

**Report of the Sub Group on Going Digital under the  
Chairmanship of Member Secretary Planning Commission**

**Planning Commission  
New Delhi  
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## 1. INTRODUCTION

1.1 Information & Communication Technologies have taken a big leap forward and the distinction between broadcasting, telecommunications & multi-media services is disappearing very fast. Convergence is coming not only in technology but also in carriage infrastructure and receives. Major driver of convergence is digital technology. Digital compression technology enables transmission of the same information by usage of less bandwidth in the digital mode as compared to the requirement in the analogue mode. Digital technology is spectrum efficient and has been a factor to promote digital revolution. Digital Terrestrial TV (DTTV or DTT) is an integral part of the digital revolution that is sweeping the entire globe. DTT is the major driver for digitisation and needs to be promoted and incentivised in the light of its obvious potential and advantages.

1.2 The corner stone for the success of the broadcasting sector is undoubtedly the content it transmits – its quality, its relevance and acceptance. Traditionally, the television broadcasting has been predominantly on terrestrial mode using analogue technology. This broadcasting mode requires a significant and scarce resource - spectrum. Due to rapid advances in technology, the countries world over are moving from Analogue Transmission to Digital Transmission for the advantages offered by the digital techniques. Digital Terrestrial Television is an implementation of digital technology, which is implemented via a Set-Top Box, or integrated receiving device, that decodes the signal received via a Standard Aerial.

1.3 DTT provides a number of advantages over analogue broadcasting viz. better reception quality, increased channel carrying capacity, new features such as programme guides, multicasting as well as convergence of technologies. DTT has a potential to provide triple play, the three important components of content namely: voice, video and data with a very major advantage of freeing up of valuable spectrum resource.



1.4 DTT is transmitted on radio frequencies that are similar to standard analogue television, with the primary difference being the use of multiplex transmitters to allow reception of multiple channels on a single frequency range (such as a UHF or VHF channel).



1.5 The dawn of digital TV broadcasting will significantly help reduce the amount of radio spectrum required to maintain the present services. The savings in the frequency bands in the overall spectrum could help in rolling out other state-of-the-art services. Hence, any spectrum dividend depends much on the nature of future digital services, in particular the extent to which mobile reception and / or HDTV services are considered part of the standard service offering. The savings on the spectrum would also allow introducing more regional channels, which may be required in the future. The spectrum dividend arising from the migration could be put to use in a number of ways,

- Provision of additional TV channels
- TV enhancements such as mobile reception / HDTV / IP based TV
- Introduction of new convergent multimedia services and new applications such as 3G

## 2. DTT AROUND THE WORLD

2.1 DTT has become a reality world-wide already and many countries around the world have already launched digital Terrestrial Television

Services. The following Table shows launching of DTT and the closing down of analogue television in several countries:

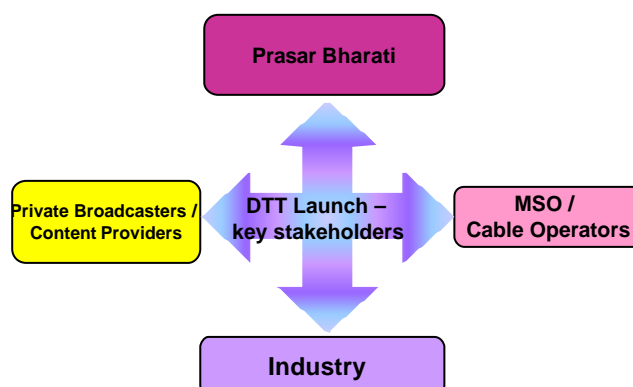
| Country        | Official launch   | Start of closedown    | Closedown finished                         | System used |
|----------------|-------------------|-----------------------|--|-------------|
| United Kingdom | 15 November, 1998 | Planned 2008          | Planned 2012                               | DVB-T       |
| Sweden         | April, 1999       | 19 September, 2005    | 21 November 2007                           | DVB-T       |
| Spain          | May 2000          | 2008 (Local channels) | 2010 (Rest of channels) /2009 in Catalonia | DVB-T       |
| Finland        | August 27, 2001   | August 31, 2007       |  | DVB-T       |
| Germany        | November 2002     | August 2003           | Planned ~2008                              | DVB-T       |
| Portugal       | 2002/2003         |                       | 2010                                       | DVB-T       |
| Faroe Islands  | 2002/2003         | December 2002         |  | DVB-T       |
| Belgium        | 2002/2003         |                       |  | DVB-T       |
| Netherlands    | 2003              |                       |  | DVB-T       |
| Italy          | January 1, 2004   |                       |  | DVB-T       |
| Switzerland    | ~2005             |                       |  | DVB-T       |
| France         | March 31, 2005    |                       |  | DVB-T       |
| Greece         | January 16, 2006  |                       |  | DVB-T       |
| Denmark        | March 31, 2006    |                       |  | DVB-T       |
| Turkey         | February 2006     |                       |  | DVB-T       |
| Albania        | August 2005       |                       |  | DVB-T       |
| Australia      | January 1, 2001   | Planned 2008          |  | DVB-T       |

2.2 DTT development and implementation requires all the stakeholders to be brought together and incentivised to drive DTT. This includes public and private broadcasters, Multi Service Operators (MSO) / cable operators and industries. Going Digital is a prerequisite to achieve the goals of higher growth, coverage and excellence in radio and television broadcasting during 11<sup>th</sup> Five Year Plan period. This assumes added significance and needs to be put on finite timelines in view of the fact that India would be hosting the Commonwealth games in Delhi in 2010. In fact Delhi city needs to go digital. Initiatives required are covered separately in this report.

2.3 The major thrust areas for information and broadcasting sector and Prasar Bharti, in the light of the competition in the market, is to enrich its content for quality entertainment, education and preservation of art, culture and music. Technological refurbishment across the sector with a view to retain its viewership and further build upon the same by covering uncovered regions of AIR and DD also to bringing Multi-Media services, such as interactive broadcasting, webcasting, telephony and datacasting, into sharp focus in view of the world wide transition from analog to digital transmission and value added services. Prasar Bharati needs to be prepared for telecast of Commonwealth games in 2010 in HDTV format which is a prerequisite for telecast. The host country needs to be fully geared up for this activity; otherwise, the host country could lose the telecast rights.

### 3. MANDATE OF THE SUB GROUP

3.1 Realising the importance and urgent need of addressing the issue of switching from analogue to digital transmission, PMO had taken a meeting and constituted a Sub-group under the Chairmanship of Member Secretary, Planning Commission. Accordingly, a Sub-Group has been constituted with membership from Ministry of I & B, broadcasting industry, entertainment electronics manufacturing association, domain experts, which met on 05.04.2006 and 10-10-2006. The mandate provided to the Sub-group was to prepare a road map for going digital keeping in line with international trends. The minutes of the first meeting is at Appendix-A. This report has been prepared after taking into consideration the inputs given by all the members and the discussions held during the second meeting on 10-10-2006. The discussions during the Sub-group meeting covered various issues related to the four major stakeholders, namely, (i) Prasar Bharti, (2) Private Broadcasters, (3) MSO & Cable Service Providers and (4) Industry



#### 4. INDIAN SCENARIO

4.1 The implications of going digital in respect of **Prasar Bharti** covering both Doordarshan and AIR have been identified which are as follows:-

- a) Studio conversion.
- b) Cost implication for analogue to digital terrestrial transmission.
- c) Utilisation of existing infrastructure of Prasar Bharti in the digital era.
- d) Suggested transition path.

4.2 The **Private Broadcasters** also need to evolve a transition path to move from analogue to digital transmission. The transition path and implication related to MSO and Cable Service Providers has been identified for implementation in two stages :-

1. Provide digital to analogue Set Top Box (STB) and switching over to last mile digital transition to be linked with Conditional Access System (CAS) roll out.
2. Ultimate transition to digital TV/Radio Receiver Set at the subscriber end.
3. The Cable Operators need to be trained to handle the new technology.

4.3 In this entire exercise, industry needs to play a central role in gearing themselves up in terms of competency building, repair, maintenance and production of digital receiver sets in a time bound manner and in synchronization with the analogue to digital migration plan of the broadcasters. Enabling interventions from Government would be required to help move to the digital era.

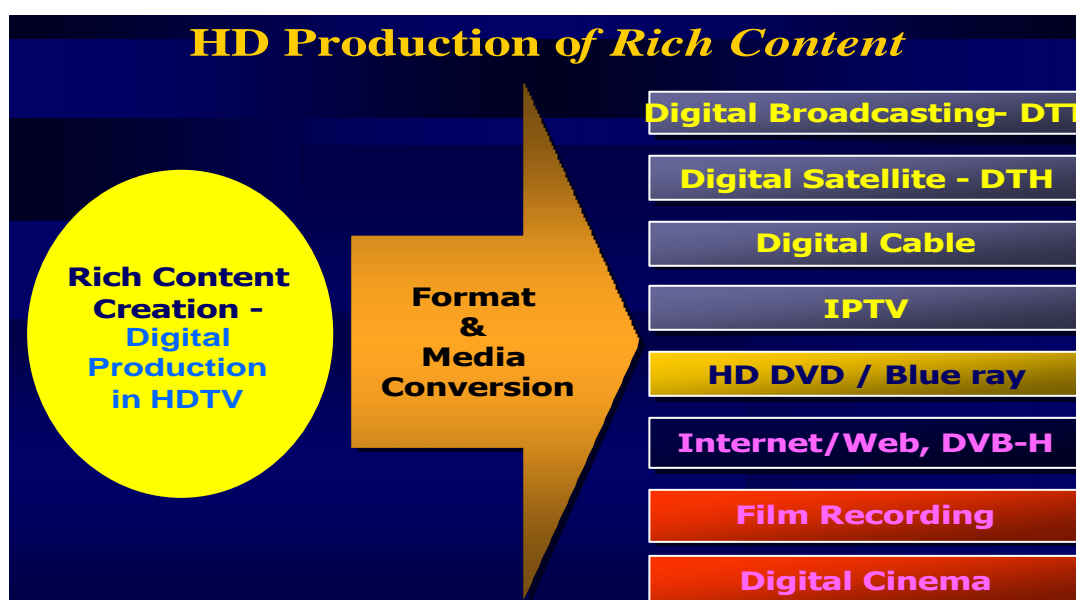
4.4 Digitisation of broadcasting leads to faster convergence of information, communication and entertainment sectors. This would also fuel creation of new market opportunities and help create conducive infrastructure for the introduction of new products and value added services in addition to improving the quality of existing services. Convergence of technologies will help in providing many services on a single platform like IPTV, Mobile TV, web casting and Pod casting. Digitisation and introduction of DTT is incomplete if HDTV is not embraced.

