Submission 109
Date received: 25/02/2011

THALES

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28 February 2011

Mr Andrew McGowan
Committee Secretary
House of Representatives Standing Committee on
Infrastructure and Communications
PO Box 6021
Parliament House
Canberra ACT 2600

Dear Mr McGowan

SUBJECT: THALES SUBMISSION TO THE HOUSE STANDING COMMITTEE ON INFRASTRUCTURE AND COMMUNICATIONS – INQUIRY INTO THE ROLE AND POTENTIAL OF THE NATIONAL BROADBAND NETWORK

This submission to the Inquiry into the role and potential benefits of the National Broadband Network is provided on behalf of the Thales Group. Thales thanks the Committee for this opportunity to make a submission and wishes to advise that if we can support the work of the Committee in any way through the provision of further information, or by attending a public hearing as required, we would be happy to do so. My direct contact details are or .

Yours sincerely,

Alan TEBB
Director
Sales and Marketing Operations
Thales Australia

Enclosure.

1. Attachment 1 – Thales submission to the House Standing Committee on Infrastructure and Communications – Inquiry into the Role and Potential of the National Broadband Network.

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THALES SUBMISSION TO THE

HOUSE STANDING COMMITTEE ON INFRASTRUCTURE AND COMMUNICATIONS

INQUIRY INTO THE ROLE AND POTENTIAL OF THE NATIONAL BROADBAND NETWORK

1. SUMMARY

The following key points summarise the Thales input to the Committee.

- Within four to five years from today, Australia could be operating a space based, broadband capability as part of a national broadband network that will propel us to the forefront of communications enabled nations and ready Australia for the 21st Century growth and development challenges to come.
- The latest generation Ka band satellite systems deliver high performance solutions across:
  - Social, educational, commercial, scientific, and resource sector applications
  - Defence, search and rescue, and border control.
- The space based component of the NBN broad band network is the only element that will provide a 24/7 footprint covering the whole Australian landmass, littoral ocean area and island territories with a high speed, high capacity link to take satellite application performance from marginal to mainstream.

2. INTRODUCTION

The proposed National Broadband Network (NBN) for Australia represents a mega-infrastructure project with long term benefit to the nation. Other developed countries such as the USA, France and Singapore have also concluded that a national approach to a broadband communications backbone is an essential requirement for knowledge and wealth creation in an information dependent age. The technology plan adopted by NBN will see around 93% of all Australians connected through a terrestrial fibre optic network supplemented by wireless capabilities reaching an additional 3% of the population and a space based capability to connect the remaining 4%.

As the world's largest producer of commercial spacecraft, Thales will confine its remarks in this submission to the space and associated ground systems component of the NBN plan. Our rationale for submitting this paper to the Committee is to highlight our experience in the design and delivery of similar systems for other countries, and to provide our insight into the positive impacts that investment into space based, broadband communications capabilities can deliver. Thales has a long history of commercial activity in Australia, and we see the proposed broad band vision for Australia as a fundamental step in our nation's long term position alongside other technologically advanced societies.

3. HOW WILL SPACE TECHNOLOGY MEET THE NBN REQUIREMENT?

In Thales's experience, and based on the subscriber data provided by NBN Co., a typical space and ground segment solution for Australia's broadband requirement can be achieved using:

- Two or three Ka band satellites in geosynchronous orbit.
- Eight or nine gateways spread around Australia, and

- Two Telemetry, Tracking and Command (TT&C) facilities to control and monitor the satellite whilst in orbit.

A satellite lifetime of around 15 years is achievable and appropriate given the pace at which technology in Ka band communications is moving, and the inevitable desire to replace the first constellation of satellites with improved technology and capability within an economically viable time frame.

Unlike either the fibre optic or wireless components of the NBN solution, satellites provide a 24/7, nationwide coverage from the Cocos Islands in the West, to Norfolk Island in the East and from the Torres Strait in the North to Macquarie Island in the far Southern Ocean. Satellite beams can cover the entire Australian landmass and critical areas of the littoral ocean where drilling and other resource activities are located.

