled-out a broadband via satellite network, business users were encouraged to trial the service through an £800 subsidy from a London council. Such a subsidy would go a long way to covering the initial set-up costs involved in broadband take-up for an SME, for example, and we feel a similar approach should be considered by the Australian government to encourage broadband take-up in the Australian business community.

10. Summary

In completing and closing this submission to the Inquiry, New Skies would again highlight the key points we feel the Committee and the Government need to address, being:

- A technology neutral approach to (wireless) broadband roll-out
- Acceptance of satellite technology as an integral part of providing cost effective and timely national broadband connectivity

- That the regulatory regime remains transparent, has the ability to accommodate complaints and objections, offer on-going consultation with industry and maintain a 'light touch' approach to regulation of the industry.
- On-going dialogue with commercial satellite operators on issues related to developing technology, knowledge, sectoral educational and awareness initiatives
- Appropriate government initiatives and policy to support and encourage wireless broadband take-up through local manufacture of CPE
- Encouragement for commercial and government enterprises to design and market compelling content for broadband users

APPENDIX 1

GEOSTATIONARY SATELLITES PROVIDING

CAPACITY OVER AUSTRALIA & NEW ZEALAND

Geostationary Satellites Providing Capacity over Australia and New Zealand

Satellite	Orbital Slot	Australian Coverage			NZ Coverage			Comments
		C	Ku	Ka	C	Ku	Ka	
NSS 513	183°E	✓			✓			
Intelsat 701	180°E	✓	✓		✓			
Intelsat 603	178°E	✓	✓		✓			In service from 2003
Intelsat 702	176°E	✓	✓		✓			
Intelsat 802	174°E	✓			✓			
AMC 13	172°E	✓						Launching 2003
PAS 2	169°E	✓	✓		✓	✓		
PAS 8	166°E	✓	✓		✓			
Superbird B2	162°E		✓					Ku steerable beam available to Australia
Optus B1	160°E		✓			✓		
Superbird 6	158°E			✓			✓	Launching 2003. Ka steerable available to Aus/NZ
Intelsat 604	157°E	✓						Relocating from 105.5°E. In service 2002
Intelsat 705	157°E	✓			✓			In service from 2003
Optus B3	156°E		✓			✓		
Optus C1	156°E		✓			✓		In service from 2003
JCSAT 2A	154°E	✓			✓			
Measat 2	148°E	✓	✓		✓			Ku over eastern Australia only
Superbird C	144°E		✓			✓		Ku steerable beam available to Aus/NZ
Apstar V	138°E	✓	✓		✓			Launching Feb 2003
JCSAT 3	128°E		✓			✓		
Asiasat 4	122°E	✓	✓		✓	✓		Launching late 2002
IPSTAR	120°E		✓			✓		Launching 2003/04
Koreasat 3	116°E		✓					
Palapa C2	113°E	✓			✓			
Telkom 1	108°E	✓						Northern Australia only
Asiasat 3S	105.5°E	✓	✓		✓	✓		Ku over NZ south island only
Asiasat 2	100.5°E	✓						
NSS 6	95°E		✓	✓				Launching November 2002
Measat 1	91.5°E	✓						Northern Australia only
Measat 3	91.5°E	✓						Launching 2004
Intelsat APR1	83°E	✓						Intelsat leased capacity on Insat 2E
Insat 2E	83°E	✓						Western Australia only
Thaicom 3	78.5°E	✓						
Apstar IIR	76.5°E	✓						
LMI 1	75°E	✓						
PAS 4	72°E	✓						Northern Australia only
PAS 7	68.5°E	✓						Northern Australia only
PAS 10	68.5°E	✓						
Intelsat 704	66°E	✓						Western Australia only
Intelsat 804	64°E	✓						Western Australia only
Intelsat 602	64°E	✓						Western Australia only
Intelsat 902	62°E	✓						Western Australia only
Intelsat 904	60°E	✓						Western Australia only
NSS 703	57°E	✓						Western Australia only

New Skies' Satellites

APPENDIX 2

NEW SKIES SATELLITES'

