



**SATELLITE**

**Submission to DCITA in Response to  
Discussion Paper**

**"Digital Conversion of Self-Help  
Television Transmission Sites"**

**24 August 2007**

# 1 TABLE OF CONTENTS

<b>1</b>	<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>2</b>	<b>INTRODUCTION.....</b>	<b>3</b>
<b>3</b>	<b>DIGITAL TELEVISION? .....</b>	<b>5</b>
<b>4</b>	<b>THE CHALLENGES .....</b>	<b>6</b>
4.1	The Distribution Challenge .....	6
4.2	The Spectrum Challenge.....	7
<b>5</b>	<b>USEFUL TECHNOLOGY ADVANCES .....</b>	<b>8</b>
5.1	New Satellite Transmission technology .....	8
5.2	New Compression technology.....	8
5.3	The Optus D series Satellites .....	8
5.4	New Consumer Set Top Box Technology .....	9
<b>6</b>	<b>EXISTING AND FUTURE SATELLITE PLATFORMS .....</b>	<b>10</b>
6.1	Satellite Technology.....	10
6.2	Aurora Platform .....	10
6.3	Enhanced Aurora Platform .....	11
6.4	Digital Television Distribution Platform .....	11
6.5	New Digital Television Distribution Platform.....	12
6.6	Cost Effectiveness .....	12
<b>7</b>	<b>ISSUES RAISED BY THE DISCUSSION PAPER.....</b>	<b>13</b>
7.1	Issue 1 .....	14
7.2	Issue 2 .....	15
7.3	Issue 3 .....	17

## 2 INTRODUCTION

Optus welcomes the opportunity to provide comments on the issues raised by the discussion paper on the conversion of self-help retransmission sites.

This submission by Optus Satellite draws from many years of providing broadcast services by satellite, both digital and analogue forms.

It is welcomed that the Australian Government is committed to ensuring that all Australians, irrespective of where they live, will be able to enjoy the benefits of digital television.

Ideally, this digital television would be of an equal standard in the number of channels and technical quality wherever Australians live.

However, this must be tempered by the policies to cease analogue terrestrial TV transmissions while also ensuring people do not lose reception of existing free to air television services.

Optus believes there is substantial merit in dealing with the issues on an integrated Australia-wide basis rather than through fragmented remote area Part B Digital Conversion Scheme forums or self-help transmission site digital conversion forums.

Further, Optus is of the view that to determine the best means of satisfying conversion of self-help sites to digital television, consideration must also be given to the associated signal distribution demands to the sites to be able to assess the full impact of a particular approach.

Clearly, satellite is a feasible means of delivery and by application of state of the art satellite technology, the size of the distribution challenge can be reduced to a reasonable cost.

For nearly a decade, Optus has operated a satellite-based digital broadcast platform called Optus Aurora that offers a suite of satellite products and services. The Aurora platform enables the live broadcast of video, audio and data throughout Australia. Broadcasting on the Optus C1 satellite, Optus Aurora services are delivered to both analogue terrestrial transmitter sites and Direct-To-Home (DTH) users all over Australia.

The Optus Aurora system has provided, and continues to provide, a valuable and important service especially for television and radio audiences, including those in "black spots", in regional and remote Australia.

Optus has also provided carriage by satellite for over 6 years now, of digital streams to feed digital television transmitters directly. Aimed at relatively large receive dishes, these services are not considered capable of DTH reception.

When the Optus D3 satellite is launched in 2009, it will be placed in the 156°E slot and be co-located with the Optus C1 satellite. With D3 in service, the available capacity for the Aurora platform expansion and Digital Television distribution will be greatly increased.

Optus believes there is an extended role for satellite technology in delivering free-to-air digital television services to enable digital conversion to occur in remote areas and to enable analogue terrestrial television switch-off to occur as early as possible in the regional and metropolitan TV markets.

Addressing the need for the conversion of self help sites broadens the scope of the recent, more confined attempts, by Optus to develop products, services and options for just the remote areas.

