INCOIS:PUR:49/2025 **09.01.2025**

Request for Proposal for "Turnkey Design, Development, Supply, Installation, Testing, Commissioning and Integration of Immersive Experience Centre at INCOIS and **GPBAASRI– Comprehensive Package Including VR/AR/Holographic Solutions, Custom Scientific Content Development, Museum-Grade Interior, MEP Works, Technical Infrastructure and 3-Year Warranty &2-year AMC."**

Dear Sirs,

On behalf of the Director, INCOIS tenders are invited in "Two Bid System" (Techno Commercial Bid) from Contractors with appropriate registration, having adequate resources and setup and dealing with similar material like ". The offers, in the prescribed format, shall be submitted through the online Government e-Marketplace at http://gem.gov.in. No tender will be accepted in hard copy, fax, e-mail or any other such means. The intending bidders must be registered with the Government E-Marketplace.

1.	**Name of the work**	**Turnkey Design, Development, Supply, Installation, Testing, Commissioning and Integration of Immersive Experience Centre at INCOISandGPBAASRI - Comprehensive Package Including VR/AR/Holographic Solutions, Custom Scientific Content Development, Museum-Grade Interior, MEP Works, Technical Infrastructure and 3-Year Warranty & 2-year AMC**
2.	**Earnest Money Deposit (EMD)**	Rs.14,23,000/- (Rupees Fourteen lakhs and twenty three thousandonly) as per clause 13 of the General Terms and Conditions under section 10.
3.	**Completion period**	Within 4 Months from the date of receipt of Order
4.	**Due date for seeking clarification**	On or before 1500 Hrs of January 20, 2026
5.	**Pre bid meeting date**	On or before 1500 Hrs of January 23, 2026
6.	**Due date for bid submission**	On or before 1500 Hrs of January 30, 2026
7.	**Bid opening date**	On or before 1530 Hrs of January 30, 2026
8.	**Acceptance of the Order**	Within 01 week from the date of receipt of order

Being a GeM procurement, the bid must be submitted online through the GeM portal, ie, http://gem.gov.in. For any assistance, please contact the help line of the GeM portal. The following officials may also be contacted: Mr. V. Subrahmanyam (email: manyam@incois.gov.in; Phone No. 040 23886022)/ Mr. Dasari Prasad (email: dasariprasad@incois.gov.in; Phone No. 040-2388 6082).

INCOIS may, at its discretion, extend the dead line for submission of bidsbyissuing a corrigendum, inwhichcaseallrightsandobligationsoftheownerandthebidderspreviously subjecttotheoriginaldeadlinewillthereafterbesubjecttothedeadlineasextended.

Postal & Delivery Address	Location Address
Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Govt. of India, "Ocean Valley", Pragathi Nagar (BO), Nizampet (SO), Hyderabad - 500 090	Indian National Centre for Ocean Information Services (INCOIS), **Ministry of Earth Sciences, Govt. of India, "Ocean Valley", Survey No.342/3, Beside ALEAP, Near Pragathi Nagar, Opp. JNTU-Kukatpally, Hyderabad 500 090, Ph. No.040-23886000, Fax No.040-23892910**

Index:

1. Introduction

The Indian National Centre for Ocean Information Servies (INCOIS), an autonomous organization under the Ministry of Earth Sciences, Government of India, provides critical ocean information and advisory services including Tsunami Early Warning, Storm Surge Forecasts, Potential Fishing Zone (PFZ) Advisories, Ocean State Forecasts, and Coral Bleaching / Marine Heatwave Alerts. These services are vital for disaster risk reduction, maritime safety, sustainable fisheries and coastal community welfare.

To enhance public awareness, scientific literacy and disaster preparedness—especially among students, youth and coastal communities—INCOIS proposes to deploy immersive outreach facilities at two locations in Hyderabad:

- **INCOIS's Atal Bhavan (ITCOOcean) –** establishment of a state-of-the-art Immersive Experience Centre on a turnkey basis, covering design, development and integration of immersive technologies, content, interiors and technical infrastructure, along with 3-year warranty.
- **G.P. Birla Archaeological, Astronomical, and Scientific Research Institute (GPBAASRI)–** supply, installation, testing, commissioning and integration of immersive technologies and content for an ocean science gallery being developed by GPBAASRI. All civil, interior and MEP work at GPBAASRI will be executed separately by GPBAASRIinternal team and are outside the bidder's scope, except for necessary technical inputs and coordination.

This tender is issued as a single-package contract covering both locations, to be completed within four (4) months from the date of award and handed over as fully functional, visitor-ready installation. For an overview of the immersive services and INCOIS ocean information products, bidders shall refer to Annexure-II (INCOIS services overview). Bidders are advised to conduct a site visit to better understand the scope of work.

2. Scope of work

2.1 Immersive services and overall objective

The bidder shall design, develop and deploy customized 2D and 3D visual systems based services for immersive experience (including, but not limited to, virtual reality (VR), interactive wall projection, spatial reality displays, multi-touch tables, book projection, immersive projection room, mobile-based AR / WebXR and holography) for the following five INCOIS services/activities (as detailed in Annexure-I):

a) Tsunami Early Warning
b) Storm Surge Warning
c) Potential Fishing Zone (PFZ) Advisory
d) Ocean State Forecast
e) Coral Bleach Alert & Marine Heat Wave Advisory

At the **INCOIS's Atal Bhavan (ITCOOcean)**, these immersive solutions shall be integrated into a world-class Experience Centre featuring museum-grade interior design/layouts/drawings/walkthroughs, professional facility management considerations and universal accessibility standards. The Experience Centre shall showcase INCOIS services through an integrated approach combining physical infrastructure, environmental design (lighting, acoustics, comfort), immersive technologies and interactive content.

2.2 The customized 2D and 3D visual systems for immersive experiences should cater to two different types of devices namely

a) Portable devices that can be easily transported and showcased at exhibitions, scientific events, training, etc.
b) Fixed devices that are to be to be set up at INCOIS and at GPBAASRI Science Museum.

2.3 The bidder shall provide a turnkey solution to a) Identify and supply the essential hardware, software licenses and system components that are incidental to the developed immersive visualization solution b) Customized content development according to the functional & interactive capabilities of the hardware, tailored to the scientific outputs of INCOIS, requiring high level intellect and creative expertise c) Deployment of the solution d) Interior furnishings) Warranty/AMC.

For the INCOIS experience center, the bidder shall also ensure that the facility design and execution comply with universal accessibility standards (such as ADIP/ADA guidelines) so that children, elderly people, wheelchair users and people with disabilities can access and use the exhibits safely and comfortably.

At the GPBAASRI, the bidder shall provide supply, installation, testing, commissioning and integration of the specified immersive technologies and content only. All civil, interior and MEP work at GPBAASRI shall be carried out by GPBAASRI separately (refer also to Clause 2.8).

The contractor is fully responsible for delivery of a turnkey solution, high-quality materials and strict adherence to the schedule.

2.4 The solution should consider future content modifications and upgrades in the design.

2.5 Incorporate AI-based interaction (NLP, gesture recognition, generative AI Q&A) through voice, gesture, and generative media for enhanced interactivity wherever possible.