NSS-6 AT 95°E

NSS 6

Orbital Location
95° East

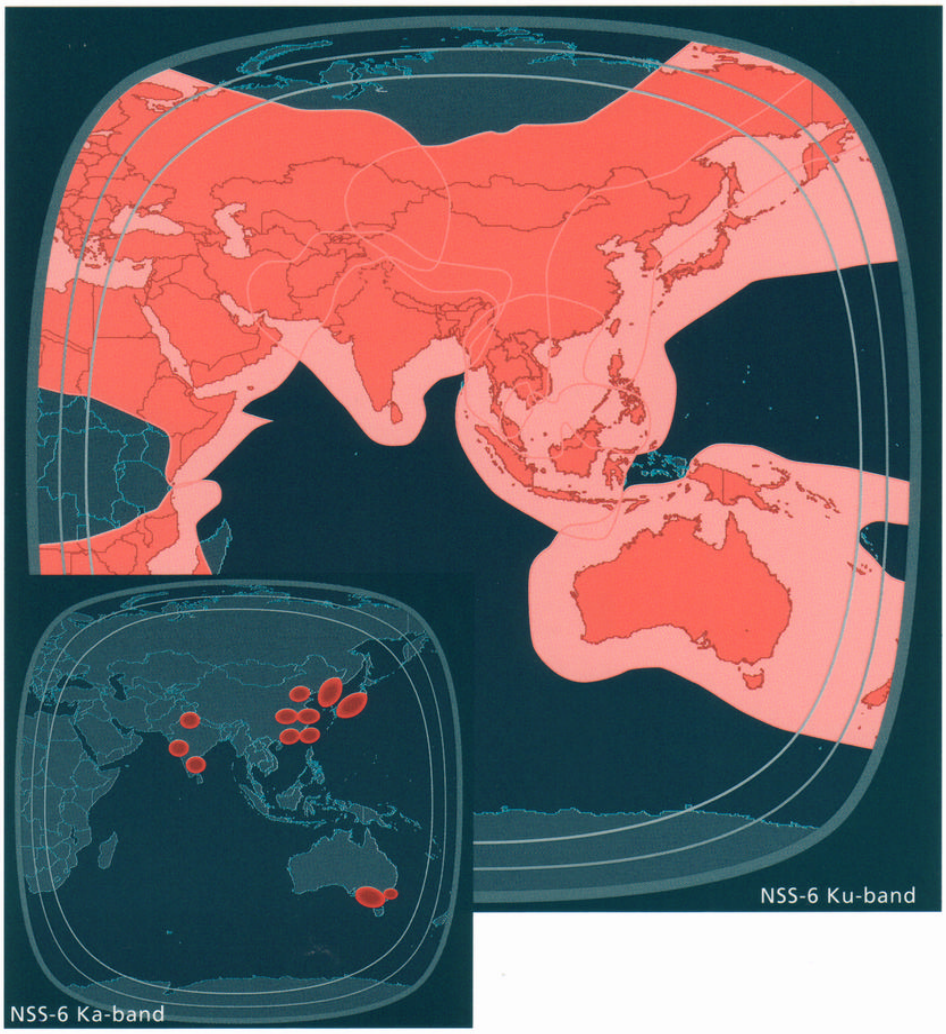
Transponders
(36Mhz equiv)
50 Ku-band
12 Ka-band

Anticipated Launch
Q3 2002

Estimated End of Life
January 2016

Type
Lockheed Martin
A2100 AX

NEWskies SATELLITES



New broadband multimedia satellite for Asia

From 95° East you can get a great view of the world! Reach markets from the Mediterranean Sea to Japan from a single orbital position, taking in the whole of Asia, Australia, Southern Africa and the Middle East.

NSS-6 covers all the major content hubs and broadband centers in the region allowing the networking of TV channels and broadband media content throughout Asia.

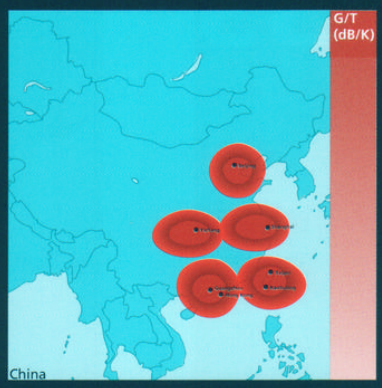
With 6 high performance Ku-band beams, NSS-6 covers the whole of Asia and can deliver broadband media to small business, ISP to domestic rooftop antennas in every market. The satellite delivers DTH power and performance, as well as the best inter-regional connectivity in the satellite industry.