Optus is prepared to work with Government, all broadcasters, Broadcast Australia and other stakeholders to achieve a satisfactory outcome.

Optus wishes to add that several technical discussions have been held with the RABS re possible future means of delivering digital television by satellite. A solution has not yet been finalized and this leaves the door open to incorporate the needs of the self help sites into an integrated Australia-wide approach as mentioned above.

### 3 DIGITAL TELEVISION?

Optus believes that the term “digital television” and the extent to which all Australians, irrespective of where they live, will be able to enjoy the benefits of “digital television” means different things to different people and the Government needs to be very clear on its position.

The Discussion Paper does not address the nature of the Digital Television service achieved through each of the different options presented.

Of the two broad approaches of the Discussion Paper to retransmission, there is a significantly higher level of Digital TV service to the consumer when individual digital transmitters are installed for each television service to be retransmitted in digital mode at a site.

For each broadcast service, individual transmitters could support offerings of free-to-air digital programs in Standard Definition (SD), High Definition (HD) where appropriate, superior sound (including some programs in surround sound), Widescreen (typically 16:9) pictures and extra channels.

The overall costs of such an arrangement would be quite high particularly when expanded to include the high numbers of regional television channels and when distribution feed costs are taken into account.

The other broad option for retransmission which requires installation of multiplexing equipment would replace existing analogue services with a digital stream carrying the digital SD channel equivalents. This would significantly reduce costs but also delivers an inferior level of service to the consumer.

## 4 THE CHALLENGES

### 4.1 The Distribution Challenge

One Analogue TV channel is transmitted in the VHF/UHF spectrum within one 7MHz channel. A typical line-up of 5 TV channels serving an area (ABC, SBS and three commercial channels) requires 5 such 7 MHz slots in the available spectrum.

One Digital TV service provided by one Broadcaster is typically a digital stream compliant with the Australian standard having a transmission rate between 19.35 Mbit/s and 23.05 Mbit/s. This stream carries compressed TV channels and has the capability to carry one HD channel plus 2 or more SD channels and ancillary services. This digital stream is transmitted terrestrially also in one 7 MHz channel of the VHF/UHF band. A line-up of 5 such streams requires five 7 MHz slots.

Thus in re-transmission, one analogue channel and one digital television stream requires the same amount of VHF/UHF spectrum capacity in principle (ignoring possible complexities of coverage differences and fill-in needs).

When one compares the distribution capacity required to deliver an analogue or a digital stream to a retransmission site or DTH, a very different comparison between the demands of analogue and digital TV emerges.

Regardless of the transmission system employed for distribution (fibre, microwave or satellite), digital transmission technology is employed. An analogue TV channel typically allows compression using MPEG 2 encoding at around 4 Mbit/s without significant loss of quality. The digital TV stream, on the other hand, is already compressed and must be carried at its actual rate of circa 20 Mbit/s.

It follows that the distribution of a digital TV stream requires approximately a fivefold increase in transmission capacity compared to analogue TV and therein lays the distribution challenge. The cost of distribution by satellite is roughly proportional to capacity and is thus of the order of fivefold higher.

Consequently, a compromise is necessary, either in the number of individual digital services available to a given self-help or black-spot site (thus increasing the number of out-of-area services) or the reduction of what constitutes an individual digital broadcast service e.g. the equivalent line up of SD channels.

For the purpose of shutting down analogue transmitters within a reasonably short time, assuming this is a key driver, the latter would be preferable. In our view, with this channel line up, the consumer would have little incentive to purchase a digital set-top box and the Government may need to consider a subsidy to boost the set-top box uptake.

## 4.2 The Spectrum Challenge

With the possibility of a large number of self help sites and underserved areas within licence areas (black spots), there may be an unacceptably high demand for VHF/UHF spectrum utilization to support retransmission.

Increasing the use of DTH wherever practicable will reduce the demand for scarce spectrum.

## 5 USEFUL TECHNOLOGY ADVANCES

### 5.1 New Satellite Transmission technology

There are potential advantages to be gained from utilizing a relatively new cutting-edge satellite transmission standard DVB-S2, rather than the long established DVB-S.