Ka band satellites are at the leading edge of broadband communications technology and are rapidly replacing older Ku band satellites and technology. Ka band satellites can adjust the power, bandwidth and coverage of individual spot beams to accommodate subscriber demand and density as needed. Satellite on-board processing can be applied to beams where difficult weather and seasonal changes can be predicted, such as the seasonal 'wet' in the tropical north, and therefore compensate for these effects.

Satellites provide a very high level of reliability and redundancy through on-board systems, or through cooperative strategies between satellites and/or through in-orbit or on-ground spare satellites waiting to be activated or launched if needed. Due to these inherent advantages, demand for satellite based services will undoubtedly grow as the capability and utility of Ka band systems become apparent to an eager and technology hungry Australian commercial and consumer base.

4. ADDRESSING THE COMMITTEE'S TERMS OF REFERENCE

The space based component of the NBN network is ideally suited to contribute to the full range of activities listed in the Committee's terms of reference. In many cases the application of satellite communications to many of these areas is not new. What is different is the speed and quality of service provided by the latest generation of Ka band satellite systems, which finally deliver the level of performance that elevates past application performance from marginal to mainstream.

a) **Social applications**. In the areas of education, health and social cohesion, a satellite based broadband communications system will bring high speed and reliable communications to many remote and disadvantaged communities. From small towns to individual homesteads, and from remote fixed installations to users that need roaming coverage, subscribers will be able to build dependencies based on a more capable communications link for the transmission of voice, data and video, at speeds and at a quality of service not previously achieved or experienced in these areas.

Thales has witnessed an example of the social benefits of using its broadband satellite systems to link hospitals in rural areas of southern France, with centres of expertise in larger cities, for the provision of remote consultation services, expertise and interactive training. The use of broadband satellite technology in this way has resulted in continuous medical education for doctors and has attracted new doctors into these disadvantaged areas. The effectiveness of broadband links for medical consultations has reduced the need to transfer people to larger cities for treatment, leaving them close to their families whilst still receiving high quality care.

b) **Commercial applications**. Small and remote businesses that may not have viable point of sale technologies (taken for granted in the large cities) will be equipped to deliver a much higher quality of service to customers. With a satellite broad band system businesses will be able to link to financial institutions, suppliers, and even trucks on the road for real time transaction and logistic support and services.

c) **Scientific applications**. Where scientific measurement or monitoring requires long term data collection using remote equipment stations, satellite broadband coverage is the most effective solution. Instruments that measure a broad range of geological and atmospheric conditions are increasingly vital components in our ability to monitor and understand our environment. Remote instruments connected to a satellite broadband system can meet higher demands for data and real time manipulation by remote control.

d) **Resources applications**. The continued growth of mining, exploration and survey will place greater and greater demand for data, and perhaps video intensive services, into what are typically remote and hostile environments. Satellite broadband services can accommodate this need based on coverage of the entire landmass and coastal regions where much of this activity takes place.

The transportation of minerals from mining sites to coastal areas for ship transportation to other ports involves significant transport infrastructure spread over great distances. The control of trains and ground vehicles is a major safety concern for all mining companies. Transport monitoring systems linked by satellite to central control stations located far from the actual mine site can maintain minute by minute control over these vital operations and expensive assets.

e) **Defence, search and rescue, and border control**. With a persistent, 24/7 coverage across the whole country and within defined areas of the littoral, organisations in the defence, search and rescue and border control areas will be able to feed back data or video intensive material in real time to command and control centres anywhere in the country.

Thales examples of such applications include an emergency medical response system designed to respond at times of crisis management. This broadband satellite based system has been deployed since 2009 in French Guiana where it is used to support search and rescue missions in the event of an air crash, hurricane or volcano.

