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Geneva, 27th February 2004 [®]

Digital Terrestrial broadcasting in Hong Kong - second Consultation Paper

Dear Sir,

Thank you for your kind invitation to provide a submission related to the second consultation paper. This submission is attached to this letter.

The response broadly outlines the developments that have taken place since our last submission and additionally responds to the critical requirements for a digital standard for Hong Kong.

Since our last submission many more countries have adopted DVB-T and our continued market led approach is creating standards, which bring the convergence of Telecommunications, Broadcasting and Internet ever closer.

Indeed DVB-T coupled with MHP and now DVB-H makes this the most powerful combination of digital broadcasting standards in the world

DVB would be most happy to attend the hearing on the 8th March.

Please do not hesitate to contact the undersigned if you require any further information

Yours sincerely,



Peter MacAvock,
Executive Director, DVB Project Office

February 2004

1. Introduction

DVB appreciate the opportunity to respond to the latest Consultation Paper on Digital Broadcasting for Hong Kong dated December 2005. DVB were pleased with the support received from the Hong Kong broadcasting Industry during the last consultative process and also for DVB-T to be nominated the then preferred standard for Hong Kong.

Since our last submission dated 27th February 2001, responding to Consultation paper Number1, a significant number of new developments have occurred within the DVB standards setting environment. Indeed DVB has now in excess of 40 interoperable standards and approx 20 technical implementation guidelines. These developments will be of interest to the Bureau, as we believe that they further consolidate the standards within the DVB family and broaden further the capability of the DVB-T system in providing the increased flexibility and scope of services that such standard can deliver.

In addition to these developments, more countries are adopting and implementing DVB-T services. Clearly DVB-T is now, the dominant world standard.

2. DVB Developments

Significant developments related to DVB include;

2.1 MHP

Multimedia Home Platform

The Multimedia Home Platform (MHP) standard enables the provision of enhanced broadcasting services including interactive programming. This standard is the only open world standard and is being adopted by most digital broadcasters. Typical MHP applications include;

- Electronic program guides
- Super Teletext - Text services
- Interactive applications related to TV programs
- E-Learning & E- Commerce
- Interactive games
- Interactive advertising
- Internet access etc

2.2 GEM

Globally Executable MHP

This further development enables MHP to operate on delivery platforms other than DVB. Indeed GEM has made possible the adoption of MHP by OCAP in the US for application in US cable networks. Additionally it will also see application in both the US (ATSC) and the Japanese (ISDB) digital standards. MHP therefore is already the world standard for Interactive applications to broadcasters

2.3 RCT -T

Return Channel - Terrestrial

DVB specifications now cover the return channel technologies supporting all 3 dominant delivery media - Cable Satellite & terrestrial. The terrestrial development (DVB-RCT) will

enable the interaction channel to be provided through the same medium (VHF or UHF) spectrum as the main forward channel. A number of trial systems are now being established.

2.4 Mobile Services & Diversity Receivers

The unique modulation system of DVB-T using COFDM (Coded Orthogonal Frequency Division Multiplexing) makes for reliable reception of signals in a mobile environment. Indeed many countries that have adopted DVB-T are now successfully implementing such services. The more recent development of Diversity receivers has further expanded the options available for the provision of such services. Indeed it is now possible with commercially available receivers to provide both mobile services as well as services to fixed receivers (HDTV or SD multiplexes) all within the one transmission. This is achieved with the combination of Diversity reception and the use of Hierarchical modulation unique to DVB -T. The use of diversity receivers has also enabled successful and reliable reception of transmissions in situations not previously possible because of the relative improvement in receiver sensitivity.

2.5 DVB-H

DVB Handheld

DVB-H is the latest addition to the DVB family of interoperable standards. This specification will enable services to be provided to hand held devices such as mobile phones. Such services will include video and text services and will also include interactive services for such requirements as financial and E-commerce products etc. Associated with this development is the adoption of new and more efficient audio and video coding systems. (H.264/AVC). This will enable full motion video to be provided over such a transmission medium. Also it will enable IP services to be provided over DVB networks.

