

Corrigendum for clarification

- 1.** Specification PS4042758 Rev01 is issued with minor change in SL No. 7 of specification “Scope of supply and services” to provide more clarity regarding requirement. There is no other change in specification.
- 2.** Price bid format is replaced with Price Break-up format. Price breakup format should be mandatorily attached along with price bid
- 3.** Line item for E&C charge is added in E-procurement portal so that vendor can quote E&C charge separately.



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TITLE Purchase Specification Large Video Screen for ENNORE (2X660MW)	Dept Code 404	DRN.	NAME	SIGN	DATE
		PREPARED	ARCHANA A T		22.01.2018
		CHECKED	BIRENDER NATH SHARMA		22.01.2018
		APPROVED	PRAKASH D		22.01.2018



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COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company	1. General: Large Video Screen (LED Based) complete with projector, screen, Master Controller, Matrix Switcher and associated accessories shall be supplied for 2 Units and common system as per the following specifications:																										
	<table border="0"> <tr> <td>1.1 Project</td> <td>:</td> <td>Ennore SEZ (2 x 660 MW)</td> </tr> <tr> <td>1.2 Location</td> <td>:</td> <td>2 x 660 MW ENNORE SEZ Supercritical Thermal Power Project at Ash Dyke of North Chennai TPS</td> </tr> <tr> <td>1.3 Make of Equipment</td> <td>:</td> <td>Should be sourced from principals of Bidder</td> </tr> <tr> <td>1.4 No of LVS</td> <td>:</td> <td>6 Nos (arranged as (5 X 1 + 1 x 1) arranged as a single video wall) in unit 2 Nos (arranged as a single Video wall) for Common System in Unit control room.</td> </tr> <tr> <td>1.5 Application</td> <td>:</td> <td>Display of Process Mimics/CCTV/Flame Camera's pictures etc</td> </tr> <tr> <td>1.6 DCS</td> <td>:</td> <td>Valmet DNA</td> </tr> <tr> <td>1.7 Control Room LAN</td> <td>:</td> <td>100 MBPS/1 GBPS Ethernet, redundant media, hybrid Star network</td> </tr> <tr> <td>1.8 Operating System for LVS Workstations</td> <td>:</td> <td>Microsoft Windows 10 Enterprise IoT Edition, 64 bit</td> </tr> </table>			1.1 Project	:	Ennore SEZ (2 x 660 MW)	1.2 Location	:	2 x 660 MW ENNORE SEZ Supercritical Thermal Power Project at Ash Dyke of North Chennai TPS	1.3 Make of Equipment	:	Should be sourced from principals of Bidder	1.4 No of LVS	:	6 Nos (arranged as (5 X 1 + 1 x 1) arranged as a single video wall) in unit 2 Nos (arranged as a single Video wall) for Common System in Unit control room.	1.5 Application	:	Display of Process Mimics/CCTV/Flame Camera's pictures etc	1.6 DCS	:	Valmet DNA	1.7 Control Room LAN	:	100 MBPS/1 GBPS Ethernet, redundant media, hybrid Star network	1.8 Operating System for LVS Workstations	:	Microsoft Windows 10 Enterprise IoT Edition, 64 bit
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	2. Specification of Rear Projection module																										
	Specification		Remarks Yes/No or Deviation if any																								
	The rear projection modules are based on Single Chip DLP Rear Projection technology 3 separate colour (Red, Green & Blue) LED lit, without any color wheel.																										
	The light source shall be LEDs of 3 different primary colors; Red, Green & Blue and not a single lamp using the LED as a light source.																										
	Shall have the scalability and upgradeability to be made up of multiple rear projection modules stacked up in rows and columns to achieve a display wall for better viewing ability in linear or curved configuration.																										
Each Rear Projection Module shall be with a native resolution of 1400 X 1050 pixels and shall offer 16.7 million colors. It shall be rear serviceable to avoid the operator distraction																											
The Visual Display Unit / Rear Projection Modules shall have in-built redundancy in LEDs, LED driver (power supply) and ensures redundancy at the light source level without any mechanical movement.																											
In case an LED shorts or LED driver (power supply) fails, system shall ensure the image without any primary color loss																											
a) The life of LED > 60,000 hrs.																											
b) The brightness uniformity shall not be less than 95% ANSI 9.																											
c) The contrast ratio shall be min. 1,600:1 or higher.																											
d) The Aspect Ratio of each of projection module shall be 4:3.																											
e) The projector brightness shall be 700 ANSI Lumens. The luminance on each rear projection module is 250 cd/m2.																											
f) The screen shall have low inter screen gap to give seamless viewing experience. It shall be <0.2 mm																											
g) During the useful lifetime of the illumination unit, there shall be real-time automatic color and brightness alignment of different projectors to a common target, resulting in a uniform display wall. The auto calibration system shall measure the hue of the color and adjust by the use of an internal spectrometer to measure the complete spectrum of each primary color, in order to derive the chromaticities																											
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with the highest accuracy	
h) The real-time automatic color (brightness of color as well as hue) and brightness alignment shall be done in the background, without any downtime or temporary loss of content and need of external calibration devices.	
i) The Projector shall support 2x DVI/Display Port/HDMI in and 1 x DVI out to have a flicker free image on the Large Screen Graphics Wall and support content redundancy.	
j) The pixel clock shall be > 162 MHz on both the inputs.	
k) Each cube shall have its own IP address to have the access from a standard web page from any WORK STATIONS over the Ethernet and shall communicate to a viewer via ethernet and it's IP address in star architecture to prevent communication loss. It shall have it's own webpage with status, health and configuration.	
l) Power consumption for each Visual Display Unit / Rear Projection Modules shall be less than 250 watts in the economy mode.	
m) As the LED lifetime drops by 50% if the LED junction temperature increases with 10°C, The LED cube shall have suitable and proven cooling Technology in order to guarantee the advertised lifetime.	

