

Vendor Response Sheet – Technical Specifications

1. 3D Fully Immersive Projection and Display System			
Item No.	Specifications	Offered Specifications by Vendor	Remarks
1	A complete solution including projectors, display screens, stereoscopic glasses, mounting structure, tracking system and with all necessary hardware accessories has been quoted by the Integrator/Bidder	Y/N	
2	Detailed drawings of the Projector, Screen and Mirror arrangements to get required display parameters on each screen and viewable area has been submitted along with offer.	Y/N	
3	The Integrator/Bidder has to confirm compatibility of the proposed Projection systems, Screens and tracking devices with each other.	Y/N	
4	The proposed projection-display system and its mechanisms should be totally interconnected with all components within the set footprint / space available.	Y/N	
5	The Integrator/Bidder should also take care on Installation / Integration with all inter connects required for the system.	Y/N	
6	The OEMs for projectors, tracking devices, Screens, VR middleware has to provide an undertaking for the compatibility of their respective proposed product.	Y/N	
7	Available Space at IPR for complete VR system	Height: 5m max	
		Width: 8m max	
		Depth: 8m max	
2. Projection System (Qty: 3 No.)			
8	Image	Brightness: Minimum 6000 ANSI lumens @ 200-240V	
		Uniformity: 80% brightness uniformity or better	

		Rear Projection for Front and Side screens and, Front projection for Floor screen		
9	Number of Projectors	There should be only single Projector for each screen Total : 3 Projectors		
10	Display	Type: The offered display environment needs to be a seamless edge butted display created using a high-resolution 3 chip DLP / Darkchip 3 or better /equivalent projection system		
		Native resolution: WUXGA (1920 x 1200) or higher@ all frequencies from 96 – 120 Hz with 3D stereo sync outputs		
11	Resolution per facet	Two at 1920 x 1200 or better (Front and Floor) One at 1200 x 1200 or better (Side)		
12	Total Resolution	6 Megapixel or higher		
13	Aspect Ratio	Two at ~16:10 One at 1:1		
14	3D Capability	The projectors should be Active stereo3D and should support frame sequential 120Hz input at above mentioned resolution		
15	Light Source	High quality Lamp/ Laser Life of Lamp Source: 1500 Hours or higher		
16	Standard Input	DisplayPort – 2 Nos. or higher Dual-link DVI – 1 No. or higher HDMI – 1 No. or higher 3D Sync Connector		
17	Inputs/outputs, control and networking	RS232 In/Out Ethernet (RJ 45)		
18	Lens	Fixed : 1.1:1 or better		

19	Standard Accessories	Power cables, Display Cables all inter-connectors,3D sync card to maintain proper signal quality		
20	Power	Operating voltage: 230 ± 10% VAC @ 50 Hz		
21	Operating environment	Temp: 10 to 40° C		
22	Warranty	As per Warranty Clause (Section-C-Section 9)		
23	Floor Screen Projection	For the projection on the Floor screen only, a first surface mirror arrangement must be used to fold the light and cut down on the space used for projection throw from the projector to the screen.		
3. Projector Mechanics: (Qty – 3 Sets)				
24	Suitable projector mechanics to hold the projector to be provided.			
25	The material used for this structure should be of adequate tensile strength/ OEM recommended to hold the projector stably without oscillations or vibrations including micro vibrations.			
26	This structure should be with a six degree of freedom base with appropriate control to keep the projectors aligned and allow for movement as per the requirement at site.			
27	The warranty as per Warranty Clause (Section-C-Section 9)			
4. Display Screens (Qty: 3 Nos.)				
28	Screen size and type	One 3.2 to 3.5m x 2 to2.2m soft screen (Front) One 2 to2.2m x 2 to2.2m soft screen (Side) One 3.2 to 3.5m x 2 to2.2m soft screen (Floor)		
4.1 Front and Side Screens with rear projection				
29	Type of material : Flexible Screen (fabric)			

30	Peak Gain : 1.0 or better		
31	Half gain : 60 + Degrees		
32	Minimum Throw Distance : 1.0 X Image Width or higher with fixed lens		
33	No banding should be visible on the edges of the screens It Should be flame resistant		
34	There should be smooth edge butting and pixel matching of the images at the edges of the different screens		
35	When laid flat, there should not be any crease.		
4.2 Floor Screen with front projection			
36	Type of material : Flexible Screen (fabric). The appropriate hard base for the floor on which the fabric will be placed must also be supplied by the Bidder.		
37	Peak Gain: 1.0 or better		
38	Half Gain: 60 + Degrees		
39	Ambient Light Front Reflectance Value: 80% or better		
40	Ambient Light Resistance: Fair		
41	Minimum Throw Distance: 1.0 x image width or higher		
42	No banding should be visible on edges		
43	Should be flame resistant		
44	When laid flat, there should not be any crease.		
45	If user needs to wear any kind of special material shoes, The details must be supplied by Integrator/Bidder		
46	The warranty as per Warranty Clause (Section-C-Section 9)		
5. Screen Mechanics: (Quantity – 3 Sets: 1 set each for front, side and floor screens)			
47	Suitable structure to be provided to hold the screen material in the three sided pattern as mentioned above		
48	Suitable structure with adequate strength/OEM recommended to be provided to hold the screen		