2.6 The customized content shall be developed in close collaboration with INCOIS team to ensure its scientific integrity as per the requirements specified in the Content Specifications section.

2.7 Solution should include an option for multi-user/multi-player (up to 3 users simultaneous) education, simulation, and role-play to increase awareness of ocean phenomena and disaster response.

2.8 Interior works – summary (detailed scope in Section 4)

For the INCOIS's Atal Bhavan (ITCOOcean), the bidder shall provide end-to-end interior work design and execution on a turnkey basis, including museum-grade space planning and zoning, interior and MEP concepts, signage and graphics guidelines, and 3D visualizations / walkthroughs with maximum capacity of 150 people. The scope shall cover, but not be limited to, flooring and ceiling systems, partition walls and doors, auditorium/classroom platforms and seating, lighting and small power, electrical distribution, HVAC/ducting modifications, networking and IT infrastructure, CCTV and access control, signage and wayfinding, interpretive graphics, mounting/installation hardware, wall finishes and all miscellaneous associated works, as per the bidder's approved layout and concept design and in compliance with NBC/IS and relevant international museum standards.Immersive experience center must include a permanent public-address audio system designed for museum and public-use environments with commercial-grade speakers and amplifiers with zoning and paging capability to cover all exhibition areas, integrated into the interior works and AV system design.

The bidder shall engage only qualified and experienced professionals/agencies (e.g. registered architects, licensed MEP engineers and specialised interior/execution contractors) for all design, interiors, MEP and allied works, and shall submit credentials of such professionals/agencies as part of the Technical Bid. A single lumpsum amount shall be quoted for the INCOIS interior works, with a detailed Bill of Materials (BoM) and line-by-line inventory (description, specifications, make, unit, quantity, unit rate and total) to be provided along with the Technical and Financial Bids.

For the GPBAASRI, the bidder's scope shall be limited to supply and installation of the equipment & placement. All physical civil, interior and MEP execution at GPBAASRI will be carried out separately by GPBAASRI.

Note: The detailed and itemised scope for interior works is provided in Section 4 – Details of Interior Works (Lumpsum Basis), which shall be read in conjunction with this clause.

2.9 The proprietary rights of the VR environment design files (with or without the base software, if any, on which they were developed) should be transferred to INCOIS to enable further upgrades to the system later.

2.10 Bidders to submit a detailed Gantt chart or timeline in the technical bid, covering design, content creation, hardware procurement, interior fit-out installation, testing and training. This timeline should be indicated with the project completion target and highlight milestone dates (e.g. design sign-off at week 2, content completion at Week 6, all hardware delivered by Week 8, interior fitout completion by week 10, installation and commissioning by week 12) etc).

2.11 The entire work is covered under 3-year warranty period from the date of final acceptance. During the 3-year warranty period, the vendor must provide technical support including system monitoring, user assistance and monthly preventive maintenance.

2.12 The CAMC price must include continued technical support, preventive maintenance, firmware/content updates and replacement of worn parts by deploying onsite maintenance and technical support. The CAMC Payments should be quarterly, conditioned on submission of maintenance supports.

3. Project Specifications

3.1 Immersive Experience Device Specifications

- The following is a list of proposed devices for customized immersive experience development.
- At the time of supply, the configuration of the supplied devices should be the same or better than the device specifications mentioned below.
- All devices shall be commercial-grade construction, public-use duty cycle (24/7) and compliance with all the applicable standards (e.g., CE, FCC, BIS etc.).

3.1.1 Type-I VR Headset (Consumer Grade)

Type-I VR Headset (Consumer Grade)	**Make and Model: <To be Filled >**

Parameter	Specifications	Compliance (Yes/ No)
Headset		
Resolution	2064 x 2208 per eye or higher(4K+ infinite display)	
Refresh rate:	90Hz or higher	
Chipset	Latest-generation XR2 or equivalent chipset with dedicated AI accelerator	
Field of View (FoV)	110 degrees or higher (Horizontal)	
IPD (Interpupillary Distance) Range	58-71 mm	
Peak Pixel Density	20 PPD or higher	
Passthrough	High-fidelity colour passthrough	
Storage	512 GB or Higher(to carry more content for exhibitions etc.)	
RAM	8 GB or higher	
GPU	Yes	
Controllers	6 DOF	
Controller Type	Touchpad control	
Multiplayer	Limited support	
Battery Life	2 to 3 hours	
Dimension	Without headstrap: 165 x 84 x 62 mm or higher, With headstrap: 234 mm x 193 mm x 173 mm or higher	
Weight	500g with head strap	
Connections	Atleast one USB 3.2 Type C port, Bluetooth 5.2 or equivalent	
Sensor Technology	Accelerometer, Gyroscope, Proximity, Magnetometer	
Audio	3D spatial audio with 3.5 mm audio jack for headphones and output to external audio devices.	
Setup	Plug-and-play. Training should also be provided for steps to be followed during transportation (portability requirement) for both standalone and PC based VR modes.	
Others		
Proposed Quantity	24	
Flight case/Carrying cases	To be included	
Use case	Transportable to exhibitions/events as well as INCOIS/GPBAASRI experience centres for single players to experience completely immersive 3D simulation in a 3D environment.	
Accessories	Original Manufacturer accessories to be included. At least two streaming cables for PC VR connectivity.	
Reference	Meta Quest 3	

3.1.2 Type-II VR Headset (Enterprise Grade)

Type-II VR Headset (Enterprise Grade)	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Headset		
Resolution	2448 x 2448 per eye or higher (Effective 5K resolution)	
Refresh rate:	90 Hz or higher	
Chipset	Latest XR-2 class chipset or better	
Field of View (FoV)	120 degrees or higher (Horizontal)	

IPD (Interpupillary Distance) Range	57-72 mm hardware adjustable (automatic)	
DisplayPort Support	Yes	
Storage	256 GB or Higher	
RAM	12 GB or higher	
GPU	Yes	
Controllers	6 DOF with precision tracking	
Passthrough	Depth-correct colour passthrough	
Multi-player	Support with shared space	
Battery Life	2 to 3 hours	
Enterprise Grade Security	To be included	
Enterprise Level Precision/Spatial Accuracy	High	
Dimension	Without headstrap: 165 x 84 x 62 mm or higher, With headstrap: 234 x 193 x 173 mm or higher	
Weight	700g with head strap or higher	
Connections	Atleast one USB 3.2 Type C port, Atleast one USB 3.2 Type C port with DisplayPort support (for advanced content streaming), Bluetooth 5.2 or equivalent	
Sensor Technology	Tracking cameras x 4 Eye-tracking cameras x 2 High-resolution full color passthrough cameras x 2 G sensor Proximity sensor Depth sensor Infrared floodlight Gyroscope	
Audio	Dual microphones with noise cancellation and echo cancellation Dual driver with directional speaker design x 2 Minimized external sound leakage 3.5 mm audio jack output	
Setup	Plug-and-play. Training should also be provided for steps to be followed during transportation (portability requirement) for both standalone and PC based VR modes.	
Others		
Proposed Quantity	6	
Use case	To be used at INCOIS Experience Centre for showcasing higher quality and multiplayer shared space content. It is also envisaged to be mainly used with PC-based VR through advanced streaming options via DisplayPort technology etc.	
Accessories	Original Manufacturer accessories to be included. Atleast two USB streaming cable for PC based VR display. Atleast two DisplayPort or other better connectivity cable for PC based VR display.	
Reference	HTC Vive Focus Vision	