## High Definition TV (HDTV)

4.5 HDTV allows production and broadcast of TV signals with much higher visual information than traditional standards like PAL, NTSC. The important features of HDTV format are:

- Up to five times the resolution of SDTV.
- Wider Aspect Ratio of 16:9.
- Supports 5.1 channel Surround Sound.
- Picture quality comparable to 35 mm film quality.
- HDTV is a subset of Digital Television.

4.6 HDTV unlocks the potential of digitisation, as it is through HDTV that one could effectively introduce many value added services. Furthermore, more and more developed countries are insisting on HDTV coverage of important international events like sports. India hosting the Commonwealth 2010 Games, it is imperative for us to acquire the skill set and set up necessary infrastructure for production as well as transmission of programmes in the HDTV format. HD Master content can be converted to multiple high quality distribution media. The following viewgraph shows the potential of HDTV.



4.7 Prasar Bharati needs to prepare a road map for the introduction of HDTV in a phased manner starting from Delhi (2008) and extending it to all the six mega cities and coverage of Commonwealth Games in HDTV format in



2010. Establishment of Studio, Post Production, OB, EFP facilities at 4 Metro cities needs to be planned. In the first phase, 2 HD channels on DTH, HD terrestrial transmission at 4 Metros could be initiated. Prasar Bharati has already initiated a pilot project for content creation in the HDTV format and to gain experience in this area, which is a step in the right direction.

### **IPTV / Mobile entertainment**

4.8 India has worked out an ambitious roll out programme for providing broadband connectivity across the country which is affordable and self sustaining. Given the disparities in urban and rural connectivity, providing broadband connectivity in rural area which can provide triple play will make it sustainable and bridge the connectivity gap. As per the Broadband Policy, 2004, the following targets have been worked out for the growth of broadband and internet in the country.

| Year Ending | Internet Subscribers | Broadband Subscribers |
|-------------|----------------------|-----------------------|
| 2005        | 6 million            | 3 million             |
| 2007        | 18 million           | 9 million             |
| 2010        | 40 million           | 20 million            |

4.9 Broadband services have been introduced and plans are on the anvil to provide broadband services in 400 cities and service providers have plans to reach 1000 cities by the end of 2007. These cities include the 63 cities identified under the National Urban Renewal Mission. The real challenge is to connect the remote villages unconnected so far due to various reasons. One of the viable options for providing connectivity is through wireless mode.

4.10 Introduction of broadband connectivity opens up new market for providing value added services which can be derived from the digitization. Penetration of TV is much higher than PC in the industrialized countries. Providing interactive services including internet on TV and TV on internet. These services can potentially benefit especially the 'information poor' and thus reduce the information gap in the society, which is an important implication of the convergence. Internet on TV can be provided using Out Of Band (OOB) and In Band (IB) structures. In the IB structure the internet is transmitted alongside with the broadcasting signal. Here the characteristics of the broadcasting infrastructures will have a decisive role on the available services.

4.11 TV on internet which is also known as WEB TV/Cyber TV will be the future of broadcasting. A Precondition for the WEB TV to be able to replace digital TV is the transmission capacity at the end users site increases to such level that it can be possible to provide digital TV services. WEB TV needs to be co-evolved with digital TV and act as complementary for delivery of services.

4.12 Mobility has played a big role in the justification of Digital Terrestrial Transmission in all those countries where DTT has been implemented. The argument has been that it is the terrestrial platform which offers mobility. With 3G services being offered by the mobile service operators, providing mobile TV or mobile broadcasting becomes a reality. The Government needs to incentivize initiation of such services as mobility is the key parameter in future development of networks and services. Here the efficiencies gained by combination of broadcast and communicative services can be transferred to mobile market if broadcast networks are designed for mobile reception. Also with regards to spectrum efficiency this combination of terrestrial broadcast platforms and mobile platforms is important.

4.13 Different communication sectors have traditionally been regulated by different acts and also by different institutions. The convergence process and combination of broadcast and traditional telecom networks will require not only adjustment but also rethinking and redesign of the whole regulatory framework, thus the need for setting up a common communications convergence regulator.

## Digital Cinema

4.14 Going Digital would be incomplete if entertainment (film) sector is not covered. Digitization would help not only in controlling the distribution and exhibition of cinema in digital format but also takes care of an important aspect - **safeguarding the intellectual property**, which would encourage the industry to a great extent. The digital cinema system which is already a reality in the country would revolutionize the exhibition of films all over India. Some of the important benefits are given below:

### ▶ Curb on piracy

Software industry the world over is plagued by issues of piracy. However the Indian film industry faces almost 40% revenue pilferage due to piracy. In terms of money the industry loses approximately 2000 crore on account of piracy directly, on which the government neither earns Entertainment Tax nor Income Tax. Digital Cinema would help curb piracy in a proactive manner where instead of chasing after the pirates, it will make the pirates business unviable by providing an early and widespread release of films across the country and thus nipping at the bud the piracy issue. Furthermore, as there is no physical movement of the film, creation of pirated copies/ versions of the film is ruled out

▶ **Increased box office and Entertainment tax collections**

The early availability of films combined with high quality images and scheduling flexibility ensure increased box office collections. Early migrants to the digital cinema system have witnessed around 100% increase in revenue collections by way of increased box office collections and thus increased collection of Entertainment Tax and Income Tax.

▶ **Savings in Foreign Exchange and minimizing wastage in print**

Film prints are made from film stock imported from companies like Kodak, Agfa etc. 800 films with 200 prints each at a cost of Rs.50,000 per print entails an expense of 800 crore. As the prints cannot be recycled, it is a waste of money once it completed its life. However Digital Cinema does not use any prints, hence minimizing wastage and at the same time saving the country precious foreign exchange.

▶ **Employment opportunities in rural areas due to growth of new cinemas**

With the advent of Digital Cinema, niche cinema and regional language films shall be able to generate revenues, thus making the local film industry in the states more commercially viable. This will provide employment to local artists and technicians and other film industry related infrastructural suppliers.

▶ **Eliminates environmental pollution and Savings in Power Consumption**

Analogue prints are made from polyester and are destroyed by burning which is a huge bio hazard. Digital prints are mere digital files and can be simply erased from our server's memory. The Power consumption of a Digital Projection

System is far more economical as compared to the power consumption of an optical projection system. The annual power savings if digital cinema is implemented in say 200 theaters across the country works to 87,48,000 KVA.

▶ **Virtual shelf life.**

Print quality does not deteriorate with repeated use, and every show is as good as the first show and provides consistent high quality images irrespective of number of screenings.

▶ **Provides new business opportunities**

Over the past years, small town cinemas plagued by the piracy and failure of films coupled with availability of only old films have become economically unviable. This has seen the closure of many cinemas. However Digital Cinema shall bring the small town cinemas at par to the cinema halls in the big cities as the films can be simultaneously be released across the country, thus providing them a second lease of life.

▶ **New Compact Cinemas**

The advent of Digital Cinema has seen proliferation of new and compact cinema houses in small towns and cities. This shall provide additional business opportunities to local businessmen and also increase the State's revenue. With our efforts and research we have designed compact cinemas, which can be opened for a minimum investment.

4.15 Government needs to provide incentives for production as well as exhibition of films in the digital format in its own interest as the loss of revenue due to piracy is considerable. Production of cinema in digital format could be on lower tax regime and the theaters which have installed digital cinema exhibition facilities can be subjected to say lower entertainment tax.

4.16 There is a need to revisit the Cinematograph Act 1952, which is impeding the spread of digital cinema. There is a misconception that in digital cinema the screening is not made through cinematograph machine. For the growth of this important segment of entertainment, there is a need to incorporate digital cinema in the Cinematograph Act 1952.

4.17 Digital Rights Management/IPR protection is of paramount importance in view of piracy. Many content owners would be apprehensive in sharing their content as piracy is a major issue. Hence, adequate laws to protect the rights of the content owners need to be put in place so that they feel safe to share their content over digital platforms.

4.18 Content digitization is the corner stone and key to the whole process of going digital. Given the fact that content is owned by small, medium and big players, the small and medium players would find it difficult to digitized their respective libraries in the light of huge conversion cost. One way of overcoming this issue is to encourage content aggregators. A suitable regulatory/policy regime needs to be worked out to make this happen in a hassle free manner.

## 5. DIGITISATION – STATUS OF STAKEHOLDERS

5.1 Digitalization Programme of Prasar Bharati through its arms Doordarshan and All India Radio is discharging the role of Public Broadcaster in India. Over the years, it has taken various steps towards digitalization and the present status is given below:-

- **Satellite Transmission:**

Doordarshan is currently operating 27 TV channels. Satellite transmission of all these 27 channels is in digital mode. Digitalization of Satellite Channels has resulted in considerable saving in space segment capacity as far as the spectrum is concerned. In case of analog transmission, only one channel can be transmitted through a transponder whereas in case of digital transmission, five channels can be transmitted through the same single transponder. Doordarshan launched free to air DTH service “DD Direct Plus” in December, 2004 in digital mode.

- **Production Centres:**

Digitalization of Production Centres is a major thrust area of the 10<sup>th</sup> Plan of Doordarshan. As part of 10<sup>th</sup> Plan, 17 major Doordarshan Studio Centres are envisaged to be fully digitalized. Out of these 17 Studio Centres, 7 studio centres have already been fully digitalized. 30 smaller studio centres are envisaged to be partially digitalized during 10<sup>th</sup> Plan period. Out of these 30 studio centres, 9 studio

centres have since been partially digitalized. Work on digitalization of the remaining studio centres (10 major studio centres and 21 smaller studio centres) is expected to be completed, in phases, by end of 10<sup>th</sup> Plan period.