3. Functions of LVS

Specification	Remarks Yes/No or Deviation if any
a) Display of important data, graphics coming from the PC, Workstation, Video, SCADA, images from CCTV, IP camera etc in real time.	
b) To provide real time clear luminous view to share information to operators and visitors	
c) The 6 nos. Large Screen Graphics Wall of 84/80" diagonal size (5x1 + 1x1) shall be installed in the Control Room. The overall screen size shall be approx. 10000 mm (W) x 1500 mm (H). Design of LVS shall be in such a manner, that it can be installed in linear or curvature setup.	
d) The overall resolution of the 6 nos. graphics wall (5x1 + 1x1) shall be min. 8400mm x 1050mm pixels or better.	
e) The whole screen of the Large Screen Graphics Wall should behave as a single logical screen and the control of the same should be from a dedicated Graphical Control Unit (Controller) having a Keyboard & mouse. However it should be possible to control & monitor the each Graphics Wall from the WORK STATIONS on DDCMIS/DCS System LAN having Windows 10 OS. DDCMIS/DCS software shall be compatible to display the two graphics simultaneously i.e one on OWS monitor and other on LVS.	
f) The complete system shall be interfaced on 10/100/1000 MBPS redundant LAN. Also LVS shall be integrated with the RGB, Video signals available in the Control Room by providing extra input cards.	
g) The Large Screen System should have the functionality to pre configure and save various display layouts to be accessed at any given point of time with a simple mouse click.	
h) The system should be possible to show the mirror images of operator workstations running on WINDOWS 10 & sitting on data highway	
i) The system should be configured such that any of the operators sitting on the same Ethernet should be able to work on the Large Screen sitting at his own position with his local keyboard & mouse.	
j) The offered system should be able to work in 24/7 days environment and is of industrial nature.	