Reference image for a portable VR headset

3.1.3 VR Supporting Laptop business class OEM built (To enable Laptop/PC based VR for high fidelity content)

VR Supporting Laptop	**Make and Model: <To be Filled>**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Processor	Intel Core i7 14th Gen equivalent or better	
Motherboard	OEM motherboard	
Memory	Min 16 GB DDR4 RAM	
Graphics	NVidia GeForce GTX 5080 (or latest) with 16 GB or better	
Network	Min one 10/100/1000 interface	
Audio	Integrated Sound and Audio	
Storage	1 TB SSD	
Ports	Atleastone USB 3.0 compatible Type-A port Atleast two 3.2 compatible ports Atleast one DisplayPort port from dedicated GPU	
Display	14″ or above	
Others		
Proposed Quantity	4	
Use case	To be used either at exhibitions or INCOIS experience centre for high fidelity content that may not be achievable through standalone VR.	
Accessories	Original Manufacturer accessories to be included.	

3.1.4 3D immersive VR Visualization with Interaction

3D immersive VR Visualisation solution with interaction	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Projection		
Resolution	True Native 4K resolution(4096 x 2160) or higher resolution in 2D as well as Active 3D without any pixel shift or wobulation or scaling techniques.	
Projector Type/Technolo	DLP Digital projection without using any Colour Wheel or Phosphor Wheel inside the projector to generate colours.	

gy		
Brightness	More than (>) 6000 ANSI Lumens	
Brightness Uniformity	> 90%	
Light source life time	50000 hrs or more (while running in full power mode	
3D Support	Active Stereoscopic 3D and Passive Stereo compatible with polarize filters (not inclusive)	
Input source resolution & Refresh rate	Projector should be able to support input sources up to 4092 x 2160 @ 240Hz	
Input ports	Min 3x DP1.4 & 1x HDMI 2.0 input ports as well as 3D Stereo sync In/Out	
Screen	Motorized Flexible front/rear projection suitable screen (with suitable frame) including ceiling mount and screen encloser.	
3D projection distance	Less than 1.5 meter away from the projection screen wall.	
Orientation	360-degree rotation	
Interactivity	To be provided with wand or any suitable controller(selection and navigation inside the scene with 6DOF including buttons)	
Number of people to be supported	Up to 25 people or above	
Setup	The projector along with glasses/interactive controllers, supporting systems, networking/electrical equipment need to be setup by the vendor at the specified destinations. Training also needs to be provided on basic troubleshooting.	
Stereoscopic Glasses		
Tracking	Required to enable instructor or moderator led sessions	
Active Glasses Tracking range	Up to 10 metres or more	
Active Glasses Battery Range	8 hours or more	
Refresh Rate	Compatible with all refresh rates up to 240 Hz (96, 120, 144, 192 Hz)	
Others		
Proposed Quantity	2	
Audio System	Suitable audio system (tower speakers/surround speakers/sub-woofer) configuration to be provided for enhanced realism and an exhilarating experience.	
Use case	The interactive wall will be set up at the INCOIS experience centre and GPBAASRI where instructor-led sessions can be done for up to25 people.	
Dimensions	The screen sizes and projector setup need to be customized depending on the space availability. For INCOIS experience centre, the room size is around 8m x 8m; proposed screen size is 15ft (W) x 8.4ft (H). For Science Museum, the proposed room size is around 6m x 6m, with proposed screen size of approximately 12ft (W) x 6.75ft (H)	
Accessories	Original Manufacturer accessories to be included. Any mounting accessories required for projector installation should be included.	
Electricals	The vendor shall supply, install & commission a suitably rated UPS as part of the Proposed VR Solution package for GPBAASRIsite. The UPS shall provide a minimum of 30 minutes battery back up at full rated KVA of UPS system. At no point of time UPS Loading should not exceed 80% of its rated capacity. UPS shall be of online double conversion type with suitable protections (overload, short circuit, surge,	

	under/over voltage etc). UPS shall include SMF batteries designed for extended backup life.	
Reference	Axiom Holographic Wall or Custom-built interactive wall projection or M/s BARCO make or M/s Norxe make	
Supporting System		
Processor	Intel Xeon Gold 6526Y Processor (2.8 to 3.9GHz 16 core), vPro enterprise. equivalent or better with Windows 11 Pro OS	
Motherboard	OEM motherboard	
Memory	Min 128 GB DDR5 RAM	
Graphics	NVidia RTX 5000 (latest in the series) ADA Generation (32GB GDDR6ECC, 4 DisplayPort 1.4) Graphics Card	
Display Monitor	32″ 4K monitor from same as system OEM	
Network	Min one 10/100/1000 interface	
Audio	Integrated Sound and Audio	
Storage	1 TB SSD	
Ports	At least two USB 3.0 compatible ports and at least 2 USB C type 3.2 compatible ports	
Accessories	Original Manufacturer accessories to be included.	

Reference image for an interactive 3D immersive virtual reality solution

3.1.5 Portable Spatial Reality Device (and Supporting Laptop)

Portable Spatial Reality Device with Supporting Laptop	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Device Characteristics		
Screen Size	27 inches or above	
Aspect Ratio	16:9	

Glasses-free 3D	Yes	
Display Area	593.2 mm x 332.8 mm	
Brightness	400 cd/m2 or better	
Contrast Ratio	1000:1 or better	
Resolution	3840 x 2160 (4K UHD) or better	
Colour Support	1.07 billion Colours (8-Bit+FRC)	
Response Time	14 ms or better	
Refresh Rate	60 Hz or better	
Setup	The spatial reality device along with the necessary supporting system, networking, and electrical equipment needs to be setup at the specified destination. Training should be provided for transportation (portability) and for basic troubleshooting.	
Interactivity	Can be done through gesture-based touch, game controller, eye-tracking and viewer switching, PC based control. Content needs to be customized for these interactive capabilities.	
Others		
Proposed Quantity	3	
Use case	To be used for exhibitions, INCOIS experience centre, and GPBAASRI.	
Accessories	Stand and other original manufacturers provided accessories.	
Carrying Case	Required for transporting safely to exhibitions etc.	
Reference	Sony Spatial Reality ELF-SR2 with supporting laptop for high-fidelity Glass-free 3D viewing or equivalent	
Supporting Laptop		
Processor	Intel Core i7 14th Gen equivalent or better	
Motherboard	OEM motherboard	
Memory	Min 32 GB DDR5 RAM	
Graphics	NVidia GeForce RTX 5080 (or latest) with 16 GB or better	
Network	Min one 10/100/1000 interface	
Audio	Integrated Sound and Audio	
Storage	1 TB SSD	
Ports	At least two USB 3.0 and at least two 3.2 compatible ports	
Accessories	Original Manufacturer accessories to be included.	

