

By Speed Post/FAX

**PRASAR BHARTI (BCI)  
DIRECTORATE GENERAL: DOORDARSHAN  
DOORDARSHAN BHAVAN, COPERNICUS MARG,  
NEW DELHI – 110 001.**

F. No 14 (3) 2009-10-EI-P (TV)

Dt. 10.11.2009

To

M/s -----  
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**Subject:** SITC of C Band DSNG VAN.

Dear Sir,

The following enclosed Clarifications / Amendments are here by authorized. It may also be noted that the tender opening date for this subject tender has been extended. Now the tender will be opened on 10.12.2009 at 12:00 Hrs. The tender submission time will be upto 11:30 Hrs on 10.12.2009.

This is however without any commitment whatsoever at this stage.

Yours faithfully



**Preminder Singh  
(Assistant Engineer)  
For Director General  
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**Spec: No: SATD/ C-Band DSNG 2009**

Page	Item No.	Description	
1	5	2.2.2 Enc. HD MPEG.4	<b>Existing text</b> Low delay -
			<b>Query</b> We would recommend that you indicate the delay time as "300 msec".
			<b>Amended text</b> Low delay - 100 msec max
2	5	2.2.1.3(a)	<b>Existing text</b> Video Resolutions (PAL) - 1280/960/1080x1920/1440/1280/960 i 25 1080x1920/1440/1280/960i 29.97 720x1280/960/640p 50 720x1280/960/640p 59.94
			<b>Query</b> We would like you to delete 1280 / 960 from the specification.
			<b>Amended text</b> "Video Resolutions (PAL) - 1080x1920/1440/1280/960 i 25 1080x1920/1440/1280/960i 29.97
3	5	2.2.1.3(c)	<b>Existing text</b> (c)Video Bit-rate - 1.0 to 15 Mbps for 4:2:0 Profile.
			<b>Query</b> The specification specifies that the bit rate for 4:2:0 is to be 1.0 to 15 Mbps.For HD encoding, 1 Mbps is too low to maintain the picture quality, and we would like you to change it to 3 Mbps
			<b>Amended text</b> (c)Video Bit-rate - 3.0 to 15 Mbps for 4:2:0 Profile.
4	5	2.2.1	<b>Existing text</b> Video Input - The encoder shall be capable of accepting composite analog, SDI and embedded SDI inputs.
			<b>Query</b> why composite analog video is is required? In order to encoder HD content, the content itself has to be in HD format already to achieve the high definition quality, HD-SDI is the worldwide format used in all the HD broadcasters.
			<b>Amended text</b> Video Input - The encoder shall be capable of accepting HD SDI and embedded HD SDI inputs.
5	5	2.2.1.3(d)	<b>Existing text</b> (d) Temporal Processing - I, B, Br, B, P frames structure supported
			<b>Query</b> Our encoder Model HVE9100 does not support "Br" frame. We would like you to delete the "Br" from the specification. This is because of our encoder chip being used in our encoder. If the Br is referred instead of I picture, it can theoretically save the bit rate and allocate the saved bit for the encoding operation, though we have never verified it as our encoder is not capable in such operation.
			<b>Amended text</b> (d) Temporal Processing - to support low delay mode. (refer Sr no 1 above)
6	5	2.2.1.2 (e)	<b>Existing text</b> Return loss- better then 15 dB, 5 Mbps-1.5Gbit/s
			<b>Query</b> Return Loss - It should read as :- Better than 15 dB, 5 MHz to -1.5GHz instead of Mbps
			<b>Amended text</b> No change in Specifications
7	6	2.2.2.2 (a)	<b>Existing text</b> Blank
			<b>Query</b> SAMPLE Rate- The specs are missing. Should read as 48KHz instead of being blank
			<b>Amended text</b> SAMPLE Rate- 48KHz
8	6	2.2.2.4(a)	<b>Existing text</b> (a) Audio Encoding Method - MPEG1 layer 2, Dolby Digital(with capability for at least one 5.1surround sound encode) LC-AAC, HE-AAC V1,V2
			<b>Query</b> Audio encoding method- is Dolby Digital encoding required or pass through is sufficient?
			<b>Amended text</b> (a) Audio Encoding Method - MPEG1 layer 2, Digital LC-AAC, HE-AAC V1 (with capability for at least one 5.1surround sound encode)
9	6	2.2.2.4(a)	<b>Existing text</b> (a) Audio Encoding Method - MPEG1 layer 2, Dolby Digital(with capability for at least one 5.1surround sound encode) LC-AAC, HE-AAC V1,V2
			<b>Query</b> Our encoder Model HVE9100 does not support HE-AAC V2. We would like you to delete "V2" from the specification. Also, we do not support 5.1 surround encode for Dolby Digital, and we would like you to delete the "5.1 surround
			<b>Amended text</b> Refer SI. No. 8 above
10	7	2.1 SD Encoder	<b>Existing text</b> The system shall be designed to meet the international standards for digital broadcasting by satellite known as the MPEG-4 / DVB-S2 standards ( MP@ L3, 422P @ ML & MP@ ML, selectable without any hardware changes. It should be possible to provide programme specific information, service name, language description and other related routine data.
			<b>Query</b> Our encoder is capable for upgrading from SD to HD by firmware in the field withoutchanging the hardware if the additional fee is paid. Please add "Up-gradable to HD" in the specification.
			<b>Reply</b> No change in specification.
11	7	2.2.1.3(a) SD Encoder	<b>Existing text</b> (a) Video Resolutions (PAL)- 720 x 480, 720 x 576, 480 x 480, 352 x 480
			<b>Query</b> Our Encoder model HVE 9100 does not support "480 x 480 or 352 x 480" WE would like you to delete it from specification
			<b>Amended text</b> (a) Video Resolutions (PAL)- 720 x 480, 720 x 576,
12	7	2.2.1.2.(a)	<b>Existing text</b> SMPTE 259M, 270 Mb/s(10 bit) with embedded audio
			<b>Query</b> Serial Interface -Should it read as SMPTE 272M, 270Mbp/s (10bit) with embedded audio as 259M is for SDI input only.