DVB-S2 offers improvement in the efficiency of a satellite transponder by about 30 percent without impacting receive dish sizes. The capacity of a standard 36 MHz satellite transponder, operating with 30.0 mega symbols per second and FEC of 3/4, may increase from 40.5 Mbit/s to about 52 Mb/s using DVB-S2.

### 5.2 New Compression technology

There are also potential advantages to be gained from an alternative to MPEG-2, the long established DVB video encoding standard, with a system that allows greater compression and thus have the potential to reduce the capacity required to support SD and HD transmissions. The MPEG-4 Part 10 encoding, also known as Advanced Video Coding (AVC) or ITU-T Rec. H.264 appears to be the leading contender at this time.

The MPEG-4 Part 10 standard is reported to deliver bit-rate savings up to as much as 50% over MPEG-2.

Optus has little expertise to contribute to a debate as to the feasibility and benefits (or otherwise) of introducing MPEG-4 to mainstream digital terrestrial television. That is a matter for the Government and the Broadcast community.

However, Optus believes that for DTH reception in regional and remote areas, MPEG-4 should be given serious considerations as a complementary alternative to MPEG-2 as the potential cost savings are very significant. Once established, MPEG-4 could possibly grow to the major role on the platform over time.

### 5.3 The Optus D series Satellites

On 14 October 2006, Optus successfully launched and deployed the first of our high powered D-Series satellites, Optus D1. These high powered satellites offer, among other things, an increase in throughput efficiency through increased transmitted power.

This D1 satellite is the first of the Optus "Three Satellite Strategy" which includes a D2 satellite to operate at 152°E (to replace the present Optus B3). And a third satellite, Optus D3, to operate at the 156°E orbital slot and be co-located with the existing Optus C1 satellite.

The Three Satellite Strategy has been given full Board approval and is now well underway. D2 is planned to be launched by the end of calendar 2007 and D3 in the first half of 2009.

It is not planned to transition the Aurora platform to D3, but the co-location of D3 with C1 at 156°E provides a number of options for consideration.

It should be noted that D1 and D2 are essentially replacement satellites while D3 is a growth satellite, which by co-location with C1 at 156°E will greatly extend the capacity available at that orbital slot and across the Optus fleet.

Optus proposes that the Optus D3 satellite, which is expected to be available by the third quarter 2009, and the existing C1 satellite can together satisfy the satellite distribution requirements. The D3 timeframe is consistent with the analogue turn-off schedule and in addition, allows time for new technologies such as MPEG-4 to mature and its impact to be fully assessed by the industry.

## **5.4 New Consumer Set Top Box Technology**

Satellite consumer set top box (STB) technology has for many years been based on DVB-S and MPEG-2 technology. STBs are now available with new technology based on DVB-S2 (in the broadcast mode) and MPEG-4. Typically there is a dual capability: DVB-S and S2, and MPEG-2 and MPEG-4 in the same unit. On our initial discussions with manufacturers, there is a view that because of the available chipsets, MPEG-4 (also with MPEG-2 capability) will become the norm within a year or so and without any cost penalty on the consumer STB. The situation with DVB-S2 is not as clear cut and the view is that incorporation of DVB-S2 into the STB along with DVB-S is expected to incur a small cost penalty for at least the next few years.

## 6 EXISTING AND FUTURE SATELLITE PLATFORMS

### 6.1 Satellite Technology

Satellite is clearly an important means for flexible services to aid reception by many small and dispersed communities, and where distance and/or topography may limit the effective range of transmitters.

Regrading the two basic options raised by the Discussion Paper:

1. Establish self-help retransmission facilities
  2. Establish Direct to Home reception,
- both can be fed by satellite.

Comparing the costs to consumers of the home installation in converting from analogue terrestrial TV to either DTTB or DTH, industry experience would indicate that these costs can well be similar in magnitude. The existing VHF/UHF antenna system in the home is likely to require an upgrade to successfully receive DTTB. This is due to the lack of screening on old cable installations and/or the poor performance in terms of screening and frequency response of older antennae at new frequencies allocated for DTTB. Where this is the case, the cost of a DTTB STB, antenna and down lead plus the installation by qualified installers will be similar to an equivalent DTH installation.