- **Terrestrial Transmission:**

Digital Television is the way of future, providing interference free reception and remarkable picture & sound quality. In addition, DTT is highly spectrum efficient. India had selected DVB –T system for introduction of DTT in the country. This selection was done by a Core Group comprising of representatives from Broadcasting organizations, Industry & Research Institutes etc. The Core Group was headed by Engineer-in-Chief, Doordarshan.

To gain experience in DTT technology, **Doordarshan commissioned four digital transmitters one each at Delhi, Mumbai, Kolkata & Chennai in January, 2003**, on a pilot basis. A research study about reception in a moving vehicle has also been carried out. Mobile TV has also been launched in Delhi in a limited way. Doordarshan has undertaken a pilot project for reception of TV signals on hand held devices (Mobile phones) utilizing the existing digital transmitter at Delhi. This experimental service is expected to be started during 2006.

It is a certainty that analog transmission will come to an end. Even though parallel technologies such as D-Cable, DTH, IPTV and Multimedia broadcasting would be prevailing, terrestrial transmission will have to continue on account of various reasons. Doordarshan, being the public service broadcaster will have to migrate to DTT in the years to come. Doordarshan plans to include schemes for digitalization of terrestrial transmission in 11<sup>th</sup> Plan.

- **Digitalization Programme of Prasar Bharati - All India Radio**

In order to provide the listeners with high technical quality radio programmes, All India Radio has planned to migrate from analogue to Digital. The status of digitalization of AIR and proposed plans is given below.

- **Programme Generation and Production**

By the end of 10<sup>th</sup> Plan, all the studio centres are expected to be equipped with the Hard Disk Based System for recording, editing and post production of programmes.

This implies that about 50% of the programme generation and playback activities would be digitalized. New Broadcasting House at Delhi employing fully digital studios and State of the Art technology has been commissioned. Substantial part of AIR's archival material which was in analogue form has been digitalized.

AIR proposes to move towards full digitalization of the studios by converting all studio equipment including digital wiring /connectivity etc. to Digital Mode. The Stations are proposed to store all their recording in central servers with storage to be set up at Delhi. The central storage site will also have a disaster recovery site. Each station is proposed to be provided with low end server for storage of scheduled programmes and other local equipment. Besides, all stations would be networked.

- **News Room Automation**

Central News Division at NBH Delhi has been digitalized and all the regional news units would be digitalized and networked during the 11<sup>th</sup> Plan period.

- **Transmission Set up**

At present AIR employs transmission in MW, SW and FM band in analogue mode only. Only one Low Power DAB transmitter at Delhi has been set up for experimental purpose. During 10<sup>th</sup> Plan, a pilot scheme employing 1 KW DAB Transmitter has been proposed at Delhi.

Keeping in view the world wide trends of transition in digital mode, AIR plans to introduce Digital Radio Mondiale (DRM) transmission below 30 MHz. i.e. MF and HF band by upgrading its existing DRM compatible transmitters. All new transmitters including the replacement of old transmitters would be done by DRM compatible transmitters. For transmission above 30 MHz introduction of DRM + and DAB are being examined.

However all digital transmission as and when introduced, will be in simulcast mode for about 10 years. This would be necessary as receivers in the beginning may be costly. Once the receivers become affordable by masses simulcast mode would be phased out.

- **Contribution and Distribution network**

Contribution & Distribution set of AIR comprising of uplinks, Downlinks and Satellite News Gathering is being upgraded to digital.

- **Expansion of DTH**

With a view to provide digital quality direct sound broadcast to the listeners it is proposed to expand the existing DTH services during the 11<sup>th</sup> Plan.

- **Other services proposed in digital mode**
- **DMB/DVB-H** - AIR has plans to introduce its audio multimedia contents both in satellite and terrestrial mode to the mobile hand held devices in DMB/ DVB-H/ other standards.
- **Multi-channel webcasting cum podcasting** – It is proposed to use Internet platform to serve listeners having internet connectivity. This will support non-linear listening.

5.2 **Requirement of spectrum for transition to Digital Radio**

**Transmission** – Though no additional spectrum is required for DRM transmissions in MW and SW band. However, additional spectrum would be required for DRM transmitters in FM and VHF band as well as 'L' Band.

5.3 **Cable TV:** Out of 61 Million Households cable connections

all over India, 35% are in rural areas. This service is easily available and affordable in the rural areas. This industry is geared up to meet the challenge of digital broadcasting. The present status is as follows:

- a) From uplink station to Satellite- already Digital
- b) From Satellite to Cable TV Headend- already Digital
- c) From Cable TV Headend to Subscriber – Digital/ Analog
- d) Most of the MSOs in the Metros and big cities have already gone digital.
- e) Only 7000 Headends required to go digital

5.4 All franchisees are not affected by Digitisation as they only

pass the signal (Analog/Digital) received from the Headend to the subscribers and do not process the signal. Digitisation of subscribers end depends on introduction of



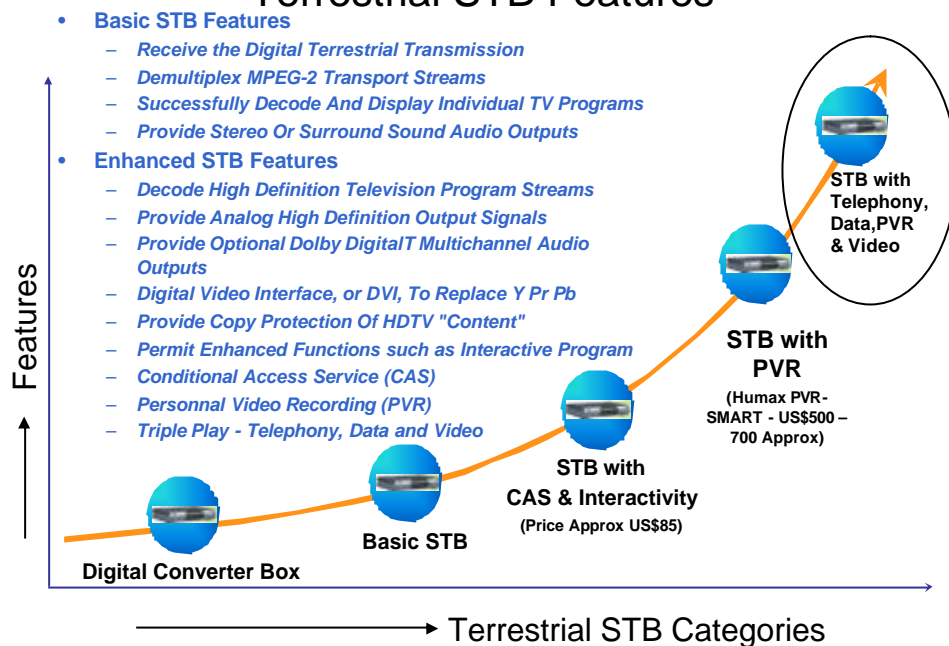
digital TV in the market at affordable prices and aim for digitalization of Cable TV headend immediately. To further galvanize the rollout, all the content producers – Prasar Bharati as well as private operators to provide agreed and identified channels in the digital / HDTV format to MSO / cable operators under “Must Carry” clause.

5.5 The major Hurdle in Digitisation presently is the absence of digital receiver sets. Coupled with this about 45% TV sets of consumers are Black and White. However, Set Top Boxes / digital CAS act as a catalyst for implementation of digitisation. The Consumer Electronics and TV Manufacturing Association (CETMA) has indicated that the cost increase in case of a TV set, capable of receiving digital terrestrial signal in addition to analogue signal would be about Rs 1000.00 from the existing prices. For the existing analogue TV sets, which are expected to be around 120 million by year 2010, the consumers would need to have DTT set top box (STB) to receive the signals. The cost of STB is presently about Rs 2250.00 and is decreasing every year by 7 – 8 %.

5.6 The industry would require a lead time of six months to meet the demand for the digital TV sets and radio receivers. Similarly, industry would be in a position to provide STBs in about 16 – 20 weeks from the time the government decides to change over to digital broadcasting.

5.7 For successful rollout, the government needs to firm up the transition path and announce timelines so that all the stake holders could put their acts together and make the transition as smooth and successful as possible. Success of DTT depends upon the availability of requisite consumer end equipment and introduction of STB coupled with CAS. India is a price sensitive market and one solution or product fits all case is not commensurate with the consumer thinking. Hence we may have to introduce various models of STB (plain vanilla model having Digital to Analogue converter with addressability of channels with CAS to high-end models) with increasing value added features to meet the requirements of the consumers. The requisite standards need to be put in place for the STB so that issues such as interoperability, after sales service etc., could be taken care. The view graph below gives different categories of STBs with features.

## Terrestrial STB Features



Presently there are about 61 million cable TV homes and each one of them is a potential candidate for migration to digital format on implementation. In order to make this happen and create demand, indigenous manufacturing of digital TV set & STB, needs to be incentivised by providing requisite fiscal incentives. The suggested incentives are:

1. The Excise duty on digital TV set, STB and its inputs be rationalized to 8%.
2. A State VAT of 4%.

Thus a total taxation level of 12 % is recommended. This will give impetus to the indigenous STB industry, which would generate economic activity and employment in the country.

## 6. SPECTRUM – THE HEART OF DIGITISATION

6.1 Going digital encompasses digital Broadcasting, telecom as well as other technologies for access and back-bone networks which deploy digital systems. While some of the frequency bands used for broadcasting have exclusive allocations for 'Broadcasting', most of the bands are shared with other services. For example, the 800/ 900 MHz bands used for cellular services – GSM & CDMA, etc. are available for broadcasting also. The satellite based TV broadcasting is mostly in the frequency bands, which are shared with microwave systems. Hence, while

evolving/ modifying the NFAP (National Frequency Allocation Plan), the relative national priorities of various spectrum based services have to be taken into account.