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	Page	Item No.		Description
			Amended text	SMPTE 272M, 270 Mb/s(10 bit) with embedded audio
13	7	2.2.1.2 (e)	Existing text	better than 15 dB, 10 – 270 Mbps
			Query	Return Loss - It should read as :- Better than 15 dB, 10MHz to -270MHz instead of Mbps
			Reply	No Change in for specifications.
14	7	2.1	Existing text	Encoder
			Query	We propose Encoder with L-Band modulator
			Reply	No comments
15	7	2.1 SD Enc	Existing text	The system shall be designed to meet the international standards for digital broadcasting by satellite known as the MPEG-4 / DVB-S2 standards (MP@ L3, 422P @ ML & MP@ ML, selectable without any hardware changes.
			Query	SD Encoder is 4:2:2 profiles also required for the H.264 encoding or just for the MPEG-2 encoding?
			Amended text	4:2:2 is required for HD MPEG-4 (H.264) and SD MPEG-2. 4:2:0 is required for HD MPEG-4 (H.264) and SD MPEG-2 & MPEG 4( H.264)
16	8	2.2.1.3(d)	Existing text	Temporal Processing - I, B, Br, B, P frames structure for MPEG-4 I, B, B, P frames structure for MPEG-2
			Query	Our encoder Model HVE9100 does not support "Br" frame. We would like you to delete the "Br" from the specification.
			Amended text	(d) Temporal Processing - to support low delay mode. Refer SI. No. 5 above
17	8	2.2.2.1	Existing text	Analog Audio Input Specifications
			Query	Please remove "analog input" OR make optional
			Amended text	Analog input Specification stand deleted. (Please refer revised BOM for Sr No 6 (i) for Embedder and ADC.)
18	8	2.2.2.2(d) SD Encoder	Existing text	Digital Audio I/P specification Data Rate - 32-384kbps (MPEG-1, layer 2 Audio) 64-128 kbps ( MPEG-4 AAC Encoding) 48-128 kbps (MPEG-4 HE-AAC Encoding) 32-128 kbps (MPEG-4 HE-AAC V2 Encoding)
			Query	We would like you to change the data rate from "32 to 384Kbps" to "128 to 384kbps". For MPEG-4 HE-AAC, our encoder Model HVE9100 supports only from 64kbps. We would like you to change the data rate from "48 to 128kbps" to "64 to 128kbps". MPEG-4 HE-AAC V2 is not supported by our encoder Model HVE9100, we would like you to delete this specification.
			Amended text	Data Rate - 64-256 kbps (MPEG-1, layer 2 Audio) 64-128 kbps ( MPEG-4 AAC Encoding) 48-128 kbps (MPEG-4 HE-AAC Encoding)
19	8	2.2.2.4(a)	Existing text	(a) Audio Encoding Method - MPEG1 layer 2, Dolby Digital with capability for at least one 5.1surround sound encode) LC-AAC, HE-AAC V1,V2
			Query	Please make as "Dolby Digital (with capability for at least one 5.1 surround sound encode) LC-AAC, HE-AAC V1, V2. OR "AAC 5.1"
			Query	Our encoder Model HVE9100 does not support HE-AAC V2. We would like you to delete "V2" from the specification.
			Amended text	(a) Audio Encoding Method - MPEG1 layer 2, (with capability for at least one 5.1surround sound encode) LC-AAC, HE-AAC V1
20	8	2.2.1.3 (c)	Existing text	1 to 10 Mbps for 4:2:0 Profile. 1 to 25 Mbps for 4:2:2 Profile.
			Query	Video Bit-rate- For more clarity should it not be specified as :- 1-15 Mbps, MPEG 2 420 1-50 Mbps, MPEG 2 422 0.25 -10 Mbps MP@L3
			Reply	No change in specification.
21	8	2.2.1.3 (g)	Existing text	4:2:2 as well as 4:2:0 (selectable)
			Query	Chrominance Format- For clarity it may be specified as:- MPEG -2, 4:2:0 & 422 selectable MPEG-4, 4:2:0 Only
			Amended text	For MPEG -2, 4:2:0 & 4:2:2 selectable, For MPEG-4, 4:2:0 Only
22	8	2.2.2.2 (d)	Existing text	32-384kbps (MPEG-1, layer 2 Audio) 64-128 kbps ( MPEG-4 AAC Encoding) 48-128 kbps (MPEG-4 HE-AAC Encoding) 32-128 kbps (MPEG-4 HE-AAC V2 Encoding)
			Query	Should read as 32Kbps for MPEG4 HE -AAC V2 encoding HEAAC v2 standards specify 32Kbps only as this is meant for hand held devices. When bit rates are set on the encoder above 32kbps then the audio is automatically formatted in HE-AAC
			Amended text	(d) Data rate: Refer SI. No 18
23	8	2.2.3.2 (a)	Existing text	Synchronous Serial Data Input Specifications (Optional)
			Query	Synchronous Serial Data Input Specifications (b) RS422 interface is mentioned this is an old and obsolete specification. MPE is now suggestion (for both encoding and receiving application).
			Reply	9 Pin D type or MPE connector
24	8	2.3.2(d)	Existing text	(d) Transmission Rates - Variable, 1.0 to 35 M symbols / sec