A range of implementations are available, drawing on current platforms and available technologies. This will allow any broadcaster to choose a solution to meet its own needs.

### 6.2 Aurora Platform

The Aurora platform is a digital transmission system, which delivers FTA (free-to-air) TV, and radio services throughout Australia and New Zealand. The Aurora platform is DVB compliant, employs MPEG-2 compression and is designed to provide DTH performance, with receive antennae typically being 1 metre or less in diameter (a significant number of RABS consumers may have an antenna around 1.5 m held over from pre-Aurora technology). Aurora operates across several satellite transponders and although the great majority of TV and audio programs are essentially FTA, a conditional-access system is used to encrypt the service to restrict access according to a viewer's geographical location. A smartcard and STB is required to receive and decrypt the services.

The Optus Aurora platform was originally designed for a DTH service (ie. achieves satisfactory performance into a small, low cost antenna). The number of DTH viewer sites in Australia fed from the RABS services on the C1 satellite now exceeds 74,000 and is expected to reach over 80,000 before the end of 2007. There are also over 10,000 business TV subscribers.

At this time, there are 13 RABS television channels on the satellite (ABC 5, SBS 4, Seven Central 1, Imparja 1, WIN 1, GWN 1) and viewers in remote areas are able to receive, as a minimum, one ABC television channel and one SBS channel plus two commercial television channels (as a function of viewer location) all via satellite. There are also a number of other television services including business TV applications and over 60 audio services.

With the planned arrival of the D3 satellite Aurora can be expanded as necessary to add identified regional television channels to the present RABS line up for serving self-help sites.

### **6.3 Enhanced Aurora Platform**

There are several means available to enhance the Aurora Platform: addition of regional television channels to serve self-help sites and black spots (probably widescreen versions); conversion of existing RABS channels (4:3 aspect ratio) to widescreen; introduction of DVB-S2 transmission; introduction of MPEG-4 compression.

Key to the success of these enhancements is the consumer STB. A new class of STB will be available from vendors in our timeframe to handle all of these enhancements or any selected subset of them.

If pursuing the conversion of existing channels to wide screen versions, then the capability of the existing STBs will also have to be carefully examined. Optus proposes that it work with all stakeholders to achieve as smooth a conversion as practicable in this case.

### **6.4 Digital Television Distribution Platform**

This system, which has been in operation for over 6 years, was designed for reception by large antennae (typically 3.7m to 4.5m in diameter) which would commonly be used at digital television transmission sites. DTH reception is not practicable with this design as the receive antenna is considered too large for a satisfactory DTH service. Typically, the acceptable antenna size for DTH operation is less than 1m and up to 1.5 m in remote areas.

The DTTB distribution platform utilises DVB-S modulation techniques (ETSI standard EN 300 421) to carry the DVB-T transport stream. That is, the MPEG-2 transport stream which is passed directly through to the DTTB transmitter contains a NIT (Network Information Table) that is designed to be received by a digital terrestrial STB in a terrestrial network as per the Australian standard AS 4599. The transport stream rates are 19.35 Mbps; 21.77 Mbps or 23.05Mbps as set by the broadcaster. The DTTB streams are uplinked at an Optus satellite facility.

## 6.5 New Digital Television Distribution Platform

The main thrust for a new distribution platform is to provide more cost-effective digital television satellite distribution. The availability of higher powered D-series satellites together with the new DVB-S2 transmission technology presents an opportunity to achieve this.

The proposed new DTTB distribution platform will utilise DVB-S2 higher-order modulation techniques (ETSI standard EN 302 307) to carry the DVB-T transport stream. Again, the MPEG-2 transport stream would contain a NIT (network information table) that is designed to be received by a digital terrestrial STB in a terrestrial network as per the Australian standard AS 4599. The DTTB streams will be uplinked at an Optus satellite facility.