Reference image for spatial reality display

3.1.6 Portable 3-Sided Pyramid Holographic Display

3D Pyramid Holographic Display	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Projection		
Viewing Angle	3 Sided	
Resolution	Full HD 1920 x 1080 or better	
Display Size	23″ or better	
Dimensions	22 x 17 x 14 inches or 32 x 22 x 17 inches	
Aspect Ratio	16:9	
Interactivity	Through HDMI Input, Fusion Sync	
Setup	Plug-and-play. The device along with necessary networking/electrical equipment needs to be setup at the specified destinations. Training is to be given regarding the steps to be taken during transportation. Training is also to be provided for basic troubleshooting.	
Others		
Proposed Quantity	2	
Use case	To be used for exhibitions as well as at GPBAASRI.	
Connecting System	Laptop to be connected (with suitable specs) if required	
Accessories	Original Manufacturer accessories to be included. Stand or mounts are to be included as necessary.	
Carrying Case	1 carrying case required	
Reference	RealfictionDreamoc HD3.2 or HoloPixelo 3-Sided Pyramid Holographic Device	

Reference image for a 3-Sided Pyramid Holographic Display

3.1.7 4-Sided Pyramid Holographic Display

4-Sided Holographic Display	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Projection		
Viewing Angle	4 Sided	
Resolution	4K: 4320 x 3840 (1920x1920 pixels pr side) or better	
Display Size	Dual65″ screens or similar setup	
Dimensions	7.74ft x 7.74ft x 5.61 ft or4.8 ft x 4.8 ft x 5 ft	
Interactivity	Through HDMI input	
Content Control	IPAD for Content Control	
Setup	Professional Setup required with logistics and space planning Training is to be provided for basic troubleshooting	
Others		
Proposed Quantity	1	
Use case	To be used at INCOIS experience centre	
Connecting System	Laptop to be connected (with suitable specs) if required	
Accessories	Original Manufacturer accessories to be included.	
Reference	RealfictionDreamocDiamond or HoloPixelo4-Sided Pyramid Hologram Display	

Reference image for a 4-Sided Holographic Display

3.1.8 Magic Book Projection

Magic Book Projection	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Technical		
Number of pages	10 interactive pageswith durable, high-quality material	
Dimensions	18 x 21 inches (width x length)	
Display Technology	Hidden projector to display content on pages	
Interactivity	a) Embedded sensors to provide touch and page recognition b) Additional interactions are based on touch.	
Brightness	5000 Lumens	
Contrast Ratio	3,000,000:1	
Native Resolution	1920 x 1080	
Accessories	All the original manufacturer accessories are to be provided. Any mounting accessories needed for projector installation should be included.	
Setup	The required projector and the device along with necessary networking/electrical equipment need to be setup at the specified location. Training should be provided for basic troubleshooting.	
Others		

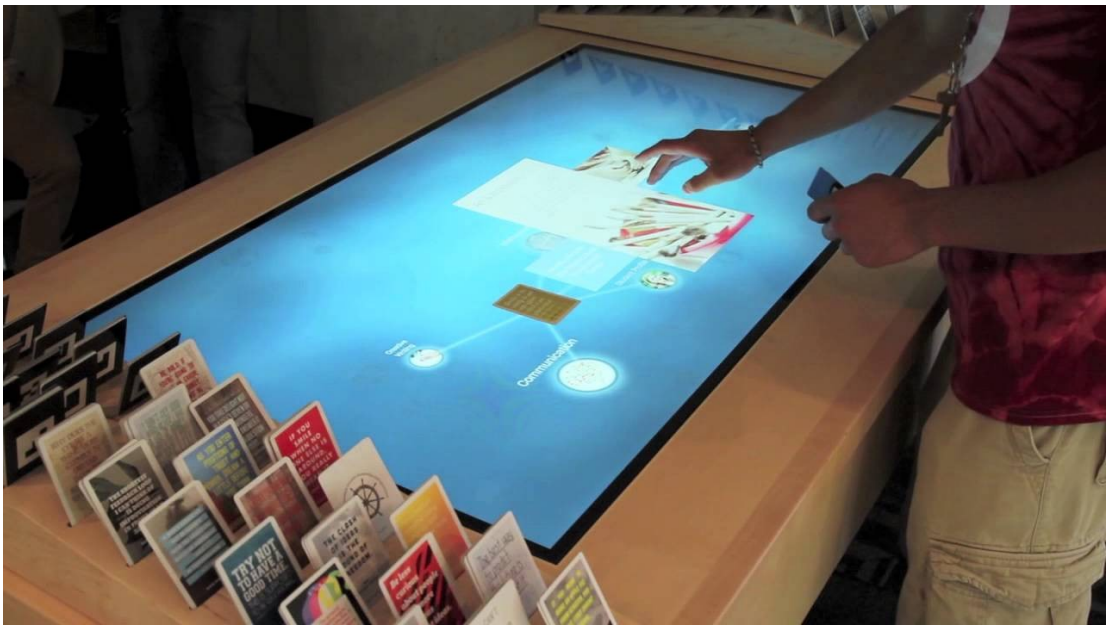
Proposed Quantity	1	
Use case	To be set up at the INCOIS experience centre.	
Reference	Custom-built	
Supporting System (In-built)		
Processor	Intel Core i7 14th Gen equivalent or better	
Motherboard	OEM motherboard	
Memory	Min 16 GB DDR5 RAM	
Graphics	NVidia GeForce RTX 3080 or better	
Storage	1TBHDD, 500 GB SSD	
Operating System	Windows 11 Pro	

Reference image for a magic book display

3.1.9 Interactive Multi-taction table

Multi-taction interactive table	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
MultiTaction Display System 55"		
Viewing Angle	4 Sided	
Resolution	4K or better	
Display Size	55″ 16:9 Wide	
Display colors	16.7 million	
Pixel response time	8ms grey to grey	
Refresh rate	60 Hz	
Dimension	1127 x 724 x 84 mm (W X H X D) approximately	
Viewing Angle	178 degrees or better	