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Page	Item No.	Description
		<p>Query</p> <p>In the modulator spec, transmission rate mentioned is 1-35Msym. For DSNG unit it is understood that a single video channel will be transmitted. Which will in no case required more than 15Msym</p> <p>Amended text</p> <p>(d1) Transmission Rates - Variable, 1.0 to 35 M symbols / sec (For stand alone Modulator) (d2) Transmission Rates - Variable, 1.0 to 15 M symbols / sec (For Combined Encoder and Modulator)</p>
25	10	<p>2.3.4(11) L band O/P</p> <p>Existing text</p> <p>&lt; -80 dBm, &lt; - 55 dBc/4KHz</p> <p>Query</p> <p>Spurious-L band- Spurious may be specified as &lt;-60 dBm, and &lt;-55 dBc/4KHz</p> <p>Amended text</p> <p>Spurious-L band- Spurious : &lt;-60 dBm, and &lt;-55 dBc/4KHz</p>
26	9	<p>2.2.3.1</p> <p>Existing text</p> <p>The encoder shall be capable of the transmission of broadcast data signals along with video and audio</p> <p>Query</p> <p>Serial Data input is designed for control function and not for ANC input.</p> <p>Reply</p> <p>This is for information only.</p>
27	9	<p>2.3.1 (b) Modulator</p> <p>Existing text</p> <p>DVB-S2, 302307 Should be capable of emitting signals using following modes: 1. Backward compatible mode. 2. Non backward compatible mode 3. Constant Coding and Modulation (CCM). 4. Variable Coding and Modulation (VCM)</p> <p>Query</p> <p>Compliance-2. Non backward compatible mode Broadcast Modulator do not support DVB-S2 Hierarchical modes which are, to TTV's knowledge, not used by any broadcaster because of the disadvantages of Hierarchical mode. This feature may be deleted 4. Variable Coding and Modulation (VCM). VCM mode is not supported as it is for distribution applications (not DSNG). In this mode one can transmit multiple TS, which is not the case with DSNG and hence not applicable. This feature may also be deleted.</p> <p>Amended text</p> <p>DVB-S2, 302307 Should be capable of emitting signals using following modes: 1. Backward compatible mode. 2. Constant Coding and Modulation (CCM).</p>
28	10	<p>2.3.3 (i)</p> <p>Existing text</p> <p>&lt;-65 dBc/4KHz@-10dBm</p> <p>Query</p> <p>Spurious Outputs, IF Output-Spurious may be specified as :- &lt; -60 dBc/4 kHz over 0-500 MHz (modulated carrier) &amp; &lt; -55 dBc over 0-500 MHz (unmodulated carrier) This exceeds the IESS308 specification, the standard for Spurious and Noise</p> <p>Reply</p> <p>No change in specifications</p>
29	16	<p>5.5(i)</p> <p>Existing text</p> <p>The antenna system should be suitable for mounting on suitable vehicle and when stowed should have a low profile on the vehicle. No protrusion of antenna is allowed beyond the vehicle width.</p> <p>Reply</p> <p>The antenna system should be suitable for mounting on vehicle and when stowed down it should have a low profile on the vehicle. Protrusion of antenna should not be more than the maximum vehicle width.</p>