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COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company	4. Specification of Master Control Unit		
	LVS cubes shall be connected to workstations (supplied by BHEL/EDN) through a Matrix Switcher. LVS cubes shall also be connected through the Master Controller. The indicative configuration is shown in Annexure – I. OWS with mouse & keyboard shall be placed on the operator desk. The LVS controller shall be placed below the mechanical structure/Rack behind LVS. The keyboard & mouse of LVS controller is to be kept on operator desk, which will be around 20 meters away from the LVS.		
	Specification	Remarks Yes/No or Deviation if any	
	Industrial 19" rack mounted casing based on below configuration - Intel Xeon E5-2600 series v4 or higher 8 cores, min 2.1 GHz dual Processor 24 GB RAM 3nos. X 600GB, SAS Hot Pluggable hard disks with RAID 5 implementation - Graphics card with 1 GB RAM - Dual hot pluggable power supplies/fans - Ethernet cards 10/100/1000 Mbps -2 nos. - DVD +/- RW drive - USB keyboard and USB Optical mouse - Min 4 nos USB ports - Windows 2012 server R2 standard OS with license and media		
	Supplied with a Keyboard and mouse with min. 20 m cable extension.		
	Min. 1 to 8 Graphics Output to be connected to 5-rear projection modules in unit; Min. 1 to 8 Graphics Output to be connected to 1-rear projection modules in unit(For Siemens STG); Min. 1 to 8 Graphics Output to be connected to 2-rear projection modules in common system		
	The system shall have future expansion possibilities.		
	As no full hardwired backup has been envisaged, the plant LVS shall ensure control/operation of the plant in case of total failure of all operator stations. Hence Complete DDCMIS/DCS HMI & Operation software shall also be loaded on display/master controller.		
	There shall be possibility of connecting the various types of analog and digital sources using single multi standard input card in freely scalable and moveable windows on the graphics wall. It shall support : - SDTV analog PAL, NTSC, SECAM (Composite, S-Video, Component) - HDTV 720p, 1080i, 1080p (Component) - RGB analog up to 1920x1200 (up to 165 MHz pixel clock) - DVI up to 1920x1200 (up to 165 MHz pixel clock)		
	Shall have full range scaling capability from finger print size to full wall size		
	The controller shall provide integrated hardware accelerated streaming video decoding using streaming video decoder cards. The Display/master controller shall be capable of supporting integrated streaming video input cards to achieve a seamless integration between potential future IP networks and the display wall. The streaming video card shall provide IP interfacing and hardware decoding of the streaming video input locally on the card, and shall not require any additional processing power from the CPU of the main base unit for this task. The integrated hardware decoding shall be independent from a large set of current encoder suppliers. The manufacturer shall publish his encoder interoperability list.		
	The decoder card shall have a dual 10/100 Base-T failover Ethernet interface		
	The decoder card shall support IGMP multicasting		
	The decoder card shall support MPEG-2, MPEG-4, MJPEG & H.264 compression protocols.		
	The decoder card shall allow implementing other compression protocols via a firmware upgrade		
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COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company	A4-10	The decoder card shall decode up to four (4) channels simultaneously Display/master controller shall have suitable cards for interfacing with Video signals, to receive & project pictures from CCTV, Employer's live camera, VCP/VCD player/DVD player, SCADA, Input signals like DVI – D, DVI-I, Video input (PAL, NTSC, SECAM), HD signals & DDCMIS. The system shall also accept IP stream from CCTV camera with suitable IP input cards. The Remote unit for switching between video signal & MMI signal, selecting the video signal channel (live camera no./ location typically) shall be provided.																												
	5. Wall Management Software: Wall management software provides a visual environment to control the entire wall layout. With Wall management Software, windows on the video wall can be opened, placed, moved and sized. Layouts can be saved and recalled. The Wall management Software interface dynamically adjusts to display whatever type of source is connected to the controller and the software's interface complies with the familiar Windows design standards making it intuitive and easy to learn.																													
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LVS Diagnostic Software shall allow commands on wall level or cube level or a selection of cubes :

- i) Switching the entire display wall on or off.
- ii) Setting all projection modules to a common brightness target, which can be either static (fixed) or dynamic to always achieve maximum (or minimum) common brightness between projection modules.
- iii) Switching to either Eco or Normal operation mode.
- iv) Changing the active input (of the two present DVI inputs).
- v) Fine tune color of each cube

The integrated view shall provide a database that

- i) records all events
- ii) can record full status at given time intervals
- iii) can be exported to excel/html
- iv) Show internal patterns

