



LUCKNOW METRO RAIL CORPORATION LIMITED

1st Floor, Janpath Market Building, Hazratganj, Lucknow - 226001

E-mail: drslucknowmetro@gmail.com

Our Ref: LMRC/Elect/Tender/LKE-1&2

Date: 21th May'2015

TO

All Bidders

SUB: Corrigendum-2 to Tender Package LKE-1&2

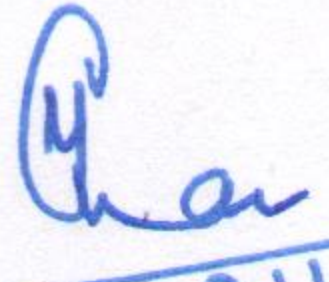
Ref: Tender LKE 1&2 for Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main cum Traction Sub Stations Including High Voltage Cabling from Grid Substation, 25kV Flexible/Rigid OHE, Sectioning Post, 33kV Cable Network, ASS & SCADA System including Catenary Maintenance Vehicle/ Rail Cum Road Vehicle for Lucknow MRTS Phase-I

Dear Sir,

Please find enclosed corrigendum-2 to Tender Package LKE 1&2 as correction on account of changes in Addendum-1.

Thanking You,

Yours faithfully,


21/5/15
(Mahendra Kumar)

Director (Rolling Stock & Systems)

Encl.: a/a

1.7.11 Video Display Unit

1.7.11.1 Description

- a) The Large Screen Graphics Wall shall be installed in the Operation Control Centre at Sahkarita Bhawan near Sachivalya Metro Station. The Large Screen Graphics Wall shall be made up of 12 Rear Projection Modules fitted in 6 columns wide and 2 row high.
- b) The large screen graphics wall in the control room shall be used for the display of important graphics from the pc, workstation, ~~Images from IP video cameras~~. It 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.
- c) The large screen should provide real-time clear luminous view to share information between operators and decision makers. The operators whose systems are on the same Ethernet should be able to work on the large screen sitting at their own position with their own PC's keyboard & mouse.
- d) The large screen should be able to show the images of the monitor, which is connected on the LAN with WIN XP OWS and the windows should be freely resizable, scalable and repositionable on any part of the large video screen.
- e) The large graphics wall shall be consisting of multiple rear projection modules in multiple rows and columns behaving as a single logical screen.
- f) The large screen should be able to show the applications of Windows 7 pro 64 bitXP or higher. However, it should be also capable of showing the UNIX applications on the WINDOWS application platform by using X-emulation software.
- g) The display wall should be rugged and industrial nature and should be able to work in 24/7 environments.

1.7.11.2 The display wall should consist of the Visual Display Unit, Display Controller and the Wall Management Software, which should be supplied from a single manufacturer with the following specifications:

- a) The Visual Display Unit / Rear Projection Module must be based on Single Chip DLP-based Rear Projection Technology, 3 separate colour (Red, Green & Blue) LED lit, without any colour wheel.
- b) The light source should be LEDs of 3 different primary colours; Red, Green & Blue and not a single lamp using the LED as a light source.
- c) Should 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.
- d) The Diagonal Size of each Visual Display Unit / Rear Projection Module should be 70" nominal with a native resolution of 1920 X 1080 pixels (Full

HD) and should offer 16.7 million colors.

- e) The Visual Display Unit / Rear Projection Modules should have in-built redundancy in LEDs and ensures redundancy at the light source level without any mechanical movement. In case redundancy of light source is not there, bidder to provide spare projection engines (2 Nos.) to handle light source failure.
- f) The MTBF of LED > 80,000 hrs.
- g) In case of LED failure or wear out, the LED's shall be field replaceable with MTTR < ~~15 one hour~~min without engine removal.
- h) The brightness uniformity should be > ~~95~~90%.
- i) The ~~dynamic~~ contrast shall be ~~560,000~~1500:1 or higher.
- j) The Aspect Ratio of each of projection module should be 16:9.
- k) The luminance on each rear projection module is 170 cd/m² (typical) with wide viewing angle screens.
- l) ~~The screen should have adjustable low inter screen gap <to give seamless viewing experience. It should be <1.5 mm measured at 25°C. The screen of almost zero gap technology (inter-screen < 0.8 mm) . The screen surface should not be reflective with the half gain angle of the screen used in + 35° horizontal and 27° vertical position~~
- m) During the useful lifetime of the illumination unit, it should be possible for color and brightness alignment of different projectors to a common target, resulting in a uniform display wall automatically.
- n) The input to Projector module should ~~be support Duallink-DVI-D or better in and Dual link DVI out~~ to have a flicker free image on the Large Screen Graphics Wall.
- o) ~~The pixel clock shall be > 320 MHz on the Dual Link DVI input~~Deleted.
- p) ~~Each cube shall have its own IP address to have the access from a standard web page from any PC over the Ethernet and shall communicate to a viewer via Ethernet and its IP address in star architecture to prevent communication loss. It shall have its own webpage with status, health and configuration~~ Deleted.
- q) Power consumption for each Visual Display Unit / Rear Projection Modules should be ~~typically Economy mode;200~~ 230 watts, Typical: 280 W, Maximum: 350W. Operating temperature shall be 5° C to 40° C for electronics and 10° C-30 ° C for screen. Humidity range : < 80% non – condensing.
- r) ~~As the LED lifetime drops by 50% if the LED junction temperature increases with 10°C, active liquid cooling shall be applied directly at the junction of the LEDs in order to guarantee the advertised lifetime. In case active cooling is not employed, bidder to provide 4 sets of spare LED chains (1 set containing red, green & blue LED)~~Deleted.