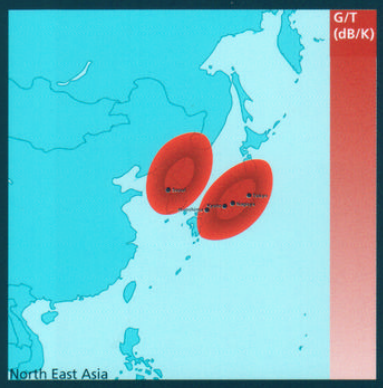
Unique in the region - 12 Ka-band spot beams serve the major media, content and communications cities of the Asia Pacific region, enabling two way interactive broadband services.

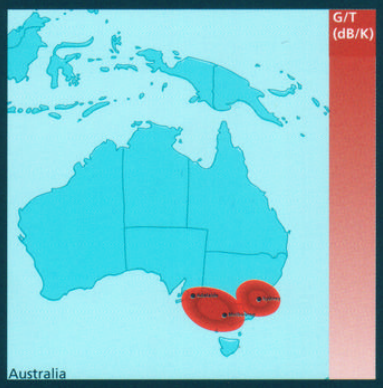
From local uplink at Ka-band to regional coverage at Ku-band to global connectivity, NSS-6 is the ideal satellite for ambitious communicators.

NSS 6

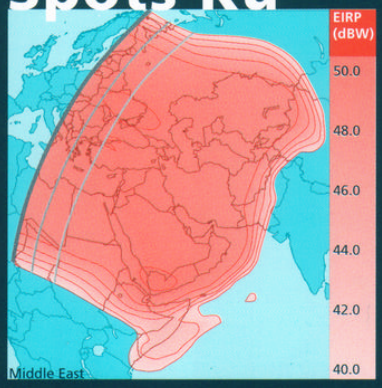
Spots Ka

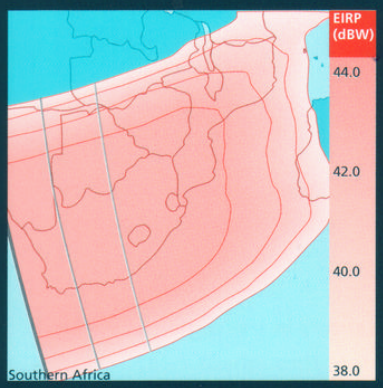


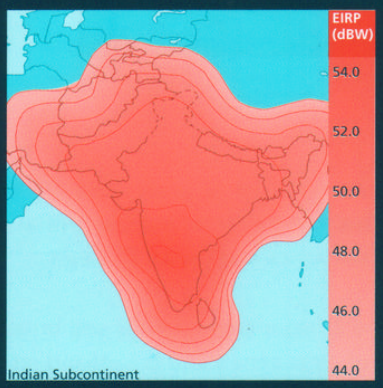


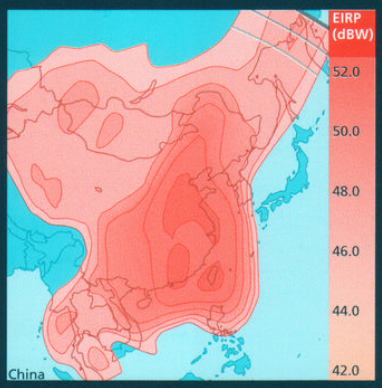


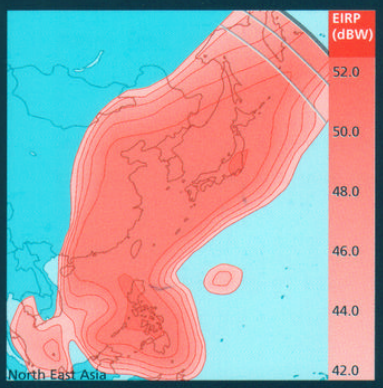