## 6.6 Cost Effectiveness

The way relevant broadcasters implement the Part A and Part B Digital Conversion Schemes, will have a significant effect on what can cost-effectively be achieved in converting current analogue terrestrial free-to-air television sites to digital. In particular this will depend on how the broadcasters distribute program streams to their digital terrestrial transmitters and update the way they make their services available to the existing remote area, or so called 'out of area' DTH audience.

Optus would welcome the opportunity to work with all stakeholders to develop a cost-effective solution to suit everyone. We have outlined in this submission a number of approaches involving technology advances and existing and planned platforms which can be drawn upon to offer increased services to self-help sites and RABS consumers.

## 7 ISSUES RAISED BY THE DISCUSSION PAPER

The 650 analogue terrestrial television sites occur in all areas of Australia. Around 30% are in metropolitan and regional areas and 70% in remote areas (including regional WA). In the regional and metropolitan areas, the primary method of delivering program services to the self-help transmitters is 'off air' from existing analogue television transmissions. In remote areas, the self-help analogue transmitters are generally fed by satellite.

Previously, free-to-air broadcasters have not wished to have any formal link to self-help transmitters, particularly in the metropolitan and regional markets. However, this has not been the case at the only two digital terrestrial television self-help sites rolled out so far, at Port Stephens and Springbrook. Given the more complex operational digital environment, particularly where off air feeds from broadcaster-owned digital terrestrial sites or single frequency networks are involved, Optus understands that the broadcasters determined to hold the required licences for the facilities at these sites. This is practical evidence of how operational arrangements and degrees of broadcaster involvement may change when the existing analogue television terrestrial self-help transmission sites convert to the more complex digital environment.

As mentioned, the way relevant broadcasters implement the Part A and Part B Digital Conversion Schemes, will have a significant effect on what can cost-effectively be achieved in converting current analogue terrestrial free-to-air television sites to digital. In particular this will depend on how the broadcasters distribute program streams to their digital terrestrial transmitters and update the way they make their services available to the existing remote area, or so called 'out of area' DTH audience.

For example, the ABC distributes its digital terrestrial program services by satellite to nearly all its digital terrestrial television sites. On the other hand, regional commercial TV distribution in the aggregated markets is almost entirely terrestrial.

Currently, in the remote areas, all relevant broadcasters use the one satellite platform to feed their own and self-help analogue transmitters and make their services available to the remote and out of area DTH audience.

The interrelationship between the way Part A and Part B Digital Conversion Schemes are being implemented and optimal options for converting existing self-help free-to-air analogue retransmission sites to digital is underlined by the discussion paper suggestion that perhaps it would be more practical and cost effective for self-help sites servicing less than 500 people (or around 180 TV homes) to convert to DTH.

This would clearly increase the current DTH audience in Australia for free-to-air services by a significant amount. According to the DCITA figures, some 375 remote area and regional Western Australian self-help sites serve less than 500 people and 80 in the remaining regional areas and in the metropolitan markets do as well. Hence, if the 500 population or 180 TV home figures became the financial assistance cut-off point, some 70% of current self-help analogue terrestrial retransmission sites could disappear with the audiences they cover converting to DTH. This would probably triple the free-to-air DTH audience in Australia.

However, it is logical that any small self-help terrestrial communities in the current regional areas (outside of Western Australia) and the metropolitan markets would only find DTH acceptable if there was a reasonable match between what was available from the satellite and the number and the state of origin of the analogue free-to-air services they currently receive through normal domestic terrestrial aerials.

The point being made is that converting the current analogue terrestrial self-help sites is not something that should be done in isolation from implementing the Part A and Part B Digital Conversion Schemes. If increased deployment of DTH is involved in the regional and metropolitan areas, whether to assist conversion of existing small self-help communities or provide back up to any new digital terrestrial reception black spot communities or homes that develop, then it is unlikely that the current out of area free-to-air DTH services available from remote commercial television broadcasters would be sufficient.