6.2 Normally digital transmissions require larger bandwidth. However, with modern compression techniques, which are improving continuously, it is now possible to accommodate multiple channels in the RF bandwidth of a single existing (analogue) channel. Hence, on complete transition to digital systems in broadcasting, the spectrum requirements should reduce or alternatively, it would be possible to transmit larger number of channels in the bandwidth occupied by existing channels.

6.3 During transition phase, existing analogue & the new digital systems would need to be broadcast together, requiring larger spectrum bandwidth. The requirements can be assessed once the number of channels for simultaneous transmission is worked out. With digital broadcasting, it is possible to include data, Internet, etc. within the broadcasting channels.

- **Digitalization of Radio Broadcast (FM Radio):**

During the migration from Analogue to Digital Radio, new frequency assignments are to be identified to facilitate smooth migration and for some time both the existing analogue transmissions as well as new digital transmissions would continue. Hence, there will be spectrum constraint during this transition phase. Also, the spectrum for digital migration may need to be identified for both Prasar Bharti as well as Private FM Broadcasters.

- **Digital Terrestrial Television (DTT):**

The frequency band which is mostly used for DTT services is 700 MHz band. TRAI has recommended use of this band for Broadband Wireless Access (BWA) and WiMAX services for rural areas. Therefore, before introduction of DTT, it is necessary that availability of spectrum in this band for DTT, along with possible sharing and co-existence of DTT with BWA/ WiMAX systems, are ensured.

- **Digital Broadcast through satellite transmissions:**

The Satellite Television Channels as well as DTH are transmitted even at present, mostly through Digital technology. However, M/o I & B has proposed use of 'C' and 'S' band for direct reception of TV transmissions. Presently, the DTH transmission is

carried out in 'Ku' band, though in the frequency bands meant for 'Fixed Satellite Service (FSS) rather than in bands allocated for Broadcasting Satellite Service (BSS). Extension of such digital transmission to 'C' and 'S' band needs spectrum coordination with other services/ applications. Mobile Satellite Service is also operating in the 'S' band and the spectrum in this band is limited. In addition, 'S' band is also proposed for use of BWA/ WiMAX technologies. Before introduction of 'S' band for digital satellite TV transmission, coordination/ sharing studies have to be carried out with terrestrial transmissions.

- **Value Added Services**

Conventional broadcasting is only one way transmission. If Triple Play, Value Added Services and interactive user choice etc. are to be introduced in the broadcasting as part of 'Going Digital', broadcast transmitters have also to employ spectrum efficient systems for better methodologies for frequency re-use including use of low power transmitters etc., so as to ensure optimal usage of available spectrum. For the introduction of Value Added Services along with Broadcasting, it is necessary that the telecom service licence conditions are also taken into account.

Mo I&B, private broadcasters and service providers along with department of Telecommunications (WPC cell) need to work in a coordinated manner to identify spectrum requirements keeping their rollout plans so that spectrum planning could be proactively made. A Spectrum Management Group could be set up to achieve this.

## **7. PRASAR BHARATI – FINANCIAL RESTRUCTURING COMMITTEE FINDINGS**

7.1 The Committee on Financial Restructuring of Prasar Bharati was setup with an aim to (i) Suggest a viable capital and financial structure for Prasar Bharati; (ii) Look into the role of Prasar Bharati as a public broadcaster and need to maximize its revenue potential while proposing a viable capital & financial structure. Secretary, I&B, pointed out, that while discussing the financial restructuring issues, the issue of digitalization of its services was also considered and appropriate model suggested as part of restructuring.

7.2 Mo I & B informed that with the implementation of digitalization the number of terrestrial transmitters would be reduced from the

existing 1400 to 700. For Doordarshan, the committee worked out four options based on various combinations. They are

1. Terrestrial without digitalization,
2. Terrestrial with digitalization,
3. DTH with terrestrial without digitalization
4. DTH with terrestrial and digitalization.

7.3 The restructuring committee recommended the 4<sup>th</sup> option which requires a capital investment of Rs. 3531.00 Crore for Doordarshan during 2007-15, which will help in meeting the growing demands. The financial details are at Appendix B.

7.4 Similarly, for AIR five options of future investment scenario were suggested considering various priorities such as replacement of existing MW, SW, and FM Transmitters; studio links, studio equipments, networking of stations, extension of coverage, expansion of FM coverage, DRM, external services, satellite broadcasting, multi-media, automation, digitalization and DTH with public broadcasting role. The options are:

1. No expansion and full replacement
  - (a) Option 1 plus urban existing FM Towers to relay existing FM stations
2. Digitalization, Multi-media services: 60% FM, 2 SWA Channels
3. Digitalization, Multi-media Services: 75%, 5SW Channels.
4. Digitalization, Multimedia Services: 100% FM – 5SW channels.
5. A mix of option 2 plus reduction in social broadcasting from 70% to 10%.

7.5 Out of these, the fourth option was recommended, which would require capital investments of the order of Rs. 5900.0 crore over 10 years, which will enable AIR to go digital. The financial details are at Appendix C. Thus Prasar Bharati would thus require Rs 9431.0 crore over a period of ten years. This funding towards capital would help in addressing the changing technology, move to the digital transmission, in providing efficient and high quality services and operations. The revenue generation capacity is expected to increase and it is

expected that Rs 16910.0 crores would be earned by Prasar Bharati during this period. However, with the Commonwealth Games being held in 2010, Prasar Bharati could substantially increase its revenue earnings if it can embrace new technology in its content creation as well as in transmission.

## 8. DIGITAL DELHI

8.1 With the Commonwealth Games scheduled to be held in Delhi in 2010, it is essential to use this opportunity to showcase India's strengths in IT and especially by turning Delhi into a world class city which is Network and WiMax enabled for the delivery of a reliable and effective technology platform to support the games. The Delhi government has drawn up a detailed roadmap for creating Digital Delhi. Some of the major initiatives cover facilities for the international visitors, participants, citizens and providing Games information

8.2 In order to address the above, various initiatives have been taken which include:

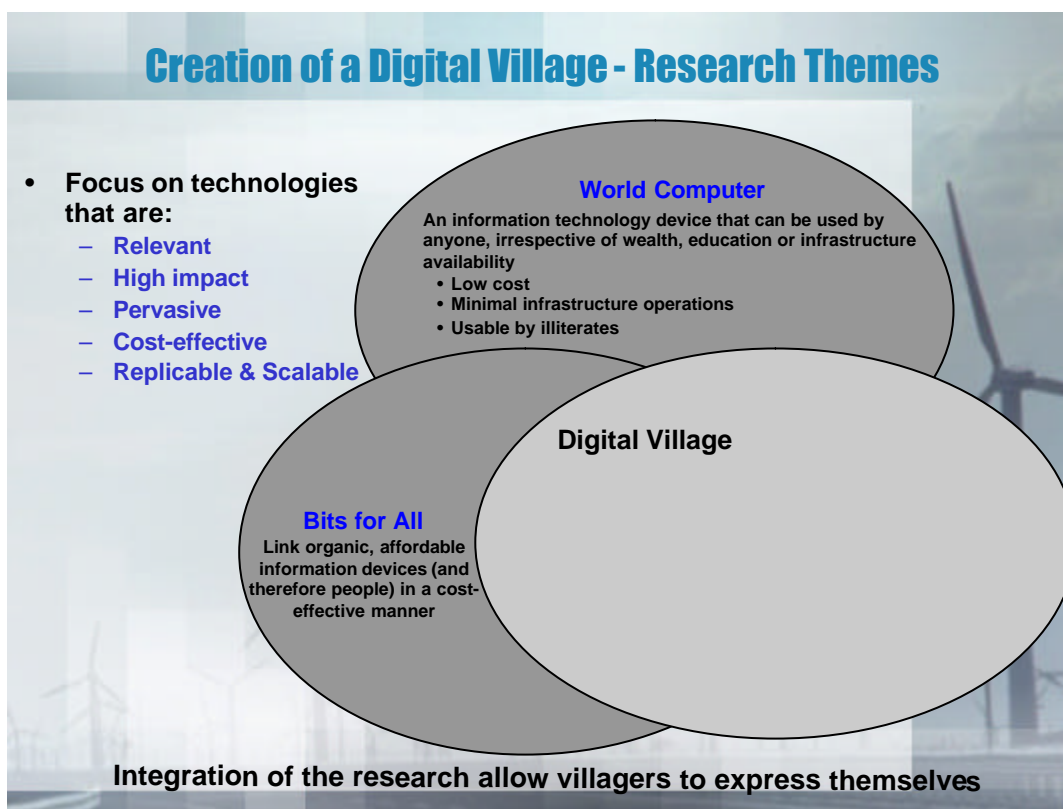
- ▶ Online hotel booking & cancellation – developing Delhi tourism portal.
- ▶ Forward planning of social activities in India by providing access to high-class electronic tourism services.
- ▶ Local area information on mobile phones
- ▶ Information Kiosks - For providing access to services in Delhi and games based services
- ▶ Airports, Railway Station, Bus Stands
- ▶ Stadiums
- ▶ Hotels and Tourist Places
- ▶ Urban Knowledge Centers
- ▶ Games Village
- ▶ Common Wealth Games Portal with details of common wealth games history, schedules, facilities, ticketing, etc.
- ▶ Virtual tours of games facility
- ▶ RFID identification of participants.

- ▶ Computerized help desk for all Games Related Activities.
- ▶ Metro-E network – fibre optic back bone with wireless PoPs – Delhi's own electronic network available at low/ no cost to citizens.
- ▶ WI-FI hot spots in games facilities, tourism facilities and public congregation facilities like malls.
- ▶ Public & Private content to be brought together under subject-specific portals like sports, transport, entertainment, health, etc.
- ▶ Creation of Intra Delhi & Knowledge portals.
- ▶ Well secured electronic gateway for payment of bills.