Spots Ku

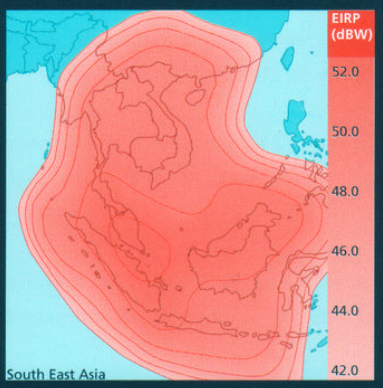


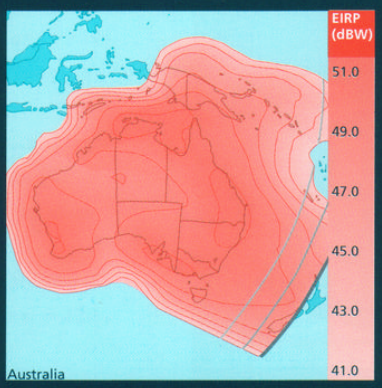










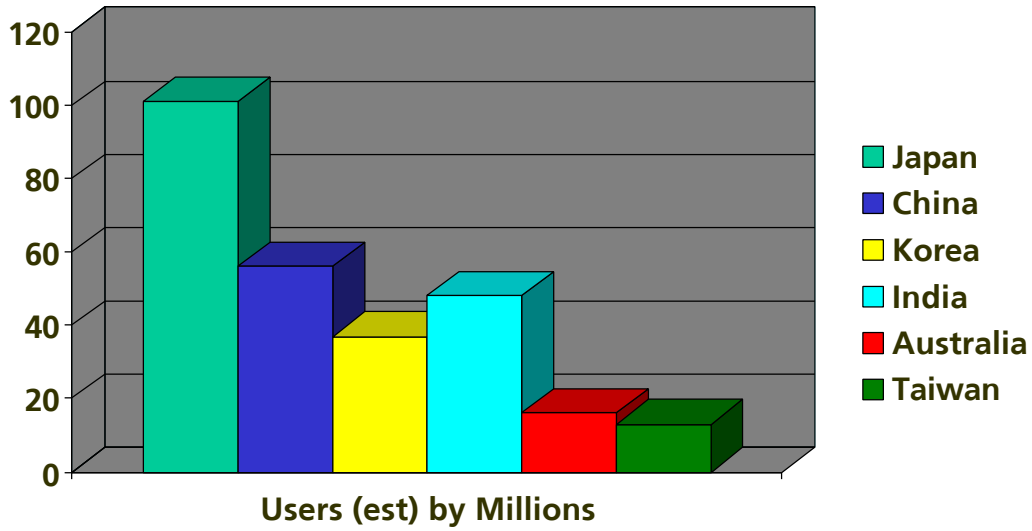


Technical specifications are subject to change and are for general guidance only. For specific technical advice contact your nearest New Skies office.

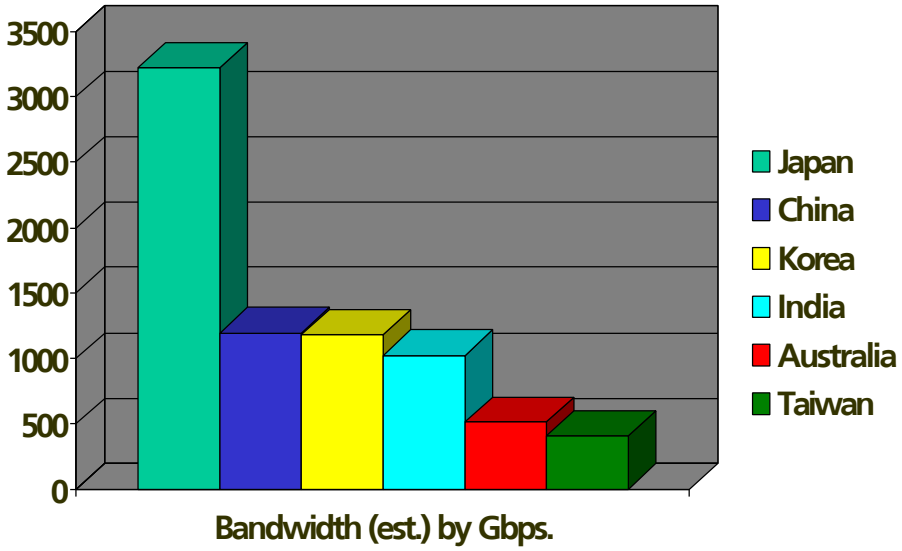
APPENDIX 3

PREDICTED BROADBAND USAGE IN ASIA BY 2005

Predictions for Broadband bandwidth usage in Asia Pacific by 2005 – Top 6 regional economies



Source – Pioneer Consulting, Broadband Satellite Report, January 2002.



Source – Pioneer Consulting, Broadband Satellite Report, January 2002.