



13 April 2007

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Dear Sir,

Comments on UWB Discussion Paper

Nortel welcomes the opportunity to comment on the IDA's paper on UWB. Nortel is a major contributor to the development of the mobile WiMAX standard and has identified WiMAX as key technology to which it is directing considerable resources.

For sometime the WiMAX and cellular industries have been concerned about the potential interference from UWB and, recognizing the desirability of permitting a range of technologies to share spectrum where possible, have proposed limits to minimise interference from UWB. While not a direct participant in the satellite industry, Nortel understands that UWB has the potential to interfere with satellite services.

A cautious approach is highly desirable because once a technology is deployed it will be in use for a long time during which the usage of some of the effected spectrum bands may change. For example current consideration for the World Radio Conference may see bands that could be impacted by the IDA's decision designated as bands for future mobile broadband (IMT) services. While Singapore may have no plans to use these bands for this purpose at this time, global developments may lead to a future change of view as to the best use of bands but decisions made about UWB and other technologies may unnecessarily restrict the options available.

Nortel suggests that IDA considers the following principles:

- new technologies such as UWB should not be subject to unnecessarily stringent limits, but other services and technologies (3G, 4G, WiMAX etc) should be protected from interference from a technology which has the potential to



operate across many bands and once in the hands of consumers cannot be withdrawn or changed

- o to allow international roaming and recognising the rapid movement of technology across borders, it is essential that international best-practice is followed so that devices approved in one country do not cause interference in another and to allow large scale manufacturing for the global market

Answers to questions in the discussion paper

Q1 Views and comments on the proposal to allow UWB devices to operate in frequency bands which are used for other radiocommunication services such as the fixed-satellite (FSS), fixed services (FS) and radionavigation

Nortel strongly recommends technology neutral regulation of spectrum usage. It supports the proposal provided that adequate protection of existing and likely future services is provided and that the proposal is widened to any technologies that meet the requirements imposed to manage interference.

Q2 Views and comments on the possible scenarios of harmful interference from UWB devices to other licensed band and the possible measures to reduce the risk of interference.

UWB has the potential to cause serious interference to other services operating in the same spectrum, such as cellular mobile and WiMAX services and including extended C-band satellite services, unless sufficiently stringent emission limits are imposed. For this reason, Nortel recommends that limits adopted by the ECC but without the higher limits allowed for devices with interference mitigation techniques (for example Detect and Avoid), until the efficacy of these techniques is proven in real world use. The reasoning behind this is that it is always easier to relax limits in the light of experience but extremely difficult to prevent the use of products that are causing interference once they are allowed in the market.

It is important that Singapore adopt limits that are the same as those implemented in major markets to provide the best opportunity for Singapore manufacturers to develop and supply products to the global market. If Singapore adopted less stringent limits, in the current world of rapid proliferation of consumer devices across borders, it would be difficult for other countries to prevent these devices being used in their countries and potentially interfering with services that are planned on the basis of devices with lower emission levels. If unique Singapore regulations are adopted, there is a possibility of fragmenting the UWB market as



different regulations would apply in different countries and thus may compromise market viability.

Q3 Views and comments on the proposal to adopt a licence-exemption approach for UWB consumer and business data communication systems which comply with the UWB technical specification and operate with peak emission within the 3400 MHz and 10600 MHz band.

As with the success of WiFi as a consumer technology with low cost devices, a licence-exempt approach is the only practical way to proceed but it is essential that unlicensed UWB devices comply with the technical specifications. It also requires a very cautious approach to potential interference for the reasoning above.

Q4 Views and comments on the proposal to allow unlicensed UWB devices implemented with mitigation techniques to operate at a higher peak emission level within the 3400 to 4800 MHz band as compared to generic UWB devices without mitigation techniques.

At this time, mitigation techniques are unproven and it would be prudent to delay setting higher emission limits until practical experience with consumer devices using the techniques.

Q6 Views and comments on the proposal to license, on a case-by-case basis, the use of UWB imaging systems with peak emission below the 960 MHz or in the 3400 to 10600 MHz band.

Imaging device operation should be disabled unless device is operating against surface being examined. Emissions into free-space should be limited to being less than the UWB communication limits for that frequency

Yours faithfully