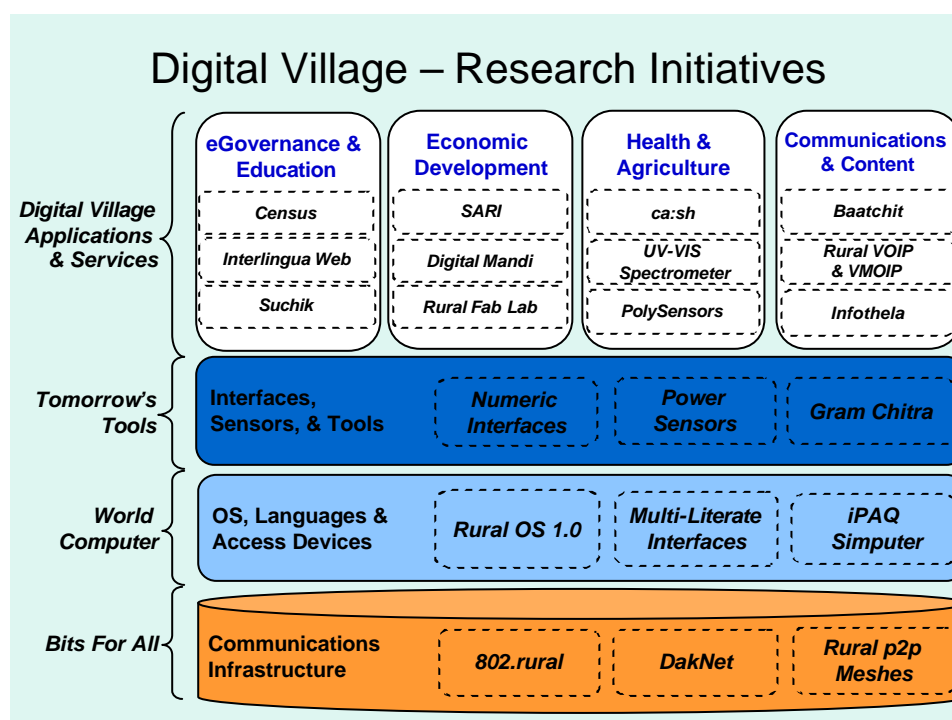
## 9. GOING DIGITAL FOR DIGITAL UNITE

9.1 Going Digital should not be seen as an exercise in isolation, but with a purpose. In fact it should help in **Bridging the Digital Divide** or help in **Digital Unite**. The digital technologies must help in the proliferation of the technologies and bring the fruits of ICT to the rural areas. Presently, rural connectivity which is predominantly voice centric is an unviable proposition.

9.2 To help bridge the digital divide, we need to **bridge or surmount the literacy, power and poverty barriers**, which are predominant in the rural area, which calls for rural centric technological interventions. In this regard, we need to create a digital device which surmounts the three barriers indicated above. We also need to create a ubiquitous network which facilitates instant broadband connectivity. In other words we need a **World Computer** and **Bits for All**. Putting these two together with **Tools for Tomorrow** which are rural centric will help in creating a **Digital Village** as indicated below.

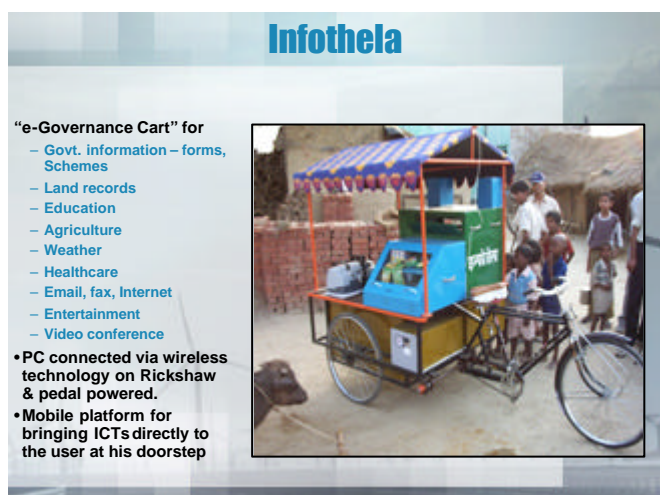


9.3 Creation of a Digital Village has many advantages. It can create a knowledge society; provide empowerment through the dissemination of information. Efforts are on for creation of such a village and various research initiatives being pursued are indicated below:





9.4 For any technology to be accepted, it needs to be related to the end users. The devices need to be user-friendly. Therefore, it is essential to have capabilities such as icon /menu driven, voice activated, touch sensitive screen input and local language capability built into the device. Government should encourage and generously fund activities like *Infothela* which help in bridging the Digital Divide. Major thrust is needed for developing applications in Indian vernacular languages.



9.5 With digitization of content and entertainment in particular and next generation networks coupled with the introduction of 3G services on the mobile platform, it is now possible for bridging the digital divide effectively through bringing in triple play and using home TV or the mobile phone as the bridging device. Also there is a need to encourage content creation at the local level in local languages through a specific genre of Rural Content Providers.

9.6 Triple play services riding on entertainment related applications would be able to create the most viable business models for the spread of rural connectivity. Applications of Wi Max technology will allow entertainment to rural areas and this will provide Ubiquitous Broadband experience to rural areas. Just as Wi Fi band has been delicensed, we need to move to the next step in encouraging proliferation of Wi Max technology for which the Wi Max band (2.5 GHz / 3.5 GHz / 700 MHz or existing Wi Fi band 2.4 – 2.48 GHz) could be delicensed for rural connectivity.

9.7 The Department of Information Technology is taking several steps to make PCs affordable for the masses. The Department is also taking steps to popularise local language tools since PC penetration as well as Internet coverage is critically dependent on local language content being made available. The Department has an ambitious plan of setting up 1,00,000 Common Service Centres (CSCs) spread all over the country for the benefits of e-governance and other services to reach the common man. The importance of creating local/rural content to make PCs and Internet an attractive proposition to a much larger number of people is well recognised. Involving the private sector in this regard would also be essential. Therefore, it is felt that a new entrepreneurial category of Rural Content Providers (RCPs) would give a further boost to and drive the demand both for PCs and Internet access as well as for rural connectivity. It will also help in better utilisation of the cable/ wireless network already laid, or being planned in the rural areas by the Bandwidth Providers.

9.8 The issue that needs to be examined is how to encourage this new category of Rural Content Provider. The Rural Content Provider would provide content and other facilities, including entertainment, which will be of interest to the rural population. Content creation would be a specialised area requiring thorough understanding of the local requirements and language which can only be done through local entrepreneurs. The business model of such an RCP would vary from region to region and would be driven by the market. The department of IT and the Department of Telecommunications need to evolve a suitable policy framework which would encourage such RCPs. The existing incumbent access providers should look upon these RCPs as engines to push faster and deeper penetration of the market for their mutual economic benefit.

## **10. ROAD MAP FOR DIGITISATION**

### **10.1 Broadcasting sector:**

Prasar Bharati to workout its roll out plan for Delhi going digital by 2010, in all other metros by 2011 and rest of the country by 2013.

- Introduction of HDTV in a phased manner starting from Delhi (2008-09) and extending it to all the six mega cities and coverage of Commonwealth Games in HDTV format in 2010.

- Digitisation of archives by Prasar Bharati
- Create subject specific content servers for providing content on demand
- Content creators and aggregators must provide free to air channels as well as provide feed to all cable operators on demand.
- Rationalise the charges of providing content to the consumers on a-la carte basis on cable.

### **10.2 Cable Operators**

- Change present system of charging from bouquet of channels to a-la carte of channel.
- Roll out of CAS to be tied up with digitalization
- Course ware and training of cable operators for migrating to digital era and provide services
- Cable industry to be recognized as an infrastructure industry similar to telecom

### **10.3 Industry**

- Production of digital receivers and STB to be synchronized with the roll out Plan
- Provide Incentives to the industry for going digital

### **10.4 Regulatory Issues**

The regulatory issues relating to Going Digital would be covered in a supplementary report after due consultation with all stakeholders.

## **11. MAJOR RECOMMENDATIONS ARRIVED AT THE MEETING OF THE SUB GROUP ON GOING DIGITAL**

11.1 Various issues related to all the stake holders have been discussed. The most important one being the recognition of a schedule and date for switching over to digital mode of transmission coupled with period of simulcasting and the cut-off date for the analogue transmission. It was decided that to keep the transition costs to the minimum, the switching over time as well as the simulcasting period should be kept to the minimum. It was recommended that a phased approach

should be taken for going digital. In the first phase, cover all the seven mega cities by 2011 and rest of the country by 2013. In the context of the Commonwealth Games being held in Delhi in 2010, we could synchronize the launch of DTT services with a slogan **Digital Delhi by 2010**. Major recommendations of the sub group are as follows:

## 11.2 Decisions related to Migration from Analogue to Digital Broadcasting

Laying down the **migration path for migration from analogue transmission to digital domain**, Member Secretary suggested an eleven stage process.

- i. Testing, publication and adoption of technical standard for digital terrestrial transmission.
- ii. Publication and adoption of national standards for digital cable television.
- iii. Prasar Bharati's roll out of transmission conversion from analogue terrestrial to digital terrestrial both for radio (AIR) and Doordarshan (DD).
- iv. Introduction of addressability and conditional access system in cable and satellite TV environment.
- v. Road map and commencement of indigenous production of STBs containing features such as (a) digital analogue convertors for delivery of digital signal at subscribers' end and (b) conditional access and addressability features.
- vi. Publication and adoption of national digital television standards for manufacture of digital receivers.
- vii. Commencement of indigenous production of digital receivers.
- viii. Commencement of digital terrestrial broadcast in selected cities by Prasar Bharati.

|      |          |                                 |       |
|------|----------|---------------------------------|-------|
| i.   | Step I   | - Delhi                         | -2010 |
| ii.  | Step II  | - All mega cities               | -2011 |
| iii. | Step III | - All Tier II & Tier III cities | -2012 |
| iv.  | Step IV  | - All other areas               | -2013 |

- ix. Commencement of HDTV broadcast for Commonwealth Games 2010 by Prasar Bharati.
- x. Commencements of digital signal delivery at subscribers end in Cable and Satellite (C & S) homes.
- xi. Nationwide switch off of analogue broadcast both for terrestrial and C & S homes (2015).