This standard uses a unique system of increasing battery lifetime in the receiver, which has been the limiting factor in providing such services in the past. Such a new standard will clearly revolutionize the hand held mobile markets and already plans are in existence for trial service implementation and products by manufacturers have been announced.

These are just some of the developments taking place in DVB.

3. Conformance with Technical Standard Criteria (Consultation paper)

DVB would now wish to comment regarding DVB-T compliance with the 5 stated criteria, which underpins the initial selection of DVB-T for Hong Kong.

1. Criteria 1 - High Spectrum Efficiency

DVB believes that this is a very significant and important requirement. The system for DVB-T uses COFDM modulation, which results in high level of immunity to multipath reception. This gives the system its unique ability to provide Single Frequency Networks with overlapping coverage and with all transmitters on the same frequency, vastly improving spectrum utilization.. Such capability can result in multifold spectrum efficiency improvements. Many countries that have adopted DVB-T use SFN's and are benefiting from this increased spectrum efficiency. These countries include Singapore, Australia, Spain etc

2. Mobile Reception

Mobile & Portable reception using DVB-T is already an available capability. The standard has been tested successful at speeds in excess of 300km/h. Many countries that have adopted DVB-T have introduced mobile services. These include Germany, Singapore and Taiwan whilst other countries have intention to introduce services in the future. It is to be recognized that Digital Terrestrial is the only medium by which mobile services are possible and gives the operator the ability to successfully compete with Satellite and cable which cannot provide such services.

As indicated earlier in this submission, the development of diversity receivers further expands DVB-T's capabilities in the provision of mobile services and improves the flexibility to operate in a much more efficient modes.

The recent development of DVB-H, which is fully compatible with DVB-T, now extend services to Hand held battery operated devices.

3. Channel Bandwidth

DVB-T standards include operation in all possible channel bandwidths used internationally. i.e 6, 7, & 8MHz. Indeed DVB-T has now been successfully implemented in all three. An interesting example is in Germany where services in both 7 & 8MHz exist. Multistandard DVB-T receivers are now commercially available which can operate in all three channel spacings.

4. Widely Adopted Standard

DVB standards are very widely adopted throughout the world. Indeed both DVB-S and DVB -c are virtually world standards whilst DVB-T is quickly following these two sister standards. Implementation of ISDB is confined to Japan whilst the ATSC standard has only been implemented in the US and South Korea. This needs to be compared with DVB-T, which has been adopted and implemented by many more countries. These are summarized in the annex to the discussion paper. Not included in this is India, which has long decided on the DVB-T standard, and services are now being implemented. This country being one of the most populous will effect in the longer term the economy of scale of receiver production costs. Receivers for DVB-T have seen a dramatic decrease in costs because economies of scale not shared by other standards together with very low IPR royalty charges have brought heavy competition in the world marketplace.

5. Interoperability with other Platforms

One of the key and unique advantages of DVB-T relates to it being a member of a large interoperable family of DVB standards. The advantages of DVB-T in this respect are;

- Receiving facilities for DVB-T, DVB-S and DVB-C can be achieved using a single set top box. Receivers of this kind only need small additions to give them this capability as a result of the high level of commonality between systems
- This results in higher economies of scale and hence cheaper receivers.
- From a broadcaster perspective networking transmissions with satellite operations is less complex.
- Because Hong Kong uses DVB-T and DVB-C systems these interoperability advantages can only be realized by using DVB-T

5. Conclusions

DVB -T has now been adopted and implemented by many countries all over the world. From current indications it has surpassed other available standards and will in due course become the world standard, a status that has already been achieved by its sister standards DVB-S and DVB-C. DVB standards are reviewed when necessary and further developments of the standard have continued to enable the provision of enhanced services including Interactive services, mobile services and more recently services to hand held receivers.

Because of its wide adoption and implementation coupled to interoperability considerations, receiver costs are exposed to extremely high economies of scale. This results in very cheap receivers and consequently a very fast take-up by consumers. This aspect leads to a successful, risk free implementation.

We commend DVB-T as the standard for Hong Kong