	material in the three sided pattern as mentioned above		
49	Warranty As per Clause (Section-C-Section 9)		
6. Stereoscopic Glasses: (Qty – 20 Nos.)			
50	Sync Operation : IR/RF		
51	Transmission in Clear State : 30 % or better		
52	Residual Light : 15% or better		
53	Contrast : > 200:1 (no Ghosting)		
54	Weight :< 60 grams		
55	The warranty as per Warranty Clause (Section-C-Section 9)		
7. Stereoscopic Emitter: (Qty – 2 Nos.)			
56	IR/RF		
57	Compatible to the stereoscopic glasses		
58	Max Emitting Range : 5m or higher		
59	The warranty as per Warranty Clause (Section-C-Section 9)		
8. Tracking System (Qty: 1 No.)			
60	The tracking should be completely camera based motion tracking.		
61	The tracking system should be compatible to the Real Time 3D Visualization software, Projection systems, Screens and all other quoted items.		
62	The user should not need to wear any kind of detectors or special clothing.		
63	Integrated system should allow typical virtual prototyping operations like grabbing, rotating, moving and placing a 3D object in the virtual scene.		
64	The tracking should come with the supporting controller and software.		
8.1 Tracking Camera (Qty: 4 Nos.)			
65	Infrared optical 6 DOF tracking camera, to work with active/passive markers.		
66	Inbuilt infrared flash (NIR)		

67	Max. tracking distance: up to 5 meter or more		
68	Modulated flash for active marker synchronization		
69	Frame rate : 120 Hz		
70	Standard focal length: f = 3.5 mm or better		
71	Cable for Data out : Fire-wire		
72	Camera Sync: Ethernet		
8.2 Controller (Qty: 1 No.)			
73	Easy remote access through front-end software		
74	Data output via Ethernet		
75	Simple camera and target management		
76	Flexible adjustment of room and body coordinates		
77	Convenient configuration management		
78	Software Interfaces: trackd, VRPN or direct via SDK		
79	Open-Tracker Support and API should be provided.		
8.3 Wireless joystick & Head-Tracking: (Qty – 2 Nos. Each)			
80	6 DOF tracking		
81	Analog/Digital joystick and minimum 6 buttons		
82	Wireless transmission (ISM band)		
83	Protected passive target		
84	The system should allow working with two wireless joysticks, however, only one wireless joystick should be tracked at a particular time for interaction.		
85	The warranty as per Warranty Clause (Section-C-Section 9)		
9. Real Time 3D Visualization software for Virtual Reality Facility (Qty: 1No.)			
86	Display seamlessly the 3D models in Real Time to the proposed VR facility (3 Sided Display System)		
87	No data conversion or limitation for size, resolution, shape or performance during rendering		

88	Display of 1:1 scale models or greater without any sort of data conversion or data loss		
89	Interaction with model in real time using tracked devices		
90	Features	Transparently display the existing 3D application on specified display system	
		No data conversion. No export or import process should be required.	
		No Programming should be required. It should be plug and play type system to visualize any model in immersive 3D	
		Allows natural interaction with the 3D model using a 6DOF Force feedback haptic device (direct interaction with CATIA v5 along with API for manipulation with collision avoidance). However, The haptic device is not in the scope of supply of this tender.	
91	Software Compatibility	No data conversion. No export or import process should be required from the native CAD application Dassault Systems CATIA, DELMIA (compatibility to V5-R23) and 3D-Via Composer	
		No Programming should be required. It should be plug and play type system to visualize any model in immersive 3D	
		3D applications supported should be Dassault Systems CATIA, DELMIA (compatibility to V5-R23) and 3D-Via Composer	
92	Display System Compatibility	Visualization Software should be a middleware solution to display directly any existing 3D applications on 3 Sided Fully immersive display system without making modification	

		of the existing 3D application or importing into a separate application integrating tracking information for immersion and providing a broad range of functionalities and scenarios of use.		
93	Architecture	The Visualization Software should grab the 3D content (3D models) from unmodified existing 3D OpenGL applications, running on one main workstation, and sends it in real time to the cluster of computers connected to the projection system.		
94	Tracking System	The solution should allow to combine information from any the specified tracking system, VRPN compliant, to the VR environment.		
		The solution should enable to create a VR experience by computing the appropriate stereoscopic point of view combining models, stereoscopic projection and head tracking.		
		The Solution should be seamlessly compatible to the proposed 6 DOF tracking system.		
95	Native Applications	The models are displayed exactly in the same way as in the original application. If the application has textures, shaders or post-processing effects (real time compliant), the solution should display them.		
		If the application can play an animation in real time, the solution should display the same animation also in real time.		
96	Stereo Functionality	The solution should enable to add stereo to non-stereo application without modifying the original application.		