11.3 Secretary M/o I & B, has welcomed the initiative and has suggested looking into the road map prepared by various countries in their move towards digitalization so that the intermediate steps are well understood and we can prepare our initiatives accordingly. Member Secretary suggested that Prasar Bharati along with the Indian Broadcasting Foundation (IBF) should look into this aspect and come out with a paper for circulation.

11.4 It was also agreed that a group chaired by CEO Prasar Bharati who is also Chairman of Indian Broadcasting Foundation and some private broadcasters viz. Star, Zee, Sony, Eenadu etc. and their major MSOs will examine the above eleven stage process and firm up their sequencing and put the entire process on a “**digital upgrade timeline**”. Ideally the migration process must commence from Delhi in 2010, coinciding with Commonwealth Games and proceed to other mega cities by 2011 and Tier II and Tier III cities by 2012. In non-urban areas simulcast can continue for few more years. Analogue transmission should be completely phased out by 2015 as the outer limit.

11.5 All the content producers – Prasar Bharati as well as private operators to provide agreed and identified channels in the digital / HDTV format to MSO / cable operators under “Must Carry” clause.

11.6 Introduction of HDTV in a phased manner starting from Delhi (2008-09) and extending it to all the six mega cities and coverage of Commonwealth Games in HDTV format in 2010.

11.7 Mo I&B, private broadcasters and service providers along with department of Telecommunications (WPC cell) need to work in a coordinated manner to identify spectrum requirements keeping their rollout plans so that

spectrum planning could be proactively made. A Spectrum Management Group could be set up to achieve this.

11.8 Prasar Bharati to work out the financial implications of going digital covering AIR and Doordarshan operations and submit the same to Planning Commission.

11.9 The suggestion received from cable operators' association regarding training manpower in technical /vocational institutions is useful and relevant. The association may develop the requirements and indicate the facilitation in terms of accreditation of relevant courses necessary and provided them to Mo I&B for follow up by them with MHRD.

#### 11.10 **Decision related to non-broadcasting issues**

11.11 Amend the Cinematograph Act 1952 for inclusion of Digital Cinema.

11.12 Digital Cinema should be seen as a means of securing IPR of the film producer. Digitally recorded content taken from satellite in an encrypted conduit, provides a failsafe method of delivering films to exhibitors directly, without intermediary or distributor's interface at multiple locations simultaneously, in streaming audio-video-mode. This is the best guarantee against piracy. Digital Cinema should, therefore, be encouraged by recourse to various fiscal and non fiscal incentives.

11.13 Production of cinema in digital format could be on lower tax regime and the theaters which have installed digital cinema exhibition facilities can be subjected to say lower entertainment tax. This would need to be taken up with State Governments.

11.14 Prasar Bharati to digitally archive all its contents including educational contents for providing them for distribution streaming audio-video technologies. Prasar Bharati may also workout a mechanism to leverage the rich content available by appropriately pricing them and retailing them. All Prasar Bharati content of Classics or Fiction should be made web accessible with premium content

accessible through payment gateway. Public Service Broadcasting content should be freely accessible on web.

11.15 All conditional access devices (and Set Top Boxes) should be built on common standards for inter-operability, so that customers are not put to inconvenience. This will also help in better absorption, acceptability of digital technology. The plain-vanilla-STB should lend itself to modular insertion of proprietary data to include value-added services.

11.16 Content providers should be encouraged to work on creation of domain specific server farms and data depositories. The concept of digital libraries promoted by the Department of Information & Technology should also be publicly made available. Create open access platforms like Google libraries and others should also be encouraged. Memory modules, could specially be created for lawyers, doctors, accountants and other professionals for instant data mining and retrieval in respect of their domain.

11.17 Triple play services riding on entertainment related applications would be able to create the most viable business models for spread of rural connectivity. Applications of Wi Max technology will allow entertainment to rural areas and this will provide Ubiquitous Broadband experience to rural areas. Just as Wi Fi band has been delicensed, we need to move to the next step in encouraging proliferation of Wi Max technology for which the Wi Max band (2.5 GHz / 3.5 GHz / 700 MHz or existing Wi Fi band 2.4 – 2.48 GHz) could be delicensed for rural connectivity.

11.18 Content creation would be a specialised area requiring thorough understanding of the local requirements and language which can only be done through local entrepreneurs. The Rural Content Provider (RCP) would provide content and other facilities, including entertainment, which will be of interest to the rural population. Delivery of services could be through home TV or Mobile telephone. The business model of such an RCP would vary from region to region and would be driven by the market. The department of IT and the Department of Telecommunications need to evolve a suitable policy framework which would encourage such RCPs.

11.19 Department of Information & Technology/National Informatics Centre should work out a comprehensive plan for rollout of Statewise, regionwise and citiwise GIS database and encourage private enterprise to do customized applications and value addition for various public sector as well as private sector applications.

11.20 There is a need for convergence in regulation in the light of developments in technology and the M/o I & B is requested to take a fresh look at the proposal for having a common communications convergence regulator with separate bureaus under it for dealing with content and carriage. A supplementary report will be submitted with regard to regulatory issues relating to going digital.



**No. M-13040/8/2006-C&I  
Government of India  
Planning Commission  
(C&I Division)**

**Subject:- Minutes of the First meeting of the Sub Group on “Going Digital” held under the Chairmanship of Member Secretary, Planning Commission on 5.4.06.**

List of Participants is placed at Annexure-‘A’.

Member Secretary, Planning Commission, opened the meeting with the suggestion that Going Digital was one of the important issues under consideration of the Committee on Information, Communication and Entertainment (ICE). India, taking note of international trends in digital broadcasting, should set a date for going digital, clearly delineating the dates of initiating the process, completion and switching off the analog transmitters.

2. Adviser (C&I), then, briefed the Group that the mandate of the ICE committee was to draw a road map for going digital taking into account the global trends before 2015. This would require:

a. Working out the infrastructural needs for shifting from analog to digital mode, converting existing analog terrestrial transmitters, production facilities and last mile connectivity issues.

b. Investment required converting the analog transmission into digital one. The real concerns are pricing and availability of the digital TVs /radio receiver sets.

c. Issues related to regulatory frame work - regulatory frame work has to be put in place to regulate content, and spectrum trading.

d. Incentives required to be provided to the industries to expedite the pace of transition.

3. It was agreed that this meeting will confine itself to digital broadcasting and in this context he highlighted the target dates fixed by different countries for going

digital. Member Secretary pointed out that Prasar Bharati has to look into its infrastructural conversion needs for converting analogue terrestrial transmitters and studio facilities. We need to go into details of additional bandwidth required during the simulcasting period and we also need to go into the question of spectrum trading after the completion of digitalization.

4. Member Secretary said that viewed in a wider sense digitalization encompasses domains far wider than broadcasting. Therefore, in the next meeting, some members were requested to make presentations covering various related issues, such as “digital data transmission”, “digital archiving”, “digital films and music libraries”, “digitally cache’d content”, “domain specific data servers” etc.

5. The status of Prasar Bharati and its preparedness for going digital has been highlighted by the CEO Prasar Bharati, who has said that they are ready to take on the roll out date and work towards its implementation.

6. President NASSCOM asserted that India, unlike other developing countries is better prepared for shifting to digital mode. He added that it is crucial to cut down on the cost of transition by shortening the period of migration and simulcasting. The longer the period of transition, he added, higher would be the costs due to investments required and also the cost at the consumers end.

7. It was suggested that for going digital, India should achieve the target in two stages say all mega cities by 2010 and rest of the country by 2015. He said with the advent of convergence in devices, it would make better logic to provide content which will be acceptable on all kinds of devices. CAS should be integrated with digital STB, which will bring in common standard for convergence.

8. Chairman, CII Entertainment Committee, spoke on the need for having a common regulatory forum for ICE sector covering regulatory laws concerning both content as well as carriage. Convergence law is important and will help in moving towards a digital world. The ministry of I&B needs to play an angel role here in implementation of the convergence law. Intellectual Property Rights, copy right laws are also a major issue, which need to be addressed especially in the light of digital archiving of the content. Member Secretary suggested that NASSCOM, CII and FICCI could jointly look at the existing laws and workout the amendments required to be made. The report would be circulated to all for discussions and finalization in the next meeting. Member Secretary also pointed out that enforcement of IPR becomes

easier since digitally transmitted and stored content can be secured against unauthorized access by password protection and digital signature.

9. He said affordability of the digital delivery system to the poor, who may be deprived of the present system, is a concern and this should not lead to furthering the digital divide. Government should come out with a policy relating to the pricing of digital handheld and desktop devices. There was also a suggestion that in view of the rapid technological shifts more as a policy matter, there should be a strategy for education, capacity building for creating entire chain of skills and structures required for carrying out the digitalization process. Whereas this would make the shift to digital mode smooth, the pricing policy would take care of smooth adjustment of demand and supply of transmitters, set top boxes, digital-analogue converters, and other related goods and services, so that profiteering is prevented.

10. He also indicated that normally industry is slow in its response to adopting new technologies due to the prevalent mindset of not putting anything at stake until investment takes place in the forward and backward linked industries and activities. Therefore, there is a need for government playing a big role and make investment through its PSUs like BEL to provide the needed equipments at the initial stage, which will kick start the rollout as well as check the prices. Member Secretary, Planning Commission, viewed that Min. of I&B and Deptt. of Telecommunication could play a role in this connection.

11. Chairman, FICCI Entertainment Committee, pointed out that the sub-group should consider inclusion of stakeholders such as Google and Microsoft who are pioneers of virtualization, digital data, its delivery and also TRAI. He supported the view that India should go digital by 2010 and suggested adopting a slogan '**Digital Delhi by 2010**'.

