Calculation and Rationale for Carriage Fee Rate

In response to the Honorable Regulator's request for providing detailed calculation for the Carriage fee rate, we would like to offer the following justification.

Based on the Regulator's own assessment, the revised rate (Tariff Order CAS Third amendment on 26th December 2008) of Rs. 82/- per month per subscriber was fixed for a minimum 30 Free to Air (FTA) Channels in CAS areas. These 30 channels were being offered in the Analog mode.

In the DAS regime the MSO is required to offer a minimum of 100 FTA channels through a Digital Addressable System and the cost for providing these FTA channels would be much higher. We would like to use the above basis for explaining the cost of Carrying a channel.

Number of FTA Channels	Cost, Per month per subscriber
30 Channels (Unencrypted) in Analog (CAS)	Rs.82/-
100 Channels (Unencrypted) in Analog	Rs.273/- (On a pro-rata basis)
1 channel (Unencrypted) in Analog	Rs.2.73/- (Carrying cost of one channel)

Particulars	Cost, Per month per subscriber
Carrying cost of 1 unencrypted channel in Digital	Rs.2.73/-
Cost of Digital encrypted service for a channel (without Set Top Box cost)	Rs.0.68/-
Total Carrying cost of channel	**Rs.3.41/-**

From the above, it is clear that the cost of carriage per month per subscriber for a channel is more than the rate quoted by Digicable i.e. **Rs.2.50/**- per month per subscriber.

The key costs that Digicable has incurred and will incur while commissioning and managing its Digital Addressable System and delivery of DAS services are as mentioned below:

A. Headend & Support Infrastructure Cost

a. Establishment of Digital Headends with a mandated 500 channel capacity
b. Infrastructure & Equipment: Offices, encoders, modulators, multiplexers, UPS, Generators, Air conditioned facility, Fire prevention systems etc.
c. Installation of Conditional Access System (CAS) and Subscriber Management System (SMS)
d. CAS involves licenses fees, servers and other middleware costs
e. SMS involves Software license fees, database and application server costs
f. Both CAS and SMS needs a regular upgrade depending upon the system and service requirements

B. Distribution and Delivery Cost

a. Extremely high Right of Way (ROW), Optic fiber cost and fiber laying cost. Cost of Leasing of optic fiber in certain cases which is very expensive, especially for Tier 1 and Tier 2 cities ***(This is huge cost which the MSO has to bear but is not factored in our calculation)***
b. Cost of Switches and it's installation at distributor / LCO end for transport of Digital Service
c. Manpower cost for managing, supervising and executing the activation and deployment of STBs
d. Warehousing of Set Top Box (STB) and STB Activation centers for managing the deployment of a very large number of STBs

C. Service and other Costs

a. Setting up of a Call Centre
b. STB repair / service centre cost
c. Maintenance cost of all the above mentioned equipment and infrastructure
d. Subsidy on STBs
e. Interest cost on funds raised for Digitalization

For a further understanding, the costing for a 500 channel large scale and midscale headend is provided below.

	Large-scale HE		Mid-scale HE	
No. of Subs per Headend (Max)	500,000		100,000	
No. Subs per LCO (Max)	1,000		400	
No. of LCOs per Headend (Max)	500		250	
No. of Channels per Headend	500	250	500	250
Pay Channels SD (Powerkey)	30	20	30	20
Pay Channels SD (Others)	170	130	170	130
MPEG-4 FTA (SD) - Note 2	200	60	200	60
MPEG-2 FTA (SD) - Note 2	60	35	60	35
MPEG-4 HD	40	5	40	5
No. of Digital Frequencies (QAM64) - Note 1	50	23	50	23
Data bandwidth per QAM64 (Mbps)	38	38	38	38
Data B/w per Digital Headend (Mbps)	1,900	874	1,900	874
No. of Dish Antennae per HE	15	10	15	10
Digital Headend Capex				
Cost for Dish Antennae	750,000	500,000	750,000	500,000
IRDs for Pay Channels SD (Power-key)	5,467,500	1,620,000	5,467,500	1,620,000
IRDS for Pay Channels SD (Others)	18,360,000	-	18,360,000	-
Decoders for Pay Channels SD	-	3,900,000	-	3,900,000
IRDs for MPEG-4 SD FTA	9,450,000	2,835,000	9,450,000	2,835,000
IRDs MPEG-2 SD FTA	2,835,000	1,653,750	2,835,000	1,653,750
IRDs for MPEG4 HD	27,000,000	3,375,000	27,000,000	3,375,000
Encoders for SD Channels	93,150,000	9,922,500	93,150,000	9,922,500
Multiplexer w/ stat-muxing and scrambling	11,812,500	-	11,812,500	-
Multiplexer w/ scrambling	-	1,552,500	-	1,552,500
Switches, Cabling & Racks	5,000,000	2,000,000	5,000,000	2,000,000
Airconditioning	2,500,000	1,500,000	2,500,000	1,500,000
Uninterrupted Power Supply	3,000,000	1,800,000	3,000,000	1,800,000
Standby Generator	2,500,000	1,500,000	2,500,000	1,500,000
Digital Headend Cost (INR)	*181,825,000*	*32,158,750*	*181,825,000*	*32,158,750*
Distrubtion Capex (IP Ring)	10G IP Ring	1G IP Ring	10G IP Ring	1G IP Ring
L3 S/w + SFP Cost per HE (Pri-	10,260,000	2,132,000	6,360,000	1,172,000