High Dynamic Range (HDR)	HDR10, HLG	
Inputs	LAN (1), HDMI (4), USB ports (2)	
Sensor	Light	
Audio	10W + 10W Open Baffle Speaker, Dolby Audio format, DTS digital surround	
Smart Tagged objects for Interactive Table Display		
Number of objects	6 or more smart tagged objects consisting of an icon fixed on a base	
Base Size	5-7 cm diameter or customisable	
Icon Material	Acrylic or 3D printed plastic or equivalent as finalized by INCOIS team during content design	
Icon Design	To be custom designed as finalized by INCOIS team during content design	
Recognition Method	Unique identifier on the object for tracking and interaction	
Display System with Wall Mounting Kit		
Screen Size	218.44 cm (86")	
Aspect Ratio	16:9	
Native Resolution	3840 x 2160 (UHD)	
Brightness	500 cd/m2 (500 nits)	
Dynamic CR	1,000,000:1	
Viewing Angle	178 x 178 (H x V)	
Refresh Rate	120 Hz	
Audio System	2 x 60W + Amplifier (120W)	
Supporting System		
Processor	Intel Xeon w7-3465 (2.5 GHz, up to 4.8 GHz, 28 core) equivalent or better	
Motherboard	OEM motherboard	
Memory	Min 64 GB DDR5 RAM	
Graphics	Nvidia RTX 5000 (latest in the series) ADA Generation(32GB GDDR6ECC, 4 DisplayPort 1.4) Graphics Card	
Storage	1TB SSD	
OS	Windows 11 Pro	
Others		
Proposed Quantity	1	
Use case	To be set up at the INCOIS experience centre.	
Accessories	All mounting and assembly accessories needed for the table and the projected system needs to be provided.	
Setup	The interactive touch table, the wall mounted display system, the smart tagged objects, necessary mounting accessories, networking/electrical equipment need to be setup. Training should be provided for basic troubleshooting and operation.	
Reference	Custom-built	



Reference image for an interactive multi-taction table

3.1.10 Immersive Projection Room With 360⁰Visuals and Spatial Audio

Immersive 360 deg projection on 4 walls and the floor is required within a 20ft x 20ft room. Vendor shall provide high resolution projection on all four walls (front, sides & back) with images of each wall being 20ft wide. In addition, the floor area enclosed within these walls (i.e. a floor area of 20ft x 20ft) should also be projected completely by using projectors.

Immersive Projection Room with 360⁰ Visual and Spatial Audio	**Make and Model: <To be Filled >**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Projection Technology		
Display System	Latest 3-Chip LCD/DLP	
Native Resolution	1920 x 1200	
On-Screen resolution	Up to 3840 x 2400 via Pixel-Shift technology	
Supported Resolutions	Maximum: 4096 x 2160	
Brightness	White: 10,000 Lumens (ISO) Colour: 10,000 Lumens	
No. of Projectors	6 projectors- LensUltra Short Throw (0.25 – 0.5: 1)	
Brightness Uniformity	>85%	
Light source lifetime	Up to 30,000 hours or more	
Aspect Ratio	Native: 16:10 with support for 16:9 or better	
Dynamic Contrast Ratio	2,500,000:1	
Light source type	Laser	
Colour Depth	10-Bit (1.07 billion Colours)	
Power consumption	Max 600W per projector	
Mounting	Ceiling mounted	

Lens type	Suitable lenses to reduce the shadow on front, back and side walls.	
Lens	Ultra Short Throw (0.25 – 0.5: 1)	
Ports	Min 1x HDMI, 1x DVI, Display port x 1, RS232 IN/OUT X 1, LAN X 1, Remote IN/ OUT X 2, USB DC Out x 1	
Orientation	360-degree view	
Interactivity	Some interactive elements could be added in the content. For e.g., wave activation gesture (triggers waves etc), floor based interaction (step on a location to show its 360^0 environment on walls), marker cards, interactive quizzes (answers control next scene or animation), voice interaction (narrative branching or voice commands), Users could walk to different zones triggering different levels of risks, move to highlighted areas to unlock story chapters, heatmap-based interactions etc. are few options	
Content &Media Server The solutions should include Media Server Hardware as well as software to playback the 360 deg content in this immersive setup.		
Hardware	High-performance workstation or server PC (Multi-coreCPURyzen 9/Intel i9 or Xeon), Modern High-end GPUs (Nvidia RTX or better) with minimum 6 high resolution outputs, 32 GB+ RAM, 2TB+ SSD.	
Processing Features	Geometry correction, Media Server Software (E.g. Disguise, Touch Designer etc.), Edge blending & Warping, Adjustable gamma/black level in overlap regions, Frame synchronization.	
Outputs	6x DisplayPort/HDMI or more supporting up to 4K resolution	
Software	Capabilities: Multi-display/multi-projector playback. Content formats: High-bitrate video (H.264/H.265 or ProRes)	
Others		
Proposed Quantity	1	
Audio System	Spatial audio design with full-range surface mount speakers, subwoofers, Audio DSP, Power amplifier etc. as appropriate to produce a high-fidelity audio content. Speakers should provide min 90-100 dB continuous output at listener position without distortion.	
Control System	Central Control PC or Tablet based control/AV Control Processor with Network based projector power on/off, Media Server playback control, Lighting Presets.	
Networking	Gigabit Ethernet for projectors, media server, audio and lighting controller, Wireless Access Points, Network Switches etc. as required.	
User interface	Simplistic User Interface with one-touch Startup/Shutdown sequence, Preset Scene Selection, Volume and Lighting Controls etc.	
Use case	The immersive projection room needs to be setup at INCOIS experience centre.	
Dimensions	Immersive 360-degree projection on 4 walls and the floor is required within a 20ft x 20ft room. Vendor shall provide high resolution projection on all four walls (front, sides & back) with images of each wall being 20ft wide. In addition, the floor area enclosed within these walls (i.e. a floor area of 20ft x 20ft) should also be projected completely by using projectors. It is expected to accommodate around 8 to 10 people.	
Setup	Customized setup is to be done with multiple wall and floor projections, surface preparation (Smooth/Matte/Neutral White etc.), lighting control etc. is to be done.	
Accessories	Original Manufacturer accessories to be included. Any mounting accessories, HDMI extenders, Cable management equipment etc. to be included in the setup	

Reference image for an immersive projection room with 360^{0}Visual and Spatial Audio

3.1.11 Other low-cost immersive experience content

- **Mobile based AR apps**
- **Progressive WebXR Content:** Experiences that run directly in browsers on mobile/desktop without installation, ensuring device-agnostic access and easy scalability.
- **360° Interactive Videos or Panoramic Tours:** Low-cost alternatives for immersive storytelling using simple gyroscope-based navigation on smartphones.
- **QR/URL Triggered AR Experiences:** Quick-access lightweight AR that can be embedded in posters, info boards, or custom designed materials like carpets etc.
- **Gamified or Interactive Learning Modules:** Simple interactions like quizzes, hotspots, or object manipulation to engage users at exhibitions or public displays.

3.2Content Specifications

- **CS-1.1**: Content needs to be developed for 5 INCOIS services as **independent modules** with interaction and spatial narration. The 5 INCOIS services include
    - Tsunami Early warning
    - Storm Surge Warnings
    - Potential Fishing Zone Advisory (PFZ)
    - Coral Bleaching & Marine Heat Wave Services (CBAS)
    - Ocean State Forecasts (OSF)

  Sample virtual reality scripts for the 5 INCOIS services are provided in Annexure – I
- **CS-1.2**: The materials and content should be suitable for a diverse range of stakeholders, including school and college students, researchers, fishers, policymakers, and the public.
- **CS-1.3**: Content of **varying durations – long version (3-4 minutes) and short version (1-2 minutes)** is to be developed to accommodate different audience types.
- **CS-1.4**: Customized content should be **designed and developed in close consultation with the INCOIS team to ensure scientific accuracy,** interactivity, and immersive storytelling.
- **CS-1.5**: The customized content should be designed and developed considering the **varying display capabilities, functionalities, and interactivity of the different hardware devices proposed**. Compatibility with diverse workstations and platforms must be ensured, wherever applicable. For example, multi-player content can be developed using the enterprise-grade VR which supports precision tracking; high-fidelity content can be developed using laptop GPU rendering, etc.
- **CS-1.6**: Sample requirements for customized content based on device capabilities and interaction as below
    - **Consumer-Grade VR Headset:** Content quality and length need to be customized for standalone mode versus laptop-based mode.

