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By E-MAIL

Nripendra Misra,
Chairman, TRAI,
Telecom Regulatory Authority of India,
New Delhi, India,
India.

Geneva, 28th September 2007

DVB comments on "Consultation Paper: Issues relating to Mobile Television Service"

Dear Mr. Chairman,

Herewith the DVB Project would like to comment on the TRAI's consultation paper 9/2007: "Issues relating to Mobile Television Service".

This letter specifically relates to Chapter VII in the Consultation Paper 9/2007 on "issues for consultation" and is presented on behalf of the DVB Project: an industry led initiative development specifications for the delivery of digital television. DVB standards already form the basis of all digital television services in India – satellite, cable and terrestrial.

DVB-H is also the subject of extensive trials of Mobile TV underway in the Delhi region.

Should the TRAI move to regulate the technology for mobile TV, DVB strongly supports the adoption of DVB-H as the preferred technology. There are many reasons for this and include:

- A level of certainty provided to an industry in the early stages of market development. Mobile Television has yet to achieve mass market appeal and the selection of an appropriate truly open standard would ensure that industry would have some certainty as it invests in this new market
- Adoption of a global standard reduces costs.
  DVB-H services are on air around the world. The support provided to these launches by DVB members coming from all sectors of the industry ensure cost effective, technically excellent and flexible solutions. It is no surprise that DVB-H is rapidly become the global Mobile TV standard, and such economies of scale lead to lowest possible costs for those deploying Mobile Television services and their viewers.
- DVB-H comes from the DVB Project.
  The DVB Project is an industry body developing technologies for that industry: it is a grouping of peers. By adopting DVB technology in order digital television areas, India is already benefiting as part of a global family seeking to accelerate the transition from analogue to digital television and expanding the services available to viewers as it does so.
- Interoperability amongst television standards is important in Mobile Television
  DVB-H is very closely related to DVB-T – hence the ease with which trials have been

launched in India using frequencies in the UHF band. Not only is DVB-H interoperable with the DVB-T standard, but retains significant commonality with other DVB standards already used in India. Such commonality facilitates the technology convergence which is at the heart of the move to Mobile Television in the first place.

- Flexibility of deployment
  DVB-H has been deployed in SFN mode and in MFN mode. It has been deployed in free-to-air models (Finland), pay-TV models (Italy) and a mixture of both (Philippines). Such flexibility comes with the support of a DVB and its 270 members, and a wealth of implementation experience so important in such the early stages of an industry.

Presented in annex to this letter is an introduction to the DVB-H standard, it's technology and its deployments around the world. More information can be found on http://www.dvb-h.org and the DVB and its officers naturally remain at your disposal, Mr. Chairman, for any further information and consultation that may be required in support of your work in Mobile Television.

Yours sincerely,

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Responses to TRAI's Consultation Paper – information on DVB-H

What is DVB-H?

DVB-H is the leading global technology standard for the transmission of digital TV to handheld receivers such as mobile telephones and PDAs. Published as a formal standard (EN 203 204) by ETSI in November 2004, it is a physical layer specification designed to enable the efficient delivery of IP-encapsulated data over terrestrial networks. The creation of DVB-H, which is closely related to DVB-T, also entailed modifications of some other DVB standards dealing with data broadcasting, Service Information, etc. It is designed to be used as a bearer in conjunction with the set of DVB-IPDC systems layer specifications. A non-proprietary open standard, DVB-H has broad support across the industry and has been the subject of more than thirty trials around the world with services now on air in six countries.

Background to DVB-H?

When the possibility of a dedicated DVB specification for broadcasting to handhelds was first discussed, it was in the context of the proven mobile performance of DVB-T, the widely adopted standard for digital terrestrial TV. The key applications considered were mobile TV, video streaming in general and file downloads, all targeted at handheld receivers that would operate with a limited battery life and in difficult reception conditions. As usual, the work of DVB's Technical Module was based closely on a set of Commercial Requirements. The most important of these were that there should be a significant power saving in the receiver compared to DVB-T, excellent performance and robustness in a cellular environment, and enhanced support for single antenna reception in single frequency networks (SFNs).

How does DVB-H work?

DVB-H is an extension of DVB-T with some backwards compatibility, i.e., it can share the same multiplex with DVB-T. It uses a mechanism called multi-protocol encapsulation (MPE), making it possible to transport data network protocols on top of MPEG-2 transport streams. A forward error correction (FEC) scheme is used in conjunction with this to improve the robustness and thus mobility of the signal. In addition to the 2k and 8k modes available in DVB-T, a 4k mode is added to DVB-H giving increased flexibility for network design. A short "in-depth" interleaver was introduced for 2k and 4k modes that leads to better tolerance against impulsive noise (helping to achieve a similar level of robustness to the 8k mode).

Another essential element of DVB-H is Time Slicing, the main technique used to achieve the required power savings. Each individual TV service in a DVB-H signal is transmitted in bursts allowing the receiver to go into sleep mode, only waking up when the service to which it is "tuned" is transmitted. For handheld devices this can add up to very significant power savings in the front-end. For battery life and thermal balance this is a key functionality. Statistical multiplexing is also possible in DVB-H, ensuring optimum use of bandwidth to deliver services. DVB-H is designed for use in Bands III, IV and V as well as L-band.

Market Deployment of DVB-H

DVB-H mobile TV services have been launched in Italy, Finland, Vietnam, India, the Philippines and Albania. The first service to launch, in Italy in June 2006, was reported to have 600,000 subscribers at the end of May 2007. More than thirty DVB-H technical and commercial trials have taken place all over the world and further commercial launches are expected in Switzerland, Austria, Germany, Spain, Russia and elsewhere. As analogue switch-off proceeds across Europe, the spectrum released in the UHF bands will

enable the widespread deployment of DVB-H networks. More recently, the European Commission has expressed strong support for the standard.

A recent report from leading analysts suggests that "overwhelming support from the wireless industry is likely to be one of the major drivers for the growth of the technology, as will be the increasing demand for content on the move. In short, DVB-H could well become a global standard similar to GSM. Furthermore, DVB-H delivers an improved end-user experience over current video streaming services that utilise cellular networks, while also providing broadcasters, cellular operators, handset manufacturers and silicon providers with tremendous growth opportunities."

The report suggests that revenues in this market are likely to reach US$ 2.04 billion in 2010. (Source: DVB-H Technology – Market and Potential Analysis, Frost & Sullivan, January 2007)

Next Steps for DVB-H

The DVB-H standard is fully specified and published. Some additional work is ongoing within the DVB Project revising the DVB-IPDC systems layers following extensive implementation experience, As with all elements of DVB-H, once finalised, the work is standardised as quickly as possible to facilitate implementers.

Summary: the key advantages of DVB-H

DVB-H is:

- an open standard with support and solutions from more than 60 manufacturers
- a mature standard with many commercial and trial deployments
- a flexible standard with a wide range of options for network design
- low power consumption with a high data throughput, allowing 30+ services in a multiplex
- specified for use in conjunction with DVB-IPDC system layer specifications
- can share spectrum and investment with existing DVB-T networks
- it comes from the DVB Project, a tried and trusted source of DTV standards