97	Navigation Functionality	The user shall have the choice to either navigate in the original application, using the mouse and keyboard inputs, or to use a tracked Navigation device (6DOF wireless joystick/ haptic arm) and navigate in the VR environment.		
		The navigation performance in the VR environment with the solution is accelerated compared to the original application. There is no need optimize or simplify the datasets for the project review. The solution shall integrate and interface with the Navigation device.		
98	Licensing	The licenses must be perpetual		
99	Cluster Compatible	Software should have capability to run across a multiple PC cluster to increase render and computer performance		
100	User Tools	Software should allow user to work on the model from the native application with a navigation device in stereo mode.		
		The following functions should be accessible in the VR environment: bookmarks recording, measurement between points in the model, Object Pick, Collision detection, clipping plane and zoom, snapshot, hide and show part, annotations in stereo image output on the main display screen, animation recording and video exporting.		
		The bookmark functionality should enable the user to record a set of model view positions and to go back to these positions later, during the same session or in another review session.		
		The measurement functionality should enable the user to select two points in the model and measure the distance between those two points.		

		Furthermore the measurement tool should offer the possibility to measure angle between surfaces or diameter of circle shape by adding 3 points on this circle		
		The user can place and move a clipping plane that provides a section of the model (as it is) to see the inside content. Adding more clipping planes should be offered.		
		The zoom functionality should enable the user to change interactively the scale of the model to have a better view of the details. Zooming in or out, decreasing or increasing the scale of the model should be the 2 possible actions. Coming back at scale 1 should be offered easily.		
		The snapshot functionality should enable the user to take a picture of the current model view as image file (jpg, png, gif), that can be saved on the main workstation for paper report.		
		The hide & show parts functionality should enable the user to select interactively some parts of the model and hide them to have a better understanding of the important parts of the model		
		The annotation functionality should provide the user a way to stick interactively virtual flags on the model to point out specific issues seen during the review. This annotation should be saved as VRML files, to be uploaded in 3D native application		
		Animation Recording should enable the user to record his walkthrough and save it as an animation. Such animation can be later replayed with the same 3D model in VR.		
		Software Video Recording should enable the user to record all actions		

		and model navigation and export that as a AVI movie for review debriefing, training or product documentation		
101	Warranty	The warranty as per Warranty Clause (Section-C-Section 9)		
10. 10-Gigabit Ethernet Managed Switch (Qty: 1 No.)				
102	Number of Ports	Minimum 24		
103	Buffer size	3 MB or more		
104	SFP ports	Min. 04 SFP+ 1000/10GBASE-X fiber ports (dedicated)		
105	Operating temperature	0° to 50°C		
106	MTBF (@ 25° C)	500,000 hours or more		
11. Audio System				
107	Inputs/Outputs	<ul style="list-style-type: none"> • 4x HDMI inputs or more • 2x optical digital audio connections or more • 2x coaxial digital audio connections or more • Analogue L/R audio inputs • 1x 3.5 mm connection • Ethernet port control and updates via network 		
108	Supported Audio Format	<ul style="list-style-type: none"> • Dolby Digital, • Dolby Digital Plus, • Dolby TrueHD, • Multichannel PCM 		
109	Amplifier	<ul style="list-style-type: none"> • Rated Output Power: <ul style="list-style-type: none"> - 2Ω Dual (per channel) 550-775W, - 4Ω Dual (per channel) 350-525W, - 8Ω Dual (per channel) 300W, - 8Ω Bridge ~1000W, - 4Ω Bridge ~1,500W. • Crossover frequency: 50Hz to 3kHz • Amplifier Class D 		

		<ul style="list-style-type: none"> • Load Impedance: 2 to 8 ohms per channel in stereo, 4 to 8 ohms in Bridge Mono. 		
110	Surrounding Speakers	<ul style="list-style-type: none"> • Frequency range: 40Hz to 19KHz (-10dB) or better • Power Capacity: 300 W or more with continuous program power • Nominal Impedance: ~8 ohms 		
111	Sub-Woofer	<ul style="list-style-type: none"> • Frequency range: 42 Hz - 200 Hz (-10 dB) • Frequency response: 48 Hz - 120 Hz (± 3 dB) • Power Capacity: 800 W or more with continuous program power • Nominal Impedance: ~8 ohms 		
112	Microphones	2 Nos. of wireless mics		
12. Training				
113	Training at IPR	The training to IPR personnel to be provided by bidder/integrator as per training Clause (Section-C-Section 9)		