- **Enterprise-Grade VR Headset:** Content quality and length need to be customized to suit the better performance and passthrough characteristics of the device. Multi-player shared space content may also be designed and developed for these devices.
- **Laptop/PC based VR render:** Content quality and length need to be customized to utilize the higher processing power of the laptop GPU rendering. High-fidelity content can be developed for this mode.
- **3D Stereoscopic Immersive Visualization:** Content quality, interactions, effects and length need to be customized to make it suitable for the interactive wall setup.
- **Portable Spatial Reality Device:** Content quality, interactions, effects and length need to be customized to make it suitable for this device.
- **3-Sided Pyramid Holographic Display, 4-Sided Diamond Holographic Display:** Custom Content (Mainly interactions and dynamic effects) needs to be designed specific to the capability of this device.
- **Magic Book Projection Display, MultiTaction Interactive Table:** Customized interactive content is designed and developed for this device according to the layout.
- **Immersive Projection Room with 360^0Visual and Spatial Audio:**
    - Customized content with seamless edge-blending, and distortion-free projection, optimized camera angles, transitions and movement speed to avoid visual discomfort to users.
    - Scenes must be authored in 360° or multi-plane stitched formats to preserve spatial perspective across surfaces. Visual assets must be developed at sufficiently high resolution (4K+ per channel or equivalent panoramic resolution) to maintain clarity at large projection scales.
    - Color grading and dynamic ranges should be optimized.
    - Group viewing dynamics should be enabled to accommodate simultaneous participants.
    - Dynamic effects (particle flows, environmental simulations, waveforms, topography animations, etc.) must be designed so they appear continuous across surfaces, including floor projections, enhancing the feeling of presence and immersion.
    - Minimal Content interactions, hotspots, and triggers must be customized to work reliably with the room's tracking system (camera-based, sensor-based)
    - Audio should include spatial and directional cues synchronized with visuals.

- **CS-1.7:** Content should use **high-resolution 3D models, realistic textures, and fluid animations**.
- **CS-1.8:** Spatial and ambient sound design should **enhance realism**; Voiceovers (Multi-language) should be clear and suitable for different age groups.
- **CS-1.9**: The following additional features can be included
    - **Gesture-based Interactions:** Trigger warnings, open datasets, zoom into data layers
    - **Voice-based Narrator:** Explains Ocean phenomena, guided simulation
    - **Integration of AI elements like NLP & Generative AI based interaction/Q&A**
    - Multi-language support
    - Hand-tracking and controller-based navigation through appropriate controllers included in the proposal
    - Time-lapse Playback: View ocean changes over time (e.g., coral bleaching, tsunami progression)
    - Impact assessment mode
    - Tutorials
    - Knowledge of checkpoints/quizzes, contextual popups, etc.
    - Historical events case studies.
    - Impact assessment mode
    - **Data Visualizations:** Real-time or simulated forecast overlays
    - **Integration with tablet:** Control Panel of the display on all hardware can also be made available through table wherever possible

3.3Technical Specifications

3.3.1 System Requirements

- **TS-3.3.1.1**: Two versions of the VR content are to be developed with varying content quality for **standalone VR** and **laptop/PC based rendering**.

- **TS-3.3.3.2:** The software shall maintain a minimum **frame rate of 90 FPS** under all scenarios, with minimal motion-to-photon delays to avoid simulator sickness.
- **TS-3.3.3.3:**The application shall use a supported real-time 3D engine, such as Unity, Unreal Engine, or another equivalent platform, along with a compatible VR SDK that provides the necessary VR integration features.

3.3.2 3D Model, Textures& Lighting

- **TS-3.3.2.1:** All 3D models and assets must be of high quality
- **TS-3.3.2.2:** Textures must be of high resolution (2K or better based on different device capabilities)
- **TS-3.3.2.3:** Multiple texture maps must be used to make the models more realistic like – Albedo, Normal, Metallic, Roughness, Occlusion, Height,etc.
- **TS-3.3.2.4:** Lighting should include baked and real-time lighting as per the content requirement

3.3.3 Audio & Sound Design

- **TS-3.3.3.1:** Environmental Integration: Audio should reflect virtual surroundings (echoes, muffling).
- **TS-3.3.3.2:** Dynamic Layering: Ambient sounds, effects, and triggered sounds should be layered dynamically based on context.
- **TS-3.3.3.3:** Head Tracking & Movement: Audio cues must adapt to the user's orientation and position for realism.
- **TS-3.3.3.4:** Multiple Sound Techniques: Support binaural, ambisonics, or other 3D audio formats.

3.3.4 Interaction Framework

- **TS-3.3.4.1:** The application shall implement a **physics-based XR interaction framework** (e.g., Unity XR Interaction Toolkit or equivalent) to support intuitive object manipulation including grabbing, throwing, and precise placement with haptic and visual feedback.
- **TS-3.3.4.2:** User interfaces shall use **VR-native floating panels** with 3D depth and gesture-enabled interactions; traditional flat 2D menus shall be avoided to improve immersion and usability.
- **TS-3.3.4.3:** Educational and informational content shall be accessible via multiple interaction modalities including **gaze-based selection, hand gestures, and controller inputs**, allowing natural and accessible user triggers.
- **TS-3.3.4.4:** The system shall provide clear visual and auditory affordances for all interactive elements to guide users effectively in the virtual space.
- **TS-3.3.4.5:** Interaction components shall support cross-platform XR devices ensuring adaptability for different hardware capabilities and input methods.

3.3.5 Data & Content Management

- **TS-3.3.5.1:** The application shall include **offline datasets** for case studies.
- **TS-3.3.5.2:** The software shall allow **parameterized input** for interactivity.
- **TS-3.3.5.3:** All content shall be **modular** to allow future updates.
- **TS-3.3.5.4:**Application can also provide an option to integrate **live data** wherever possible.

3.3.6 Testing & Quality Assurance

All equipment and systems must undergo thorough functional testing, quality assurance, and final commissioning in the presence of INCOIS committee. Dry runs and simulations must validate the accuracy of the integrated visitor journey.

- **TS-3.3.6.1:**The immersive system shall provide real-time, responsive interaction with stable visual output suitable for instructional and experiential use.
    a) During normal operation and live demonstrations:
    Head or body movements shall result in immediate and smooth visual updates without noticeable lag.
    b) User interactions (touch, controller, or gesture) shall produce perceptible system responses without distracting delay.

c) The visual output shall remain stable, free from noticeable blur, judder, jitter, or tearing during motion.
d) Multi-display or spatial projection outputs shall remain temporally synchronized and visually coherent.
e) Compliance shall be verified through live demonstration under representative workload conditions.