Another example of the benefits of satellite broadband technology was illustrated during the Haiti relief effort following the tsunami of 2010. Thales deployed an emergency communications container which was able to restore telecommunications in devastated areas, enabling rescue teams to communicate with their control headquarters through GSM/GPRS/EDGE or even Wi-Fi connections. This fly-in and near 'instant' setup of a satellite linked, deployable capability, contrasts sharply to the time taken to restore communications to cyclone Yasi devastated areas of North Queensland. Systems such as those designed by Thales can provide vital communications links to bridge the gap between a major disaster event and the rebuilding of mobile telephone towers and terrestrial links.

5. BUILDING JOBS AND TRANSFERRING TECHNOLOGY

Thales has built many space based systems for governments and customers throughout the world. Typically the pattern of job creation and technology transfer into a new market is

consistent. It begins with the 'upstream' activities associated with the build and delivery phase of the project. Australia can expect that in the satellite design and build phase the satellite builder will train and expose Australian engineers to the full technology involved in an NBN spacecraft. At an appropriate point in the project these engineers would return to Australia to manage the implementation of the space segment on the ground with the active support of the satellite manufacturer. Australian businesses will be involved in the construction of TT&C antennas and facilities and can expect to maintain these systems for the next 15 years.

The ground based gateways linking the satellites with the wider NBN network will be situated around the country, sometimes in remote and difficult terrain. Up to nine of these gateways will comprise at least three large dishes in each location, plus associated buildings for switches, routers, power and air-conditioning. Building and maintaining these facilities over a typical 15 year period is a significant workload employing local technicians and businesses in supporting ongoing service delivery and performance.

When the space and ground segments are complete, the opportunities for 'downstream' businesses multiply exponentially. Retail providers of broadband services will deliver satellite based applications to over 200,000 subscribers initially. Businesses, universities and other organisations will develop applications to take advantage of the infrastructure backbone which in turn creates a knock-on effect that spreads outwards into all areas of society. The internet is perhaps the best example of an upstream investment leading to downstream applications that have permeated almost every aspect of our communications environment. This same pattern of upstream activity followed by an explosion of downstream innovation has been witnessed many times in communications and computing markets. The NBN network will propel a similar effect through the Australian economy.

Once established, a space based capability to deliver broadband communications will inevitably grow in importance. This first investment by NBN Co. will add to the already significant expertise established by operators such as OPTUS and develop a generation of engineers, technicians and operators ready to take a larger role in the up-stream creation of follow on space and ground segment projects.

Local companies such as Thales provides the perfect nexus to bring global space based technology into the country, establish the technology foundation through delivery and support contracts, education and R&D programs to nurture the workforce necessary to move on to other space based opportunities ranging from the Square Kilometre Array radio telescope in the next 3-5 years to a Synthetic Aperture Radar satellite for Defence by 2020.

6. BACKGROUND ON THALES

6.1 The Thales Group

Thales is a global company with 68,000 employees in 50 countries generating around A$17.25 billion in annual revenues. The Group's two main sectors are Aerospace and Transport, representing about 40% of revenue, and Defence and Security accounting for the remaining 60%. Around 20% of revenue is invested in R&D to anticipate and address customer requirements today and into the future.

6.2 Thales in Australia

In Australia Thales employs around 3,300 people at over 35 sites, 30% of whom are engineers and researchers. In 2009 the company generated A$1 billion, and in the past 10

years it has exported more than A$1.6 billion in products and services. Thirty-five per cent of Thales's activity in Australia is in the Aerospace, Air Systems, Transport and Security markets, the remaining 65% is in defence business.

6.3 Thales Alenia Space

Thales's space business employs 7,200 people in four countries generating A$2.67 billion in revenue in 2009. Telecommunication satellites and systems represent around 51% of all space business making TAS a world player in this market. Unlike many other market players, TAS specialises in complete end-to-end solutions from the satellite design phase right through to the delivery of services to customers.