ring)				
L3 S/w + SFP Cost (Sec-ring)	280,000,000	80,000,000	140,000,000	40,000,000
Signal Distribution Cost per HE (INR)	*290,260,000*	*82,132,000*	*146,360,000*	*41,172,000*
LCO-end Capex (MSO Cost)				
L3 S/w + SFP per LCO	920,000	280,000	920,000	280,000
Edge-QAM	810,000	303,750	810,000	303,750
Combiner + Amplifier	10,000	10,000	10,000	10,000
Fiber + Other Material Cost	200,000	200,000	100,000	100,000
Total Cost per LCO (by MSO)	1,940,000	793,750	1,840,000	693,750
Total Cost @ LCO-end per HE (INR) (by MSO)	*970,000,000*	*396,875,000*	*460,000,000*	*173,437,500*
Subsciber Management System (SMS)				
SMS Server Hardware	3,500,000	3,500,000	1,500,000	1,500,000
SMS Server Software	12,000,000	12,000,000	3,000,000	3,000,000
SMS Terminal Cost	6,250,000	6,250,000	3,125,000	3,125,000
SMS per Sub License	45,000,000	45,000,000	12,000,000	12,000,000
Customer Relationship Management (CRM)				
CRM Server Hardware	1,500,000	1,500,000	1,000,000	1,000,000
CRM Server Software	18,000,000	18,000,000	4,500,000	4,500,000
CRM Terminal Cost	1,250,000	1,250,000	250,000	250,000
CRM per Sub License	45,000,000	45,000,000	12,000,000	12,000,000
CRM Outsourcing Cost (5 Yrs)	84,000,000	84,000,000	21,000,000	21,000,000
Conditional Access System (CAS)				
CAS Manager Hardware	1,500,000	1,500,000	1,000,000	100,000
CAS Manager Software	9,000,000	9,000,000	3,000,000	3,000,000
CAS Scrambling Hardware	2,500,000	1,300,000	2,500,000	1,300,000
CAS Scrambling Software	6,000,000	1,500,000	6,000,000	1,500,000
CAS Scrambling per Service License	7,155,000	4,860,000	6,075,000	4,725,000
CAS per Sub License	120,000,000	120,000,000	24,000,000	24,000,000
DVB Service Information (SI)				
SI Server Hardware	500,000	200,000	500,000	200,000
SI Server Software	7,200,000	4,500,000	7,200,000	4,500,000
Network Management System (NMS)				
NMS Server Hardware	1,000,000	1,000,000	500,000	500,000
NMS Server Software	6,000,000	6,000,000	3,000,000	3,000,000
Per Channel NMS Monitor	16,875,000	8,437,500	16,875,000	8,437,500