6. Technical Specification:

Sl. No	Description	Specification	Vendor Confirmation
1	Individual Screen Size (Diagonal)	80 inch / 84 inch	Yes/No
2	Type	LED Illuminated Digital Light Processing (DLP) technology with rear projection configuration	Yes/No
3	Resolution of each screen	Minimum 1400 X 1050 pixels; LVS shall support an aspect ratio of 4:3	Yes/No
4	Configuration of LVS	Single tier with screens seamlessly combined with provision of expansion of one screen on each side. Input to be considered in LVS Controller. (as per Annexure - I)	Yes/No
5	Illumination level	250 cd / m ²	Yes/No
6	Degree of viewing in horizontal & vertical	Horizontal viewing angle at half gain = 36° Vertical viewing angle at half gain = 23°	Yes/No
7	Cube Feature	Each cube should be capable of taking two inputs. Facility of projecting a particular display on a selectable area of the screen upon activation of a predefined event shall be provided.	Yes/No
8	LVS Operating Temperature	Shall be able to operate at around 25°C	Yes/No
9	Input Signal Interface	Interfacing with video signals to receive & project pictures from CCTV, Employer's live cameras, VCP, Flame Camera. This Video signals shall be connected to video wall through master controller Signal types: SDTV analog PAL, NTSC, SECAM (Composite, S-Video, Component) - HDTV 720p, 1080i, 1080p (Component) - RGB analog up to 1920x1200 (up to 165 MHz pixel clock) - DVI up to 1920x1200 (up to 165 MHz pixel clock) No. of Input channels:16 No. of Output channels:4 Output of the Video Switcher will be connected to video wall through Master Controller.	Yes./No
10	Master Control Unit	Master Control unit shall be provided for controlling the entire video wall in unit control room LVS. It shall be capable of projecting HMI displays over a part a part of screen to multiple screens. Any configuration of windows shall be possible. Facility for overlay shall	Yes/No

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		be provided. Remote unit for switching between video signal & HMI signal, selecting the video signal channel shall be provided.	
11	Matrix Switcher	A matrix switcher shall be provided used for connecting the OWS to video wall. No. of Inputs: 8 Nos. No. of Outputs: 8 Nos.	Yes/No
12	LVS Panel	Complete LVS system (LVS with mechanical structure) shall be fully wired with necessary provision for convenience outlets, internal lighting, grounding, and ventilation	Yes/No
13	Make of Equipment	Barco / Planar / Delta / equivalent* LVS and controller should be from same source.	Yes/No

***- Subject to approval of Make from M/s TANGEDCO. Necessary credentials viz., list of supplied/installed projects, performance certificate, PTR, etc. to be submitted along with technical offer for onward submission to customer for their scrutiny.**

Notes on Technical Specification:

Sl. No	Description	Vendor Confirmation
1	Screen shall be flicker free and there shall not be any screen burn in due to display of same information for a long time. LVS shall be designed for continuous viewing (24 hours in a day) under normal room ambient lighting without any need to darken the room. Suitable darkening of the projection screen for light absorption shall be provided for this purpose.	Yes/No
2	For 24x7 viewing, suitable darkening of the projection screen for light absorption shall be provided	Yes/No
3	Supplier to confirm that quoted model is latest and will not be obsolete at the time of supply	Yes/No
4	Projection and other components shall be factory adjusted	Yes/No
6	Provision for auto brightness & color adjustment between each screen should be available	Yes/No
7	Facility for Interfacing with video signals to receive and project pictures from CCTV, Live Camera, Furnace camera, PSSS system etc. should be provided	Yes/No
8	In the event of failure of any LVS, any of the other LVS shall be capable of being used in place of the failed LVS. The supplier shall provide a suitable network / switching facility for this purpose.	Yes/No
9	The LVS & its accessories shall be designed in such a way that the brightness in the center of the screen and the edges of the screen is uniform and there is no perceivable difference in the quality of the picture on the center and on the edges of the screen. If any extra hardware has to be provided for achieving the above features, same shall be provided by the supplier	Yes/No
10	Video wall expansion, horizontally or vertically on each side should be possible	Yes/No
11	The stands below the LVS screen should be covered. The height of the stand shall be such that operator's vision of the LVS shall not be cut due to monitor kept on the operator desk	Yes/No
12	Angle of curvature between two screens will 6° OR 8°	Yes/No
13	Software: All associated software and drivers for the said LVS to run on Windows 10 Enterprise IoT 2015 and Windows 2012 server R2 standard. They should be supplied with original license in CD / DVD Media.	Yes/No
14	In case of failure of the master controller, LVS shall be able to project images through OWS.	Yes/No

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7. Scope of supply and services for unit and common:

Sl. No.	Description	Quantity				
		U1	U1 (TG)	U2	U2 (TG)	Common
1	LVS (80" /84" Diagonal), Rear Projection System complete with projection engine, mirrors and LED Illumination Unit	5	1	5	1	2
2	Master Controller with keyboard, mouse extension cable and Interface card with min. 1 to 8 Graphics Output to meet display requirement as mentioned in this specification.	1	1	1	1	1
3	Matrix Switcher with required accessories to meet the requirement as mentioned in this specification	1	-	1	-	-
4	Video Matrix switcher 16 x 4	1	-	1	-	-
5	Mechanical structure (Basement) of enclosed type	5	1	5	1	2
6	Mounting accessories as per supplied standards	1		1		1
7	Set of interface, power, and communication cables as required (Power cable plugs should be suitable for Indian sockets)	1		1		1
8	DVI-DVI cable – a. 20 meters (to connect Operator stations with Matrix switcher) with DVI to DP adaptor at Operator station end b. 20 meters (for Operator stations to LVS connectivity for common system) with DVI to DP adaptor at Operator station end	8	-	8	-	2
9	DVI-DVI cable – 10 meters (for LVS to Matrix switcher connectivity) with suitable adaptor	5	-	5	-	-
10	DVI-DVI cable – 10 meters (for LVS to Controller connectivity) with suitable adaptor	5	1	5	1	2
11	Other interfacing cables if any	As required		As required		As required
12	Video cable-10 meter (to connect Video switcher to Controller)	4	-	4	-	-
13	Accessories - including remote for switching brightness and contrast control as applicable, etc. required for complete system as per supplier standards	5	1	5	1	2
14	Remote unit for switching between video signal and HMI signal, selecting the video signal channel	1	-	1	-	-
15	Erection and commissioning at site	1		1		1
16	Original Software and drivers with DVD / CD Media and License	1		1		1
17	Any other items required (whether specially mentioned in specification or not) for proper functioning of LVS and meeting display requirements	As per requirement		As per requirement		As per requirement

8. Scope of Supply for Mandatory Spare common for all units:

Sl. No	Item Description	Quantity
1	LED lamps	3 Sets.
2	LVS Filters	50% of total qty or 6 nos. min
3	Power Supply Modules of each type for LVS	3 Nos.
4	Electronic cards of each type for LVS	3 Nos each.

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	a. Video BD assembly / input box b. DVI output card c. Video input card d. Universal input card e. DVI input card f. IP streams decoding input card	
5	Interfacing cables 1. DVI-DVI cable – 20 meters (for Operator stations to Matrix switcher) with DVI to DP adaptor at Operator station end 2. DVI-DVI cable – 10 meters (for LVS to Matrix switcher connectivity) with suitable adaptor 3. DVI-DVI cable – 10 meters (for LVS to Controller connectivity) with suitable adaptor 4. Video cable-10 meter (to connect Video switcher to Controller) 5. Other interfacing cables if any	2 sets of each type and size
6	Cooling modules of each type for LVS	3 Nos.
7	LVS controller with 1 to 8 Graphics Output to meet display requirement as mentioned in this specification.	2 nos

Notes on Scope of Supply

- All items listed in spares shall be of same make as in main supply.
- Provide a list of items, cables and accessories with quantity as scope of supply.
- All cables required as per LVS configuration (Annexure – I) is under vendor's scope.
- Offer shall include:
 - Breakup prices of items with part number and quantity.
 - Details of Assembling, installation and commissioning at site.
 - All cables (control, power and interconnecting) are included in the scope.
 - Training on operation and maintenance for BHEL and Customer (End User).

9. Features of Equipment: Vendor to furnish details of following features along with offer:

Sl. No.	Details	Vendor Confirmation
1	Mechanical Features of Display Unit like – Image diagonal, width & height, Cube depth, height and weight	Yes/No
2	Display Update Time on LVS	Yes/No
3	Viewing Angle (angle of observation) from the operator desk.	Yes/No
4	Enclosure details including protection clauses applicable	Yes/No
5	On Screen Display Settings/Diagnostics available	Yes/No
6	Mounting/ Erection details	Yes/No
7	Total power consumption & Heat Dissipation for the LVS configuration	Yes/No
8	Details of Safety standard, Emission, Noise and EMC standards applicable	Yes/No
9	Provision & usage of remote controller for setting and adjustment	Yes/No
10	Illumination Unit details and options	Yes/No
11	LED Life	Yes/No
12	Brightness output and homogeneity	Yes/No
13	Operating and storage temperature & humidity	Yes/No