## 7.1 Issue 1

**“Whether the use of individual digital transmitters for each service or the use of multiplexers, would be the most effective option for converting existing analogue self-help retransmission sites to digital in relation to:**

- **Technical viability;**
- **Costs of conversion, operation and maintenance; and**
- **Any other options for the digital conversion of self-help television retransmission sites.”**

The extent to which a full range of options for converting current analogue transmitters at self-help sites to digital is available is dependent to some extent on the methods that free-to-air broadcasters use to distribute their own digital free-to-air television services to their own digital terrestrial television sites.

In some cases, if multiple commercial services are multiplexed together and make up a combined single transport stream (as in WA), this could be delivered by satellite to a self-help retransmission site and these multiple services retransmitted

by one digital terrestrial transmitter without any local multiplexing. Therefore, there may not be any automatic connection between a single digital transmitter at a self-help transmission site and a requirement for multiplexing facilities in order for it to transmit multiple services.

However, where one broadcaster distributes its digital terrestrial program services by satellite, while other broadcasters' digital services arrive at the self-help site off-air from another digital transmitter, or through some new terrestrial link, it is going to be difficult for a single digital terrestrial transmitter to output multiple services without having significant local processing and some form of multiplexing arrangement prior to the transmitter.

Optus notes that at the only two digital terrestrial television self-help sites rolled out so far, at Port Stephens and Springbrook, the broadcasters have determined to hold the required licences for the facilities. It is assumed this is because of the more complex operational digital environment, particularly where off air feeds from broadcaster owned digital terrestrial sites or single frequency networks are involved. This is practical evidence of how operational arrangements and degrees of broadcaster involvement may change when the existing analogue television terrestrial self-help transmission sites convert to the more complex digital environment. On the other hand, Optus understands that at the vast majority of, if not all, analogue terrestrial television retransmission sites, the free-to-air broadcasters have little or no formal or regulatory involvement in the facilities and do not hold licences associated with the equipment.

It seems therefore that no matter what particular model of digital terrestrial transmission is adopted at self-help retransmission sites, the level of complexity involved is greater than in analogue.

This may make digital terrestrial transmitter options problematic, particularly where multiple methods of getting the program signal of the various services to the site are used or where the site is in a relatively isolated area and access to qualified maintenance technicians is hard to achieve in a timely manner.

For operational and cost effective reasons it is certain that some communities that are currently served by self-help analogue television retransmission facilities will, after analogue switch-off, become DTH communities. Equally, it seems certain that other communities and homes currently adequately served by analogue free-to-air broadcaster terrestrial transmitter sites will need to convert to DTH before analogue switch off because they will fall into new digital reception black spots.

## 7.2 Issue 2

**“Whether the DTH option for viewers residing in remote areas of Australia where the population is less than 500 should be adopted, rather than converting existing self-help retransmission sites from analogue to digital”.**

Optus believes that the scope of the above issue/question should not be restricted to just the remote areas. Already perhaps 10,000 fixed location homes in Australia have authorised ‘out of area’ DTH facilities and many other itinerant Australians are using DTH as their method of accessing free-to-air television services as they move around.

Further, as is indicated in the last sentence on page 8 of the DCITA discussion paper (... “on the other hand, it is possible that digital coverage may not exactly match analogue coverage, requiring the establishment of new self-help sites where such facilities do not currently exist ....”), the reality is that new digital terrestrial television reception black spots will be identified in the metropolitan and regional areas during the course of the digital terrestrial television transmitter rollout.

When will the industry know where these areas are? When will the industry know how many homes are affected? Will it be cost effective for anyone to put in new digital terrestrial self-help black spot facilities to service these homes or areas? Will there be spectrum available to enable new digital self-help retransmission sites to be developed in and near some of the larger regional centres and in the metropolitan markets?

Optus believes there will be a growing number of people in the current regional and metropolitan markets who will need to rely on DTH as their means of achieving reasonable access to free-to-air digital television services.

Hence, the concept of existing self-help communities converting to DTH at a particular population or TV home cut-off point, should not be confined to the remote areas. It is likely to be a relevant option for the regional areas and the metropolitan markets as well.