12. President Cable Operators' Association sighted that the reason for failure of CAS was not because of non-availability of set-top boxes; rather it was because of absence of transparent pricing policy. Ultimately, consumers should have the right to choose the bouquet of channels they want to view and ala-carte pricing should be adopted instead of bouquet pricing being followed now. She also opined that in view of new technologies being introduced, training of cable operators would be highly desirable. Also to ensure availability of technical manpower, cable operation related training modules be introduced in technical schools and vocational training institutes. Financial help, she added, to the cable operators should be provided to enable them

to move to the digitalization smoothly, especially in the case of rural operators. As far as adoption of CAS, the cable operators favor it due to its transparency.

13. Executive Director MAIT pointed out that initially set top boxes or STBs were imported from China and now the industry has prepared a roadmap for manufacturing STBs indigenously and should also move to indigenous manufacture of digital receivers. He also asserted that the date of transition should be as early as possible to minimize the transition costs.

14. President, Public Service Broadcasting Trust highlighted the need for having an open platform digital content access system with regard to such public interest areas as libraries, learning institutions, etc. It was pointed out that two such platforms already exist viz. (a) the Universal Digital Library of DIT & (b) DTH platform of Doordarshan, which could very effectively be used for dedicated domain-specific channel carrying digital content from whatever the source, if it seeks to be placed in public domain.

15. Consumers are the primary stake holders in this entire exercise and their affordability needs to be taken into account while deciding the pricing of various elements of digitization activity. Consumer preferences would be the drivers for new services which can be provided on the DTT/or DTH mode.

### **Decisions related to Migration from Analogue to Digital Broadcasting**

1. Laying down the **migration path for migration from analogue transmission to digital domain**, Member Secretary suggested a ten stage process.
  - i. Testing, publication and adoption of technical standard for digital terrestrial transmission.
  - ii. Publication and adoption of national standards for digital cable television.
  - iii. Prasar Bharati's roll out of transmission conversion from analogue terrestrial to digital terrestrial both for radio (AIR) and Doordarshan (DD).
  - iv. Introduction of addressability and conditional access system in cable and satellite TV environment.
  - v. Road map and commencement of indigenous production of STBs containing features such as (a) digital analogue convertors for delivery of digital signal at subscribers' end and (b) conditional access and addressability features.

- vi. Publication and adoption of national digital television standards for manufacture of digital receivers.
- vii. Commencement of indigenous production of digital receivers.
- viii. Commencement of digital terrestrial broadcast in selected cities by Prasar Bharati.
  - Step I - Delhi
  - Step II - All mega cities
  - Step III - All Tier II & Tier III cities
  - Step IV - All existing DD States
- xii. Commencement of HDTV broadcast for Commonwealth Games 2010 by Prasar Bharati.
- xiii. Commencement of digital signal delivery at subscribers end in cable and satellite (C & S) homes.
- xiv. Nationwide switch off of analogue broadcast both for terrestrial and C&S homes.

2. Secretary M/O I & B, has welcomed the initiative and has suggested looking into the road map prepared by various countries in their move towards digitalization so that the intermediate steps are well understood and we can prepare our initiatives accordingly. Member Secretary suggested that Prasar Bharati along with the Indian Broadcasting Foundation (IBF) should look into this aspect and come out with a paper for circulation to all the members.

3. It was also agreed that a group chaired by CEO Prasar Bharati who is also Chairman of Indian Broadcasting Foundation and some private broadcasters viz. Star, Zee, Sony, Eenadu etc. and their major MSOs will examine the above 9 stage process and suggest their sequencing and put them on a “**digital upgrade timeline**”. Ideally the migration process must commence from Delhi in 2010, coinciding with Commonwealth Games and proceed to other megacities by 2011 and Tier II and Tier III cities by 2012. In non-urban areas simulcast can continue for few more years. Analogue transmission should be completely phased out by 2015 as the outer limit.

### **Decision related to non-broadcasting issues**

1. NASSCOM, CII and FICCI should jointly workout the regulatory and legal

issues which are required to be addressed and suggest an action plan for enacting a common regulatory framework and submit their report by 20<sup>th</sup> April 2006.

*(Action: NASSCOM)*

2. There is a need for convergence in regulation in light of developments in technology and the M/o I & B is requested to take a fresh look at the proposal for having a common communications convergence regulator with separate bureaus under it for dealing with content and carriage.

*(Action: Mo I&B)*

3. Prasar Bharati to work out the financial implications of going digital covering AIR and Doordarshan operations and submit the same to Planning Commission by 20<sup>th</sup> April 2006.

*(Action: Prasar Bharati)*

4. The suggestion received from cable operators' association regarding training manpower in technical /vocational institutions is useful and relevant. The association may develop the requirements and indicate the facilitation interms of accreditation of relevant courses necessary and provided them to Mo I&B for follow up by them with MHRD.

*(Action: Cable Operators Association, M/O I & B)*

5. Prasar Bharati to digitally archive all its contents including educational contents for providing them through streaming audio-video technologies. Also workout a mechanism to leverage the rich content available by appropriately pricing them and retailing them.

*(Action: Prasar Bharati)*

6. All access devises should be built on common standards for inter-operability and for protection of IPR of content, so that customers are not put to inconvenience. This will also help in better absorption, acceptability of digital technology.

*(Action: Mo I&B& Industry Associations)*

7. Content providers should work on creation of domain specific server farms and data depository. The concept of digital library promoted by the Department of Information & Technology should also be publicly made available. Create open access platforms like Google libraries and others should also be encouraged.

*(Action: DIT and Mo I&B)*

**Member who attended the meeting of the Sub Group on Going Digital held on  
5<sup>th</sup> April, 2006 at 3.00 PM.**

| <b>S N</b> | <b>Name &amp; Designation</b>  |
|------------|--|
| 1.         | Shri Rajeeva Ratna Shah, Member Secretary, Planning Commission<br>In the Chair                                       |
| 2.         | Dr. J. S. Sarma, Secretary, DOT  |
| 3.         | Shri S. K. Arora, Secretary, M/O I & B   |
| 4.         | Shri S. K. Sarma, CEO Prasar Bharati   |
| 5.         | Shri P. K. Garg, Wireless Advisor, DOT   |
| 6.         | Shri Amit Agrawal, Dy. Secretary, PMO  |
| 7.         | Shri Kiran Karnik, President, NASSCOM  |
| 8.         | Shri Anoop Kumar, President, CETMA   |
| 9.         | Shri Kunal Dasgupta, Co-chairman, FICCI Entertainment Committee & CEO,<br>SONY                                       |
| 10.        | Shri Bobby Bedi, Chairman, CII Entertainment Committee;<br>Chairman, Film & Television Producers Guild of India Ltd. |
| 11.        | Shri Vinne Mehta ED, MAIT  |
| 12.        | Shri Sanjay Diwedi, President-ISP Association of India   |
| 13.        | Smt. Roop Sharma, President, Cable TV Operators Association  |
| 14.        | Shri Rajiv Mehrotra, Managing Trustee, Public Service Broadcasting Trust   |
| 15.        | Shri Virat Bhatia, AT&T Communications services  |
| 16.        | Shri Sameer Rao, VP-Strategy, Planning & Regulatory, STAR India Pvt. Ltd.,   |
| 17.        | Dr. C. Muralikrishna Kumar Adviser (C&I), Planning Commission  |

PRASAR BHARATI  
DIRECTORATE GENERAL: DOORDARSHAN  
DOORDARSHAN BHAWAN  
NEW DELHI: 110 001


No. 7(16)/ 2006-07/ EVI/TV /Budget

Dated: 23.06.2006

**Subject: Projection of capital requirement for migrating from analog transmission to digital domain.**

This is in continuation of this Directorate letter of even no. dated 12.6.2006.

The funds requirement migrating from analog transmission to digital domain during 2007-2015 is Rs. 3531.00 crore (Annexure – A). The fund requirement during 2016-20 is Rs. 352.65 crore (Annexure – B).

  
(A.K. Maheshwari)  
Director (Engg.)

✓ Encl.: As above

To  
Smt. Krishna Tyagi  
GM (Budget)  
Prasar Bharati  
PTI building  
New Delhi

Copy to:

ADG(Finance), DG: DD, New Delhi



*Signature*

Annexure - A

| Capital funds requirement for migrating from analog transmission to digital domain during 2007-15 |  |         |               |         |               |           |               |         |               |       |               |                              |        |         |
|---|--|---------|---------------|---------|---------------|-----------|---------------|---------|---------------|-------|---------------|------------------------------|--------|---------|
| (Rs. In crore)  |  |         |               |         |               |           |               |         |               |       |               |                              |        |         |
| Sl. No.   | Activity   | 2007-08 | 2008-09       | 2009-10 | 2010-2011     | 2011-2012 | 2012-13       | 2013-14 | 2014-15       | Total |               |                              |        |         |
|   |  | No.     | Cost Involved | No.     | Cost Involved | No.       | Cost Involved | No.     | Cost Involved | No.   | Cost Involved | Cost Involved during 2007-15 |        |         |
| <b>11th Plan</b>  |  |         |               |         |               |           |               |         |               |       |               |                              |        |         |
| <b>Replacement by DTT</b>   |  |         |               |         |               |           |               |         |               |       |               |                              |        |         |
| A   | HPT  |         |               | 25      | 100.00        | 25        | 100.00        | 22      | 88.00         | 28    | 112.00        | 5                            | 20.00  | 292.70  |
|   | LPT  |         |               |         |               | 65        | 52.00         | 55      | 52.00         | 75    | 60.00         | 70                           | 58.00  | 165.80  |
|   | VLPT   |         |               |         |               |           |               | 40      | 30.00         | 50    | 37.50         | 50                           | 37.50  | 189.50  |
|   | Total of A   |         | 0.00          |         | 100.00        |           | 152.00        |         | 162.00        |       | 178.00        |                              | 205.50 | 649.00  |
| B   | DVS-H  | 7       | 28.00         |         |               |           |               |         |               |       |               |                              |        | 28.00   |
| <b>Beyond 11th Plan</b>   |  |         |               |         |               |           |               |         |               |       |               |                              |        |         |
| C   | HPT  | 2       | 9.70          | 30      | 100.50        | 30        | 99.00         | 25      | 83.50         |       |               |                              |        | 292.70  |
|   | LPT  | 100     | 60.00         | 100     | 60.00         | 78        | 45.80         |         |               |       |               |                              |        | 165.80  |
|   | VLPT   | 150     | 75.00         | 120     | 60.00         | 109       | 54.50         |         |               |       |               |                              |        | 189.50  |
|   | Total of C   |         | 144.70        |         | 220.50        |           | 200.30        |         | 93.50         |       |               |                              |        | 649.00  |
| D   | Digitalisation and replacement of studio equipment   |         | 130.00        |         | 150.00        |           | 150.00        |         | 150.00        |       | 120.00        |                              | 120.00 | 1110.00 |
|   | Digitalisation and replacement of satellite broadcast equipment including enhancement of channels of DTH |         | 120.00        |         | 88.00         |           | 92.00         |         | 70.00         |       | 60.00         |                              | 102.00 | 750.00  |
| G. Total  |  |         | 442.70        |         | 568.50        |           | 594.30        |         | 455.50        |       | 378.00        |                              | 427.50 | 345.50  |
|   |  |         |               |         |               |           |               |         |               |       | 328.00        | 3531.00                      |        |         |