1.7.11.3 The Display Controller should have the following specifications:

- a) The Controller should be in an industrial 19" rack mounted casing (6U) based on Intel Quad Core CPU 2.66 GHz (Min.)
- b) The min. memory of ~~4~~8 GB (standard) expandable upto 32 GB and should DDR3 or latest type.
- c) The unit should be equipped with a DVD ROM Drive.
- d) The system should be equipped with ~~250~~500 GB HDD in RAID 1 Configuration.
- e) The display controller should have dual redundant hot swappable power supply.
- f) Should have 10/100/1000 Mbps Redundant Ethernet port for LAN connection.
- g) Supplied with a Keyboard and mouse with 20 m cable extension.
- h) The Display Controller should be based on WINDOWS OS.
- i) There should be possibility of connecting the various type of analog and digital sources which can be shown in freely scalable and moveable windows on the graphics wall. It should support 2 DVI/VGA/HDMI Inputs and 8 Composite video inputs.
- †j) Should have full range scaling capability from finger print size to full wall size.

1.7.11.4 The Wall Management Software should have the following specifications:

- a) The software should be able pre configure various display layouts and access them at any time with a simple mouse click or based on the timer.
- b) The software should enable the users to see the desktop of the graphics display wall remotely on the any WIN 2K PC connected with the Display Controller over the Ethernet and change the size and position of the various windows being shown.
- c) The software should enable various operators to access the display wall from the local keyboard and mouse of their WIN ~~XP~~7 Prof. or higher workstation connected with the Display Controller on the Ethernet.
- d) The software should copy the screen content of the WIN ~~XP~~7 PC or higher / workstation connected on the Ethernet with the Display Controller to be shown on the Display wall in scalable and moveable windows in real time environment.
- e) The wall management software should support open APIs to enable system integrators to integrate it with their Software.
- f) The Diagnostic software shall perform health monitoring that allows timely detection of faults.
 - Wall health

- Cube health
 - Cube IP-address
 - Brightness adjustments
 - Comprehensive colour adjustments.
- g) Diagnostic Software shall allow commands on wall level or cube level or a selection of cubes :
- Switching the entire display wall on or off.
 - ~~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.~~
 - Fine tune color of each cube
- h) The integrated view shall provide a database as per employers requirementthat,
- ~~records all events~~
 - ~~can record full status at given time intervals~~
 - ~~can be exported to excel/html~~
 - Show internal patterns

1.7.11.5 The bidder/Sub-contractor should fulfill the following requirements:

- a) The complete solution i.e. the projection modules, display controller, and the wall management software should be compatible and proven.
- b) Manufacturer owned local after sales support office and sales support organization to be there in India. Alternatively the maintenance support for the system to be detailed out for the next 10 yrs after DLP.
- c) Should have the experience of executing at least 2 such similar size of contract of the display wall in past two years in India or abroad to the same specifications as in this tender. Proof by way of documentary support to be submitted in this regard from the User as part of the Bid Submission
- d) Display shall be of good quality as viewed from the operator's position.
- e) Color and graphics scheme shall be ergonomically designed and shall take into consideration size, seating arrangement and lighting of OCC. Contractor shall provide ergonomic design of the display wall at OCC to the employer's engineer and take approval.
- f) Factory Acceptance Test shall be done prior to dispatch and actual graphics shall be shown at the time of FAT. Contractor shall provide & organise display wall mock up demonstration at manufacturer's place for review by employer's engineer before implementation.

- 1.7.11.6 There shall be provision for future expansion. It shall provide an unobstructed view to control room staff.

1.7.12 Functional Requirement

1.7.12.1 Data processing at field level

The RTUs shall support Local Automation Function (LAF) for achieving safe and efficient local operations. Some data processing may be performed more efficiently at field level, avoiding unnecessary data transmission between SCADA central and field equipment. All data processing necessary for the safety of supervised field equipment shall be performed locally.

1.7.12.2 Time Synchronization

- a) A time synchronization system shall distribute the same reference time to the SCADA System, and all relevant SCADA System field equipment to ensure that all systems are synchronized to a common time reference. This reference time shall be obtained from the Master clock.
- b) The time synchronization message shall contain date, hour, minute and second information. The SCADA System central equipment shall send periodically a reference time containing date, hour, minute and second information to the SCADA System field equipment which shall reset their internal clock according to the reference given in the message. In case of central system failure, the loss of reference time dispatching shall not upset local operation. All equipment shall work normally, only the accuracy of timing and synchronization of the various items of equipment will be affected.
- c) All equipment requiring a time reference shall have a built-in one. If the power supply fails, this internal time reference shall be maintained.

1.7.12.3 Redundancy

Each server shall be fitted with but not limited to:

- a) Main Applications (like SCADA, Database Server etc) shall have redundant servers.
- b) The Front End computers if separate from the SCADA Servers shall also have redundancy.
- c) Server's basic configuration shall comprise a « hot » switching device allowing replacement of the failing Central Unit with an operational new one and to manage the resources on a redundant way.
- d) The solution proposed by the Contractor must be a fully standard solution belonging to the Contractor's software catalogue.
- e) The switching time i.e. the time during which the system is unavailable to the Power Controller shall not be longer than 15 (fifteen) seconds.
- f) The switching step shall be such that the context shall be kept i.e. no order coming from or data going to the Power Controller shall be lost.