- **TS-3.3.6.2:** The testing specifications for different devices are as listed

a) VR Headsets / AR Glasses

- Demonstrate reliable tracking, boundary awareness (where applicable), audio-visual synchronization, and input device responsiveness within a 360° usage area.
- Demonstrate user comfort during navigation and interaction, including ease of use, depth perception, and intuitive interface controls, based on feedback from multiple users.
- The device shall operate within manufacturer-recommended thermal and safety limits during extended use.
- The system shall maintain stable performance under typical variations in lighting, ambient noise, and user movement encountered in laboratory or exhibition environments.

b) Spatial Reality Displays

- The display shall provide stable and convincing depth perception across intended viewing angles.
- Visual quality, including brightness, contrast, and colour appearance, shall be suitable for use under typical ambient lighting conditions.
- Performance shall be verified through live demonstration.

c) Holographic Projection Systems (3-sided / 4-sided)

- Demonstrate consistent visual alignment, transparency, and coherent volumetric appearance across multiple viewing angles.
- Demonstrate uniform visual continuity across edges and surfaces, with stable imagery and smooth animation transitions during operation.

d) Interactive MultiTaction table

- Demonstrate responsive multi-touch and gesture interaction with multiple concurrent users.
- Demonstrate consistent projection alignment, coherent depth perception, and reliable touch interaction across the usable surface area.
- The system shall operate within manufacturer-recommended ergonomic and safety limits, including surface temperature and illumination characteristics.

e) 3D Stereoscopic Projected Immersive Systems

- Demonstrate stable stereoscopic visual performance suitable for immersive viewing, with smooth motion and consistent frame presentation during continuous operation.
- Demonstrate viewer comfort during extended 3D viewing, with minimal visual fatigue or discomfort under normal operating conditions.
- Active stereoscopic eyewear shall support practical usage duration and reliable synchronization within the intended viewing area.
- The system shall maintain stable thermal and synchronization performance during prolonged 3D playback.
- Acoustic output during operation shall be suitable for indoor immersive environments.
- The system shall recover automatically and restore stereoscopic output after temporary signal or power interruptions within suitable time limits as defined by INCOIS committee/team.

f) Immersive Projection Room with 360^0 Visual and Spatial Audio

- Demonstrate visually uniform projection with seamless blending across all display surfaces, maintaining consistent visual continuity during dynamic content playback.
- Demonstrate accurate geometric alignment and image mapping across all projection surfaces.
- Demonstrate stable and synchronized visual performance across multiple projectors during continuous playback of immersive content.
- Demonstrate viewer comfort and immersion during extended viewing of 360° content, with minimal visual or motion-related discomfort under normal operating conditions.
- Demonstrate effective audio-visual synchronization, including spatial audio cues aligned with visual content.
- The system shall maintain stable operation during prolonged use without perceptible degradation in visual or audio performance.
- The system shall be capable of automatically restoring normal operation after temporary signal, network, or power interruptions, without requiring extensive manual recalibration within the time limits required by INCOIS committee/team.
- Acoustic output of projection and audio equipment shall be suitable for indoor immersive environments.

- **TS-3.3.6.3:**Vendor shall also demonstrate test cases for future content updates/integration, as applicable.

3.3.7 Security & Compliance

- **TS-3.3.7.1:**The immersive applications shall operate **without any dependency on external internet connectivity** during runtime.
- **TS-3.3.7.2:**No**personal user data**, biometric information, or identifiable telemetry shall be collected or stored. Any analytics or usage statistics shall be **fully anonymized** and retained locally.
- **TS-3.3.7.3:**The entire system stack — hardware, firmware, OS, middleware, and application layer — shall comply with the latest **Government of India Cyber Security Guidelines** (MeitY, NIC, CERT-IN advisories) applicable to educational and research systems.
- **TS-3.3.7.4:** Data transmission (if enabled for updates or analytics) must use **TLS 1.3 or higher**, with **certificate pinning or device-bound authentication tokens**.
- **TS-3.3.7.5:** All firmware, SDKs, or runtime packages shall be from **officially signed, verifiable sources**, validated through checksum or digital signature verification
- **TS-3.3.7.6:** No third-party plugins or executables shall run without sandboxing or administrative approval.
- **TS-3.3.7.7:** Vendors shall supply a **Software Bill of Materials (SBOM)** listing all open-source components, licenses, and versions used in the build.
- **TS-3.3.7.8:** All firmware updates or content revisions shall be validated offline and **digitally signed** prior to deployment.

3.4Miscellaneous

3.4.1 Delivery Timeline

- The project is to be designed and executed within a period of4 months.

3.4.2 Installation

- The bidder shall be responsible for completing installation, integration, and commissioning of the proposed hardware and software components at INCOIS premises and/or other designated venues as specified by INCOIS.
- Installation shall include the setup, configuration, and verification of all equipment, devices, and supporting infrastructure such as networking, display systems, power connections, and calibration of immersive projection systems (if applicable).
- All software shall be installed, configured, and tested to ensure compatibility, optimal performance, and security compliance.

- The bidder shall perform a joint acceptance test with INCOIS officials to verify system readiness, including content loading, user interaction verification, and device synchronization (for multi-device or networked systems).
- The bidder shall provide detailed installation and configuration documentation, including version numbers, serial numbers, and system diagrams.

3.4.3 Training

- The bidder shall provide comprehensive training to INCOIS staff covering both **hardware setup and operation** and **software usage and maintenance**.
- Training shall include:
    - System startup and shutdown procedures.
    - Setup and calibration of immersive or portable devices (e.g., VR headsets, 3D projectors, holographic systems).
    - Loading and managing immersive content, including updates or patches.
    - Basic troubleshooting and first-level maintenance.
    - Safety and handling guidelines for the equipment.
    - Backup and restoration procedures for system configurations and content.
    - The bidder shall supply complete training manuals (both digital and printed), video tutorials, and quick start guides.
    - Training sessions shall be conducted **onsite at INCOIS** and optionally recorded for future reference.

3.4.4 Intellectual Property Rights (IPR)

- All software, hardware configurations, immersive environments, 3D/AR/VR content, source files, design assets, training materials, documentation, and any other deliverables developed under this project shall be the exclusive property of INCOIS.
- The bidder shall transfer full ownership rights (including source code, binaries, project files, and editable assets) of all developed content, media, and supporting applications to INCOIS upon successful completion of the project.
- Any intellectual property, algorithms, or frameworks developed specifically for INCOIS as part of this project shall not be reused, resold, or shared with third parties without explicit written consent from INCOIS.
- All the raw assets (3D models, animations, shaders, textures, sound files, scripts, UI layouts, etc.) created for the immersive applications shall be handed over in their editable, open-source, or project-native formats (e.g., Unity, Unreal, Blender, etc.).
- All software licenses (commercial or open source) used in the runtime shall be clearly declared, and any third-party licensed components shall be appropriately transferred or sublicensed to INCOIS in compliance with their respective license terms.
- INCOIS shall have perpetual, irrevocable rights to modify, reproduce, distribute, and deploy the developed environment/content in any platform (desktop, mobile, kiosk, web, VR/AR/MR systems, or future digital platforms).
- The bidder shall ensure that the developed content does not infringe upon any third-party intellectual property rights, and shall indemnify INCOIS against any claims, damages, or liabilities arising from such infringement.