30	18	<p>7.1 (n) Convolutional Inner FEC</p> <p>Existing text</p> <p>R= 1/2, 2/3, 3/4, 5/6, 7/8( DVB-S option) QPSK R= 1/3, 2/5, 1/2, 3/5, 2/3, 3/4,4/5, 5/6, 8/9, 9/10 (DVB-S 2)</p> <p>Query</p> <p>1/2 &amp; 2/5 for DVBS2 may please be deleted as they are used in DVBS2 QPSK mode only.</p> <p>Amended text</p> <p>R= 1/2, 2/3, 3/4, 5/6, 7/8( DVB-S option) QPSK R= 1/3, 2/5, 1/2, 3/5, 2/3, 3/4,4/5, 5/6, 8/9, 9/10 (DVB-S 2,QPSK), R= 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (For DVBS2, 8PSK)</p>
31	18	<p>7.1 (m) Variable Symbol rate</p> <p>Existing text</p> <p>1.5 to 44.5 M symbol/Sec ( DVB-S) 1.5 to 30 Msymb/sec, minimum (DVB-S2)</p> <p>Query</p> <p>For DVBS 2 the Symbol rate start from 5 Msybs to 31Msybs and not from 1.5. It may be changed to DVBS-2 Standards.</p> <p>Reply</p> <p>1.0 to 44.5 M symbol/Sec (minimum) ( DVB-S) 1.5 to 30 Msymb/sec(minimum) (DVB-S2)</p>
32	18	<p>7.2(a) Video resolution-IRD</p> <p>Existing text</p> <p>1080x1920/1440/ i 25, 1080x1920/1440/1280/960i 29.97, 720x1280/960/640p 59.94</p> <p>Query</p> <p>Our IRD Model HD6100 does not support the resolutions of 1280 / 960 / 640. We would like you to delete 1280 / 960 / 640 from the specification.</p> <p>Amended text</p> <p>May be read as "1080x1920/1440/ i 25, 720x1280/ p50"</p>
33	18	<p>7.2(a) Video resolution-IRD</p> <p>Existing text</p> <p>1080x1920/1440/1280/960i 25 1080x1920/1440/1280/960i 29.97 720x1280/960/640p 50 720x1280/960/640p 59.94</p> <p>Query</p> <p>There is no mention of MPEG 2 resolutions. These may be specified:</p> <p>Amended text</p> <p>For HD 1080x1920/1440/ i 25, 720x1280/ p 50 and for SD 1080x1920/1440/1280/960i 25 1080x1920/1440/1280/960i 29.97 720x1280/960/640p 50 720x1280/960/640p 59.94</p>
34	18	<p>7.2(d)</p> <p>Existing text</p> <p>Audio Decompression Type - MPEG-1 Layer-II audio (Stereo/ Musicam, i.e. Single Mono, Dual Mono, Stereo, and Joint Stereo) Digital AAC 5.1 (HE, LE &amp; HE V2 Mode) Dolby AC-3 pass through</p> <p>Query</p> <p>Presently we don't support on IRD spec Audio decompression type- Digital AAC 5.1 HE . This is in our road map for early 2010. Will it be acceptable by DD?</p> <p>Reply</p> <p>Firm has to demonstrate, as and when asked as part of technical evaluation of Tender.</p>
35	18	<p>7.2(d)</p> <p>Existing text</p> <p>Audio Decompression Type - MPEG-1 Layer-II audio (Stereo/ Musicam, i.e. Single Mono, Dual Mono, Stereo, and Joint Stereo) Digital AAC 5.1 (HE, LE &amp; HE V2 Mode) Dolby AC-3 pass through</p> <p>Query</p> <p>Audio Decompression Type Digital AAC 5.1 Please remove HE V2 Mode.</p>