It is possible however that, when decision-making authorities are asked to determine whether the “equal coverage to analogue” trigger for analogue switch off to occur has been reached, a ‘backup’ DTH service consisting of commercial free-to-air television services emanating from Queensland and the Northern Territory (in Queensland and Central Australian time respectively) will not be regarded as meeting the requirement in say NSW and Victoria.

Optus notes that in the United Kingdom at the end of March 2007 nearly 900,000 homes accessed their entire range of digital free-to-air services by satellite, mostly provided by BSkyB (without any on going subscription).

Further, on 27 April 2007 the BBC announced that, through a joint venture with ITV, it would establish a new separate Freesat service carrying BBC, ITV, Channel 4 and Channel 5 digital free-to-air services in 2008.

While the United Kingdom coordination arrangements for terrestrial broadcasting spectrum are more extreme than Australia's (due to the proximity of a number of other European countries), and the United Kingdom does not have the same separate remote area, regional and metropolitan television markets as us, the basic *raison d'être* for the UK DTH backup service will be evident in Australia.

Optus believes that integrated thinking should occur now as to how relevant and appropriate 'back up' digital free-to-air services can be made available by satellite to the remote areas, regional areas and metropolitan markets through cost effective use of digital satellite capacity.

If the various likely requirements for primary and back up DTH services are considered and developed in a piecemeal fashion (ie. Part A areas; Part B areas; and all self-help sites, independently and at different times), several different versions of the same services, requiring different satellite capacity are likely to develop over time to meet the different distribution or DTH needs identified.

As an example, currently one major broadcaster in Australia has fundamentally the same program material carried via three separate satellite capacities in order to deliver its services to four different audiences.

Optus believes that self-help communities of less than 500, or 180 television homes, in the regional areas and metropolitan television markets should also be considered for conversion to DTH just as the question is raised for the remote areas.

### 7.3 Issue 3

**"Any views regarding the timing of digital conversion of self-help retransmission sites".**

For reasons outlined earlier in this response, Optus believes that the method of conversion of existing self-help retransmission sites and the current DTH audience to digital should be determined before various options are removed, or made less cost effective by developments in the implementation of the Part A and Part B Digital Conversion Schemes by the relevant broadcasters.

For example, if conversion of self-help analogue television retransmission sites only occurs towards the end of the implementation of the Part A and Part B digital conversion process, then it may end up being more expensive for the organisations

that will fund it and may hold back "equal coverage to analogue" being declared, and hence analogue switch off in relevant coverage areas.

It seems logical that actual conversion of various self-help retransmission sites occur in line with the otherwise stated analogue switch-off deadline for broadcaster owned and controlled terrestrial transmission sites.

The work of converting Australia's 650 self-help terrestrial retransmission sites containing something like 2,500 analogue transmitters, and/or the conversion of many of the relevant communities to a DTH option, will be a significant engineering task and require significant public education and assistance in what are often the most difficult communities to reach.

Optus believes that it has a role to play in helping to project manage some of these matters and in this sense looks forward to working with other organisations and, in particular, with Digital Australia and/or any taskforces that it may help establish.

To the extent that analogue self-help television transmitters are converted to digital, and at the same time various communities may convert to DTH, it is likely that Optus would also work closely with any terrestrial transmission services provider involved such as Broadcast Australia.

Optus notes that in the United Kingdom the establishment of two major, but separate satellite platforms, both of which will provide the complete range of relevant free-to-air digital television services will be available before the first major region of the United Kingdom switches off analogue in 2008.

The BSkyB based Freesat option has been in existence for several years and already has in the order of 900,000 connections (£150 one off equipment and install fee).

The BBC and ITV Freesat consortium will be transmitting all relevant digital versions of free-to-air services from satellite in the first half of 2008.

The consideration of backup DTH digital free-to-air services in regional and metropolitan areas and how these could affect discussions concerning DTH options in the current remote areas, and vice versa, should be put on the agenda sooner rather than later.

END OF SUBMISSION