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10. Quality Assurance:

Following routine tests shall be included in the Quality plan for LVS system:

Sl. No.	Details	Vendor Confirmation
1	Healthiness of all modules	Yes/No
2	Healthiness ,functional check for Peripherals	Yes/No
3	Verification of System configuration	Yes/No
4	Environmental Stress Screening test	Yes/No
5	Diagnostic tests	Yes/No
6	Check for brightness, sharpness, color/contrast adjustments, lamp life counter	Yes/No

Note on Quality Assurance:

Sl. No.	Details	Vendor Confirmation
1	This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the standard practices and procedures adopted along with relevant supporting documents	Yes/No

11. Warranty, site support and service conditions

Sl. No.	Details	Vendor Confirmation
1	Warranty : 3 years Comprehensive On – Site Warranty	Yes/No
2	Packaging : 1. Weatherproof packing with sufficient cushioning to avoid transit damage, Secured Packing of the system [No loose items or tied with a string]. 2. Vendor to provide a detailed packing list of the items packaged in each section and there should be a direct correlation of the items in packing list to the items mentioned in the main BOM. This is for the purpose of verifying that all the line items mentioned in the BOM are supplied during dispatch from Vendor works and while receiving the items at site	Yes/No
3	Storage requirement at site should be specified	Yes/No
4	Any mechanical damaged part should be replaced at site free of cost	Yes/No
5	The screen offered should not bend due to transport, storage, ambient temperature etc. or during installation. In case bend is observed in screen during or after installation, the same shall be replaced by supplier at free of cost.	Yes/No
6	All services required for assembly, installation & commissioning of LVS shall be provided at site	Yes/No
7	All requirements of installation & specific material required shall be provided by supplier, as required by control room designer	Yes/No
8	Vendor to mention the agency for maintenance support in India with complete contact details	Yes/No

12. Documents to be given along with Technical Proposal

Sl. No	Details	Vendor Confirmation
1	Bill of Material [List of items, part no, make and quantity]	Yes/No
2	Technical Write – up with configuration diagram showing workstation and LAN, with explanation, how the offer system will meet our requirement	Yes/No
3	Data Sheet of Models Proposed	Yes/No
4	Deviations, if any, with respect to the specifications and technical justification of alternate offer.	Yes/No
5	Point – wise compliance against each clause given in this specification	Yes/No
6	Complete details of Display/master Controller Unit with its associated software	Yes/No
7	Layout arrangement drawings – 6 LVS are to be arranged in single row for unit 1 / 2	Yes/No

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	and Common- 2 LVS in single row	
8	Dimensional details of LVS unit and Display Wall with Mechanical Structure	Yes/No
9	Recommendation on light, color of room, ergonomic arrangement with respect to operator desk and control room.	Yes/No
10	List of Service Centers in India.	Yes/No

13. Documents to be submitted for approval [Manufacturing Clearance] after placement of order

Sl. No.	Details	Vendor Confirmation
1	Configuration Diagram (as per Annexure - I)	Yes/No
2	Dimensional drawings (including cutout details for LVS) – GA drawing of the video wall	Yes/No
3	Bill of Materials of all items	Yes/No
4	Quality Plan (As per section 9)	Yes/No
5	Test Protocol, Test Instruction, and Test Reports	Yes/No
6	Datasheet of Models being supplied	Yes/No
7	Any other relevant documents	Yes/No

14. Documents to be given along with equipment

Sl. No.	Details	Vendor Confirmation
1	Manual of the individual equipment involved in making the total system as well as the documents for the total system to be supplied	Yes/No
2	Installation and commissioning Instruction manuals	Yes/No
3	Licensed Software and drivers along with original media	Yes/No
4	List of Equipment	Yes/No
5	List of service centers close to location with contact person name, phone and address	Yes/No
6	Test Certificates, should include following among others, wherever applicable - Visual Inspection Report. - GA, BOM, layout. - Dimensions. - Alignment Details. - Component Rating / Make / Type. - Wiring details.	Yes/No

15. Acceptance Criteria

- 11.1 Completeness of supplies and documentation as per specification.
11.2 Test certificates.