	Page	Item No.		Description
			Amended text	Audio Decompression Type - MPEG-1 Layer-II audio (Stereo/ Musicam, i.e. Single Mono, Dual Mono, Stereo, and Joint Stereo) Digital AAC (HE, LC Mode) AC-3 pass through
36	19	7.4 Transport Stream O/P	Existing text	MPEG-2 and MPEG-4 DVB-ASI on BNC
			Query	The ASI TS is always MPEG2 and not MPEG 4 even though it carries . MPEG 4 Packets. MPEG 4 may please be deleted from the parameter
			Amended text	MPEG-2 DVB-ASI on BNC
37	19	7.4 Video Output Specifica tions	Existing text	The IRD shall have two digital SDI outputs - one to provide a main output and the other for on-screen diagnostics without interruption of the main output. The IRD shall be ready without modification to receive and output the transmission of VBI signals.
			Query	Prof. Grade IRDs do not offer on-screen diagnostics without interruption of the main output. It used to be a feature of Scopus IRDs which are non existent now. This feature may please be deleted. Also please make the No of SDI ports as one instead of two to make it in sync with Point a) which specifies only one SDI port.
			Amended text	The item is deleted
38	19	7.4(b) Genlock	Existing text	There should be genlock SDI input
			Query	Presently we don't support on IRD spec section 7.4 (b) Gen lock. This is in our road map for end of 2009. Will it be acceptable by DD?
			Amended text	Firm has to demonstrate during the demo, as and when asked as part of technical evaluation of Tender.
39	19	7.4.1.2	Existing text	Serial Interface 270 Mb/s & SMPTE 272-1994 ( 10 bit)
			Query	The specification specifies that the serial interface is to be 10 bit. Our IRD model HVD6100 is designed for 8 bit and we would like to change the specification to 8 bit.
			Reply	No change in the specification.
40	20	7.5.2.1(b)	Existing text	Clipping Level SW Selectable to be provided
			Query	Presently we don't support on IRD spec clipping level. This is in our road map for 2010 and we be available in 2010 by SW upgrade. Will be acceptable by DD ?
			Reply	Firm has to demonstrate during the demo, as and when desired as part of technical evaluation of Tender.
41	20	7.5.2 Digital Audio	Existing text	Output Level +4 dB
			Query	It is normally specified in Volts say 2-7 volts. And not in dBs.
			Reply	Output Level 2 to 7 Volts.
42	21	7.9	Existing text	To monitor the audio and video quality multiple Monitor with corresponding, Audio Bar Graph panels are required
			Query	Our IRD Model HVD6100, does not have the monitor display on the front panel.
			Reply	This refers to Monitoring system and not to IRD feature.
43	25	9.3	Existing text	TYPE : Similar to CHEVROLET "TAVERA", TATA "SAFARI", MAHINDRA "SCORPIO" or similar or superior model fitted with five speed gear box. Power should be more then 75 PS/rpm. It should use Diesel as fuel.
			Query	Advice on use of vehicle
			Amended text	Similar to , MAHINDRA "SCORPIO" or TOYATA "Fortuner" or superior model fitted with five speed gear box 4x4 wheel driven. Power should be more then 165 PS/rpm. It should use Diesel as fuel.
44	31	Equipment List	Existing text	Two DSNGs will have 1 set of HD-MPEG-4 Encoders in 1+1 mode in addition to SD encoders. (Other 4 DSNGs should have blank space for 2 encoders of 1 RU each for future upgrade as and when required)
			Query	Do DD require single unit for both HD and SD Encoder OR separate 1+1 systems for HD and SD in the same vehicle ?
			Reply	HD and SD encoders should be supplied as separate units, so that HD encoders can be shifted to other DSNGs in case of requirements.
45		New Entry	Existing text	New Entry
			Amended text	Embedder to embed analogue Audio and AES / EBU audio with HD and SD SDI signal.( refer BOM Sl. No. 6(i) )
45		New Entry	Existing text	New Entry
			Amended text	Hardcase for Transportation of HD Encoder ( Refer BOM sl. No. 16( c) )