Total Support Systems Cost (INR)	*394,230,000*	*374,797,500*	*129,025,000*	*109,637,500*
Total Digital Service Cost per HE (INR)	**1,836,315,000**	**885,963,250**	**917,210,000**	**356,405,750**
Total 5YR Service Cost w/ 20% AMC (INR)	*3,504,630,000*	*1,603,926,500*	*1,792,420,000*	*670,811,500*
Average 5YR Cost Per Channel (INR) (Does not include STB, Manpower, Office, Utilities, G&A, Bandwidth, Printing and Misc Expenses)		**6,713,000**		**3,135,000**
Per Month Cost of Carraige of Services (INR)	**112**	**56**	**261**	**131**
(Does not include Manpower, Office, Utilities, G&A, Bandwidth, Printing and Misc Expenses)				
Per Month Operating Expenditure (Opex)				
Office Rental	1,500,000	1,200,000	1,000,000	800,000
Utilities	800,000	600,000	800,000	600,000
General & Administrative (G&A) Expenses	1,000,000	800,000	600,000	500,000
Manpower Expenses	15,000,000	12,000,000	4,000,000	3,000,000
Bandwidth (10G & 1G) Costs	6,200,000	1,850,000	1,500,000	450,000
Bill Printing Per Month @ 0.75/Sub	375,000	375,000	75,000	75,000
Total Per Month Opex (INR)	*24,875,000*	*16,825,000*	*7,975,000*	*5,425,000*
Opex Amortisation per Sub per Month (INR)	49.75	33.65	79.75	54.25
Per Month Cost of Service w/ Opex (INR)	***161.65***	***89.65***	***341.05***	***184.95***
w/o Set-Top Box Cost				
Basic Set-top Box Landed Cost (INR)		1,350.00		1,350.00
5YR STB Cost w/ RMA @ 5%		1,687.50		1,687.50
Monthly Payback Towards STB Cost (INR)		28.13		28.13

Per Month Cost of Service w/ STB (INR)	**189.78**	**117.78**	**369.18**	**213.08**
LCO Capex per Sub (Lastmile)	1,000	1,000	1,000	1,000
Total Per LCO Capex	**1,000,000**	**1,000,000**	**400,000**	**400,000**

Note 1: 500 Channel H.E requires more data bandwidth for additional HD Channels, Event Info and CAS Entitlements.
Note 2: MPEG-2 FTA SD is expected to convert to MPEG-4, thereby reducing the current availability of 150 channels to 75 channels only.

The following assumptions have been utilized to derive the cost:

A. Usable frequencies spectrum after auction of 700MHz and above for BWA use = 400MHz (302 to 702MHz) = 50 Frequencies of 8MHz ea. Frequencies below 302MHz have been allocated in 7MHz bands by ITU, and therefore will require major re-programming or scrapping of the existing STB assets.
B. Stat-muxed head-end and 10Gps IP equipment utilized for delivery of 500 channel services.
C. Non stat-muxed head-end and 1Gps IP equipment utilized for delivery of 250 channel services.

D. Assumed that QAM64 modulation to be utilized in first 3 to 4 years of service deployment to omit the cost of network upgrades/maintenance to support QAM256 level of services.
E. Total usable bandwidth on a QAM64 frequency assumed to be 36.5Mbps of the total throughput of 38Mpbs.
F. 32Mpbs per QAM64 will be available as usable bandwidth for encrypted audio-video services.
G. 2MBps to be utilized for CAS (11 different processes) per QAM64 frequency to maintain SLAs.
H. 2MBps to be utilized for DVB Service Information (SI) per QAM64 frequency to deliver EPG and other SI tables.

I. 0.5Mbps to be kept vacant to provide headroom for managing contingencies.
J. Assumed 10Gbps and 1Gbps respective data-bandwidth requirement for 500 channel and 250 channel services.

K. Assumed five (5) 10Gbps and 1Gbps respective Primary IP distribution rings for Large-scale HE, and two (2) 10Gbps and 1Gbps respective Primary IP distribution rings for Mid-scale HE.

L. Assumed max five (5) LCOs serviced by the respective 10Gbps and 1Gbps Secondary IP distribution rings. Therefore, the Secondary IP ring infrastructure multiplied by factor "No. of LCOs/5" in each schema.

Digicable's carriage fee rate does not factor inflation which has been very high and is expected to remain so. At the same time the value of Indian Rupee has been depreciating significantly thereby impacting the cost of distribution hardware, software and its corresponding maintenance.

Thus, considering the above facts the rate of Rs.2.50 per month per subscriber per channel is strongly justified.