16. Training

Sl. No.	Details	Vendor Confirmation
1	Training shall be provided in operation & maintenance of equipment to BHEL and Customer personnel during and after commissioning at site.	Yes/No

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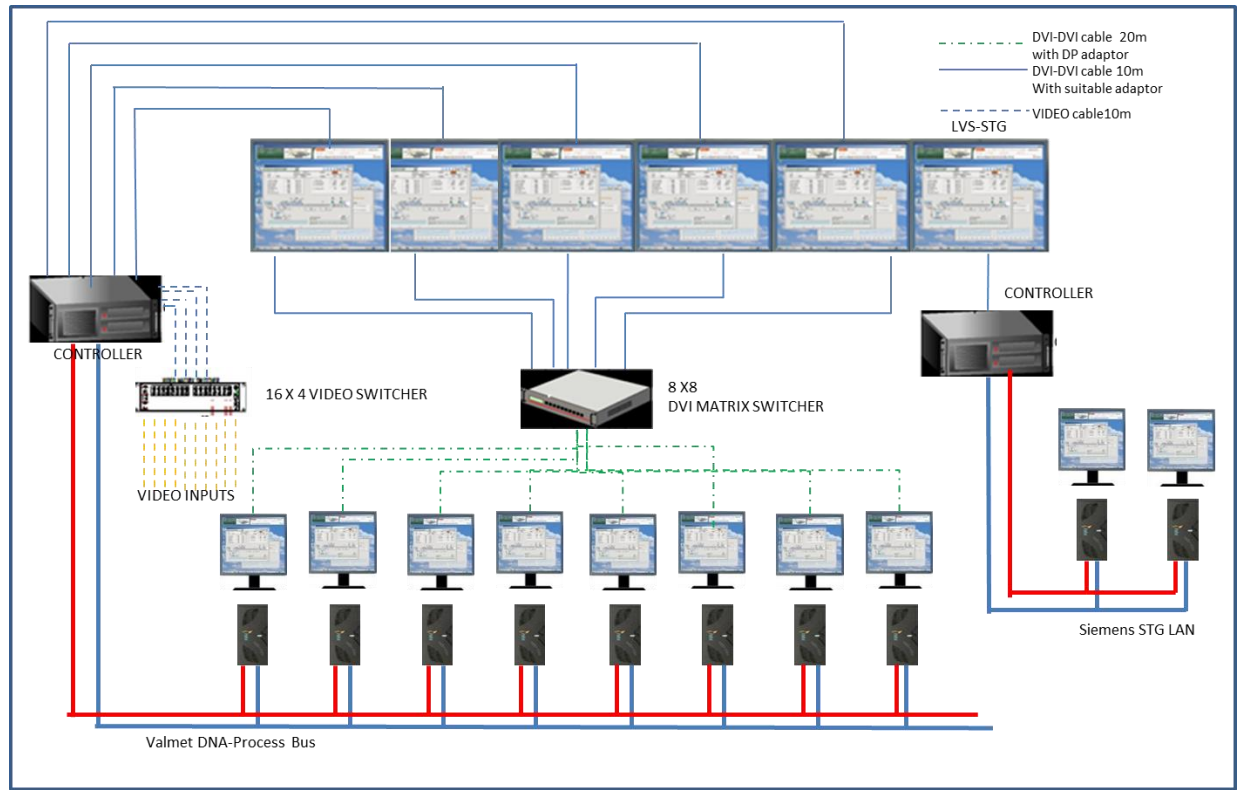
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Annexure – I