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## 12. EQUIPMENT LIST

The quantities indicated are provisional (for one system). Bidder should quote for quantities as required to complete the system.

Sr. No.	DESCRIPTION	QTY per Unit	Make	Model
<b>1</b>	<b>Vehicle mounted 1.8 Mtr to 2 Mtr, motorized Antenna System</b>	<b>1Set</b>		
a	Lightweight 1.8 to 2meter segmented antenna with mount system	1		
b	C-band 3 port feed (Tx range: 5.925 GHz to 6.425 GHz.)	1		
c	Transmit reject filter	2		
d	Interconnecting cables	1 set		
e	System tools	1		
f	Fluxgate Compass	1		
g	Inclinometer	1		
h	Antenna control unit along with software	1 set		
i	BTR (Beacon Tracking Receiver)	1		
j	Global Positioning System (GPS) with laptop for antenna control and monitoring	1		
k	Essential Additional Item (if any) to complete the antenna System	1 set		
l	Waveguide as per requirement	1 set		
m	NOCC Clearance	1 job		
<b>2</b>	<b>HIGH POWER AMPLIFIER</b>			
a	400 watt (350watt flange) C-band TWT amplifier with SSIPA (outdoor unit) (in 1+1 mode)	1 set		
b	Linearizer for 400 watt C-band TWT amplifier	2		
c	Amplifier Redundancy controller and ganged I/p O/p switch	1 set		
d	Essential Additional Item (if any) to complete the HPA System	1 set		
<b>3</b>	<b>Upconveter (incase of 70 MHz Mod) or BUC (incase of L-band Mod)</b>	<b>2</b>		
b	Upconveter Redundancy Switch (controller)	1		
c	Essential additional items (if any) to complete Up converter system	1set		
<b>4</b>	<b>Digital Equipment *</b>			
a	Encoder (for SD MPEG-4 & MPEG-2)	2		
b	BISS-E scrambling (H/W & S/W) for Encoders	2		
c	4:2:2 option for encoder	2		
d	Modulator	2		
e	Essential additional items (if any) for Encoder& Modulator	1 set		
<b>5</b>	<b>Receiving Setup equipment</b>	<b>1 Set</b>		
a	IRD (Integrated Receiver Decoder) (4:2:0 and 4:2:2) with BISS-E De-scrambling Facility and SDI output	2		
b	LNBC (3.625 GHz to 4.2 GHz. )	2		