## APPENDIX C

Option IV

Digitalization, Multi-media services, 100% FM, Strengthening of External Services, 5 SW channels nationwide (Rs. 5900crores)

Besides replacement of equipment, following additional things are proposed :-

**1. Strengthening of IT services for e-governance:-**

At present, stand-alone systems at major centres with limited or no connectivity are available.

It is proposed to strengthen IT infrastructure for e-governance in areas like project management, inventory management, project planning, disaster recovery solution, Enterprise Resource Planning (ERP) etc.

**2. Networking of Stations:**

At present, 28 AIR stations are equipped with uplinking facility to facilitate programme exchange. It is proposed to provide networking at all stations.

**3. Extension of coverage in uncovered pockets:-**

In order to provide coverage in uncovered areas and pockets having poor signal 50 numbers of Low Power FM Transmitters are proposed to be set up at various locations during 10<sup>th</sup> Plan.

It is proposed to provide about 1000 numbers of 100 W FM Transmitters in such pockets during next 10 years.

**4. Expansion of FM Coverage to near 100% of population :-**

At present, 33% of population of the country is getting coverage by FM signal. It is proposed to increase FM coverage to near 100% of population by additional 360 FM Transmitters. Some of these transmitters will be near

the border areas in J&K and North East Region and would extend coverage across the border also. Total number of FM transmitters would become 510.

#### 5. SW DRM – 5 channels (Nationwide)

At present, there is no nationwide service available. It is proposed to introduce five channels of SW-DRM (Digital Radio Mondiale) compatible transmitters for nationwide coverage. It is mentioned that these transmitters would give near FM quality signal. One of the channel would carry news and current events programme.

#### 6. Automation/Digitalization of studios :-

At present part digitalization (with Hard Disk Based System) have been provided at 100 centres. It is proposed to provide full digitalization along with disaster recovery software and remote management of stations (220 centres) from central location.

#### 7. Strengthening of External Services :-

At present, there is no dedicated 24 hour external service to provide coverage in foreign countries and also there is no coverage in American continents. It is proposed to hire airtime on FM transmitters in Gulf countries for dedicated 24 hour service. Similarly to cover American continents, airtime would be hired on satellite. The External Services will be put on SW-DRM mode. For dedicated services, augmentation of programme production facilities, programme feeding links etc would also be necessary.

#### 8. Direct Satellite Broadcasting and multi-media Services :-

Nowadays multi-media services are becoming popular in bigger cities. At present, these services are not provided by AIR. It is proposed to introduce multi-media service both in terrestrial and satellite mode.

| Sl. No. | Item Details  | Estimated amount (Rs. In crores) | Remarks   |
|---------|---|----------------------------------|---|
| 1       | Replacement of existing MW, SW & FM Transmitters  | 1100                             |   |
| 2       | Replacement of STL  | 40                               |   |
| 3       | Replacement of studio equipment   | 200                              |   |
| 4       | Automation/Digitalisation of RNUs   | 50                               |   |
| 5       | Strengthening of IT services for e-governance   | 100                              | Existing-stand alone systems at major centres with limited connectivity<br>Proposed-Strengthening of Infrastructure for e-governance(project management, inventory management, stores, disaster recovery solution,ERP etc.) |
| 6       | Networking of stations  | 130                              | Existing - Only uplink facility at 23 centres<br>Proposed – Networking of all stations(220 centres)   |
| 7       | Extension of coverage in uncovered pockets  | 100                              | Existing – 50 nos. of 100 W FM Trs. (after 10th Plan)<br>Proposed – 1000 nos. of 100 W FM Trs.  |
| 8       | Expansion of FM Coverage to 100% of Population<br>(i) Hill-top transmitters<br>(ii) Psy-war proposals<br>(vii) Special J&K Phase –II<br>(viii) Installation of 150 new transmitters at important places | 2200                             | Existing - 33% FM coverage by 150 FM transmitters<br>Proposed – Near 100% FM coverage by about 360 additional FM Trs. Total no. of FM Trs. would become 510.  |



|    |   |             |  |  |
|----|---|-------------|--|--|
|    | (V)<br>(VI)<br>Power back-up at important places<br>Installation of 150 new transmitters at<br>other places mostly in rural areas |             |  |  |
| 9  | SW/DRM – 5 channels (Nation wide)   | 200         | Existing - No nationwide channel<br>Proposed - 5 dedicated channels having<br>nationwide coverage  |  |
| 10 | Automation/ Digitalization of studios including<br>disaster recovery software   | 600         | Existing-Part digitalization(with Hard Disk<br>Based system) at 100 centres<br>Proposed- Full digitalization along with<br>major activity remotely controlled and<br>facilities for disaster recovery              |  |
| 11 | Strengthening of external services  | 300         | Existing – no dedicated 24 hrs channel/no<br>coverage in American continents.<br>Proposed – I, 5 dedicated channels in gulf<br>countries<br>ii. coverage in American continents by<br>hiring airtime on satellite. |  |
| 12 | Direct Satellite Broadcast & Multi media<br>services  | 150         | Existing – No direct satellite B'cast having<br>nationwide coverage.<br>Proposed – I. Direct satellite B'cast having<br>nationwide coverage<br>ii. Multimedia services from major cities<br>(about 100 centres)    |  |
| 13 | IOF/Misc. Schemes(including DTH)  | 340         |  |  |
|    | <b>Total</b>  | <b>5510</b> |  |  |
|    | <b>Non-recurring @ 7%</b>   | <b>386</b>  |  |  |
|    | <b>Grand Total:</b>   | <b>5896</b> |  |  |
|    | <b>Say</b>  | <b>5900</b> |  |  |

Note

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- i) Shaded schemes amounting to about Rs. 1400 crores are primarily commercial services.
- ii) Besides the replacement of transmitters for External Services (i.e. Rs. 200 crores), this proposal includes Rs. 300 crores for External Services
- iii) It may be mentioned that one of the SW-DRM channel would carry news and current events. This proposal includes about Rs. 90 crores for NSD
- iv) This proposal includes about Rs. 250 crores for transmitters in border areas

#### Financial :

In this scenario a minimum requirement for capital projects of Rs. 5853 (rounded off to Rs. 5900) would be required. This would help us in ensuring that technological gaps in AIR profile are filled up and the national Broadcaster is on the same 'wavelength' as National broadcasters of other countries.

Further with SW DRM, digitalization, automation and provision of a host of services including broadcasting, web-casting etc., All India Radio would be at par with other similar broadcasting organizations in the world

Therefore, in this model the growth of Revenue expenditure is assessed at a rate of 10% to cover for power supply, content and minimum cost establishments.

**Thus incremental revenue generation addition is suggested initially. However, revenues for these services will pick up from the 5<sup>th</sup>/6<sup>th</sup> year. Thus, at the end of the 10<sup>th</sup> year, an additional revenue generation of Rs. 888crore per year over Option I is envisaged in the terminal year of the 10<sup>th</sup> year period.**

It is also to be kept in view that with the licensing of private FMs, additional private operators will come who will compete for the same pie of revenue.

This scenario is the best scenario not only for progressive revenue earnings but would also boost technological gaps.

The items shown in dark are the items which will only earn us commercial revenue which entail an expenditure of Rs. 1400 crores for the 10<sup>th</sup> year period(including up to Rs. 985 crores envisaged for Option III). The commensurate additional earnings would off-set the cost of these items.

The revenue is expected to start flowing from the 2<sup>nd</sup>/3<sup>rd</sup> year keeping in view the gestation period as well as the period for grounding of the project.

#### Apportionment of Total Capital Costs

|                                  |                        |
|----------------------------------|------------------------|
| Costs to be funded by Government | Rs. 4500 crores        |
| Cost of Commercial Services      | Rs. 1400 crores        |
| <b>Total cost</b>                | <b>Rs. 5900 crores</b> |

The apportionment of additional revenue in the items as above would be:

|  |     |
|--|-----|
| Hill top transmitters                    | 35% |
| SW DRM                                   | 20% |
| Direct Satellite Broadcast & Multi-media | 20% |
| New transmitters                         | 15% |
| Power back up                            | 10% |

**PHASING:**

| 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | Total |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| 200     | 225     | 300     | 375     | 480     | 600     | 720     | 860     | 970     | 1170    | 5900  |

| Option   | SCENA RIO | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | Total |
|----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Option 4 | Revenue   | 175     | 225     | 285     | 450     | 550     | 650     | 750     | 850     | 950     | 1180    | 6065  |
|          | Gen.      |         |         |         |         |         |         |         |         |         |         |       |
|          | Revenue   | 935     | 1019.15 | 1110.87 | 1210.85 | 1319.83 | 1438.61 | 1568.09 | 1709.22 | 1863.05 | 2030.72 | 14205 |
|          | Exp.      |         |         |         |         |         |         |         |         |         |         |       |