LVS CONFIGURATION FOR EACH UNIT-2 SETS



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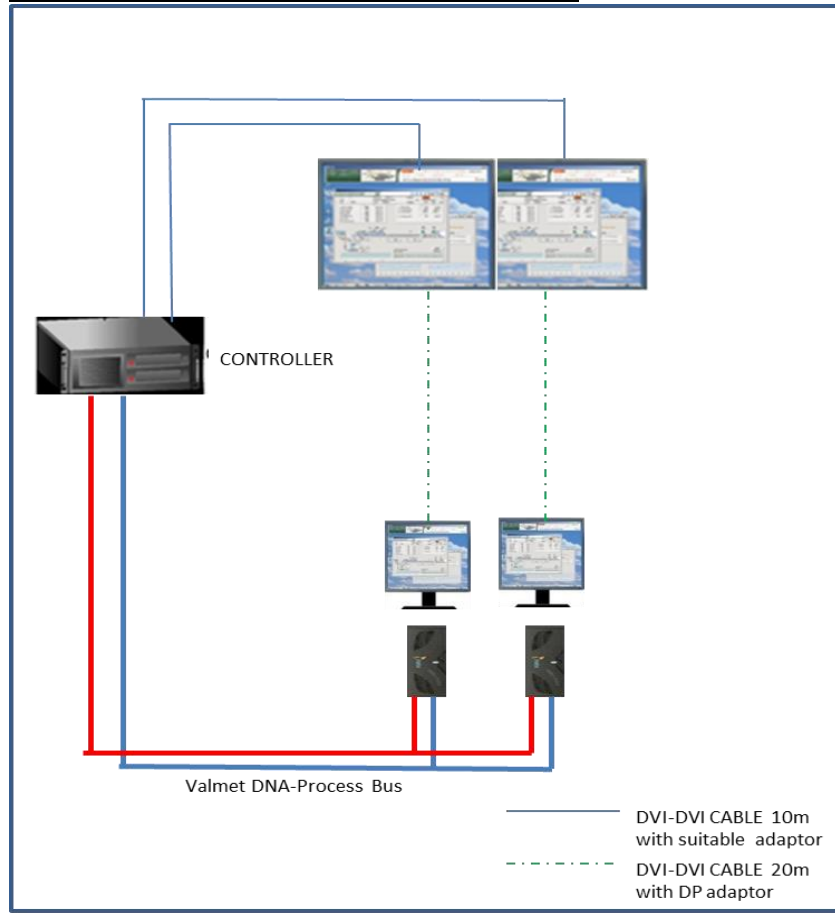
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LVS CONFIGURATION FOR COMMON SYSTEM- 1SET



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PRICE BREAKUP FORMAT		
Sl. No.	Description	Unit Rate in INR
1	LVS (80" /84" Diagonal), Rear Projection System complete with projection engine, mirrors and LED Illumination Unit	
2	Master Controller with keyboard, mouse extension cable and Interface card with min. 1 to 8 Graphics Output to meet display requirement as mentioned in this specification.	
3	Matrix Switcher with required accessories to meet the requirement as mentioned in this specification	
4	Video Matrix switcher 16 x 4	
5	Mechanical structure (Basement) of enclosed type	
6	Mounting accessories as per supplied standards	
7	Set of interface, power, and communication cables as required (Power cable plugs should be suitable for Indian sockets)	
8	DVI-DVI cable –	
	a. 20 meters (to connect Operator stations with Matrix switcher) with DVI to DP adaptor at Operator station end	
	b. 20 meters (for Operator stations to LVS connectivity for common system) with DVI to DP adaptor at Operator station end	
9	DVI-DVI cable – 10 meters (for LVS to Matrix switcher connectivity) with suitable adaptor	
10	DVI-DVI cable – 10 meters (for LVS to Controller connectivity) with suitable adaptor	
11	Other interfacing cables if any	
12	Video cable-10 meter (to connect Video switcher to Controller)	
13	Accessories - including remote for switching brightness and contrast control as applicable, etc. required for complete system as per supplier standards	
14	Remote unit for switching between video signal and HMI signal, selecting the video signal channel	
16	Original Software and drivers with DVD / CD Media and License	
17	Any other items required (whether specially mentioned in specification or not) for proper functioning of LVS and meeting display requirements	

Mandatory Spares

Sl. No	Item Description	Unit Rate in INR
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1	LED lamps	
2	LVS Filters	
3	Power Supply Modules of each type for LVS	
4	Electronic cards of each type for LVS	
	a. Video BD assembly / input box	
	b. DVI output card	
	c. Video input card	
	d. Universal input card	
	e. DVI input card	
	f. IP streams decoding input card	
5	Interfacing cables	
	1. DVI-DVI cable – 20 meters (for Operator stations to Matrix switcher) with DVI to DP adaptor at Operator station end	
	2. DVI-DVI cable – 10 meters (for LVS to Matrix switcher connectivity) with suitable adaptor	
	3. DVI-DVI cable – 10 meters (for LVS to Controller connectivity) with suitable adaptor	
	4. Video cable-10 meter (to connect Video switcher to Controller)	
	5. Other interfacing cables if any	
6	Cooling modules of each type for LVS	
7	LVS controller with 1 to 8 Graphics Output to meet display requirement as mentioned in this specification.	