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	c	Essential additional item (if any) to complete the receive set up	1 set		
<b>6</b>		<b>Monitoring Set up consisting of</b>			
	a	C-band Uplink frequency to L Band Down Converter (TLT)	1		
	b	DUAL Picture TFT monitor with size 5" to 6" (which can fit in the 19" rack) with SDI, CCVS, AES EBU inputs)	1		
	c	Dual AES and Dual Analogue Audio Monitor with bar graph & Speakers (which can be fit in the 19" rack below the TFT monitor) (Two stereo Audio per video) ( AAC 5.1 for HD DSNG)	1		
	d	Waveform Monitor Hand held for HD-SDI input (similar to WFM 5000 or equivalent)	1		
	e.	SDI equalizer (up to 200 meter length) (MIRANDA, KRAMER, GVG, or equivalent.)	2		
	f.	SDI / (AES/EBU) input matrix switcher 4X4 (for Video with associated Audio) (LEITCH, NETWORK, Kramer or equivalent)	1		
	g.	Colour bar and tone generator (Tektronix, KRAMER , R&S or equivalent)	1		
	h	4x2 SDI router (HD-SDI compatible) (Similar to Leitch, Kroma etc)	1		
	i	Audio (analogue and Digital) Embedder (similar to Miranda, Crystalvision etc.)	2		
	j	Essential additional item (in any) to complete the monitoring set up	1 set		
	k	L band to 70 Mhz Block down converter	1		
<b>7</b>		<b>Measuring Equipment</b>			
	a	Handheld Spectrum Analyzer (100KHz to 3GHz with standard Accessories), which should be able to resolve the Telemetry of INSAT series of satellite in C-band (Down converted to L band.) (Noise floor should be better than -105 dB at 1khz RBW) (With LCD Display)	1		
	b	Digital Multimeter (DMM 4.5 digits) (Fluke or Agilent or equivalent)	1		
	c	Handheld satellite tracker	1		
<b>8</b>		<b>Maintenance Tool Kit</b>	<b>1 Set</b>		
	a	Set of Tools for maintenance including soldering station (similar to Weller make)	1set		
	b	Flexible wave guide (0.5+ 0.5=1 meters) (Additional)	1		
	c	Tool box ( <b>Hard case type</b> )(which can be housed in the Vehicle) As per list	1 set		
	d	Essential Additional items (if any) for maintenance work	1set		
<b>9</b>					
	a	Light weight low noise Petrol /Diesel Genset of 6.0 (min.) KVA (Honda, Yamaha Or Equivalent.)	1		
	b	UPS of 5.0 KVA or more Capacity (APC, Tata Libert, Delta or equivalent)	1		
	c	Essential additional item (if any) to complete the UPS system	1 set		
<b>10</b>	a	System Integration & System Engineering	1set		
<b>11</b>		<b>Manuals &amp; CDs (with licensed software) of all The Equipments offered</b>			

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	a	CD ROM for all the software required in the System	4set		
	b	Operation / User Manual	4set		
	c	Maintenance/ Service Manuals (wherever applicable in case of select equipments)			
	d	Software upgrades within three year of installation should be supplied free of cost.			
12		<b>Training</b>			
	a	Training for Doordarshan Engineers in India (one week)	1 job		
13		Wireless Intercom System (4 Lines), approximately 100 meter operation wh	1		
14		Any other item to Complete the specifications, Installation and commissioning of the system.			
15		<b>Vehicle</b>			
	a	Vehicle			
	b	Customization of Vehicle			
	c	Registration of Vehicle			
	d	Essential additional item (if any) to complete the Vehicle			

Two DSNGs will have 1 set of HD-MPEG-4 Encoders in 1+1 mode in addition to SD encoders. (Other 4 DSNGs should have blank space for 2 encoders of 1 RU each for future upgrade as and when required)

16		<b>Digital Equipment *</b>			
	a	Encoder (1+1) ( for HD MPEG-4 )	1 set		
	b	BISS-E scrambling (H/W & S/W) for Encoders	2		
	c	Hardcase for Transportation	2		

**Note:**All software backups should be supplied on CDs.

1. Software upgrades within three year of installation should be supplied free of cost. Doordarshan should be registered as a ultimate user at the time of purchase of all software licenses.

- Any incomplete proposal is liable to be rejected.
- The prices for Software & Hardware wherever required should be given along with the equipment.
- Comparative statements regarding relative specification differences (minuses & pluses) vis-à-vis similar cards being asked for in the specifications should be elaborated.

4. All the relevant options of all the equipments to utilize the equipments to its full capacity must be quoted.

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