4. Details of Interior Works (Lumpsum Basis)

4.1 General and Scope

4.1.1 Objective. This Scope of Work defines the design and execution responsibilities of the Vendor forthe INCOIS Experience Centre at the **INCOIS's Atal Bhavan (ITCOOcean)**, Hyderabad (approx. 30 m × 23 m hall).

Interior &MEPworks at the GPBAASRI are explicitly excluded from this contract. GPBAASRI will execute all civil, interior and MEP work through its own agencies.

All materials, fixtures, wiring and hardware must be commercial-grade and suitable for high-traffic, public use environments. This includes flooring, wall finishes, seating, brackets, cabling (minimum Cat-6 for data, high quality HDMI/Display Port cables, plenum rated where required) and connectors. The Vendor must supply all accessories and cables necessary to fully integrate each exhibit into the facility.

4.1.2 Scope.

INCOIS's Atal Bhavan (ITCOOcean)– Design + Turnkey Execution:
- Vendor shall provide end-to-end design and turnkey execution of all spatial planning, 3D visualization, interior, electrical, dynamic and programmable lighting, race ways, HVAC, networking, public-address (PA) audio system with curated audio, safety and related works for the INCOIS Experience Centre, including full integration with VR/AR, AV and physical exhibits.

4.1.3 Turnkey Responsibility at INCOIS Site. For the **INCOIS's Atal Bhavan (ITCOOcean)**Experience Centre, the Vendor is fully responsible on a turnkey design–build basis for concept design, detailed design, engineering, supply, installation, testing, commissioning and handover of all interior and MEP works, including coordination with VR/AR, AV, IT and model suppliers, and making good all disturbed surfaces and services to achieve a complete, visually coherent, code-compliant and visitor-ready Experience Centre.

4.1.4 Master Layout and Future-Ready Design. The Vendor shall develop a single master layout and interior design for INCOIS ITCOOcean Experience Centre
- Integrates all equipment / exhibits listed in the Equipment Schedule (Annexure - IV), including items supplied under this tender, items supplied under separate tenders and items planned for future phases.
- Provides clear zoning, circulation and service provisions (power, data, structural support, floor loading, lighting, HVAC) so that all planned items can be installed without major rework; and
- Treats the design as a future-ready master plan, not only for the equipment immediately supplied under this tender.

The Vendor shall study the Equipment Schedule and model drawings (e.g. Argo Float, Slocum Glider, Wave Rider Buoy, Flux Mooring, spherical display, humanoid robot, digital panels, etc.) and ensure that space planning, heights, access routes, floor loading, mounting provisions and services are suitable for safe installation, operation and maintenance.

4.1.5 Deemed Inclusion Clause. Any work, material, service, temporary provision or coordination effort reasonably necessary for complete, safe, code-compliant and aesthetically coherent functioning of the Experience Centres, but not explicitly listed, shall be deemed included in the Vendor's scope and covered by the quoted lumpsum price, with no additional claims admissible on this account.

4.1.6 Working Conditions and Coordination. All Works shall be carried out without hindering the functioning of existing buildings, with proper barricading, dust/noise control, housekeeping, safety provisions and continuous coordination with INCOIS / GPBAASRI authorities and other contractors (e.g. Equipment suppliers, IT Vendors etc).

4.1.7 Qualified Professionals. The Vendor shall engage only qualified and experienced professionals/agencies (registered architects, licensed MEP engineers, specialised interior contractors) for all design, Interiors, MEP and allied works. Credentials shall be submitted with the Technical Bid and shall be subject to INCOIS approval. INCOIS may require replacement of any professional or sub-agency found unsuitable.

4.2 Design, Drawings and Approvals

4.2.1 Design Team. The Vendor shall engage a qualified Museum Architect / Interior Designer (with verifiable museum / science centre / experience centre work) and an experienced MEP design for this assignment.

4.2.2 Concept Design – Vendor shall prepare a Concept Design for the INCOIS Experience centre covering: space planning and zoning; visitor flow and universal accessibility; interior finishes, colour and materials; lighting concept and acoustic strategy; and MEP concept coordination.
The Concept Design shall explicitly show the location, footprint and service requirements (power, data, HVAC impact, structural/mounting needs, viewing distances) of all items in the Equipment Schedule (Annexure-_IV) , indicating which items are under this tender, which are under other tenders or which are future phase items.

4.2.3 INCOIS ITCOOcean Site – Design Deliverables. For the INCOIS Experience Centre, the Vendor shall submit for approval: (a) architectural layout plans with zoning, furniture, exhibits and circulation; (b) reflected ceiling plans (proposed if any) and coordinated services

layouts(lighting, HVAC, cabling routes etc); (c) key elevations and sections of critical areas; (d) detailed MEP drawings (power, lighting, raceways, HVAC modifications (if any), networking, CCTVnd other low-voltage systems); (e) material and finish schedules; (f) A code-compliance note (NBC, relevant IS codes, fire & life safety, accessibility); and (g) 3D rendered views and a realistic walkthrough video of the visitor journey, including equipment integration plans showing footprints/clearances, power and data points, structural supports and any special acoustic/black-out requirements.

4.2.4 **GPBAASRI**:- Not Applicable for interior works. No design, concept, civil, interior or MEP design or execution is included in this section. Any equipment-level interface drawings for GPBAASRI (e.g power/data/heat-load information for the supplied systems) shall be submitted as part of the equipment scope, not interior works.

4.2.5 Approvals and Changes. Execution of physical works at INCOIS shall start only after written approval of the concept layouts, finishes and key MEP schemes by INCOIS. Design changes requested by INCOIS during the design stage shall be incorporated without additional cost, provided they are within the overall design intent and area.

4.3 Interior Execution – INCOIS ITCOOcean Site (Summary Scope)

4.3.1 Interior Works. Design, supply and installation of flooring systems (carpet, tiles, epoxy, raised platforms), ceiling systems (gypsum, acoustic, grid, bulkheads), partitions, carpentry, metalwork, cladding, ceiling modifications and doors (gypsum, glass, fire-rated doors, access control), auditorium/classroom platforms and simple stackable seating, reception, tables, swivel chairs, mounting desks, reception table and basic furniture as per approved design, including all cutting, chasing, making good and fire-stopping of penetrations. All interior elements required to transform the space must be fabricated and installed by the contractor as per approved designs.

4.3.2 Painting and Finishes. Surface preparation and application of low-VOC premium emulsion paints; provision of designer finishes (wallpapers, fabric/acoustic panels, printed graphics) for INCOIS evolution, ocean/climate themes and other storytelling content. Every wall/column in visitor areas shall be intentionally finished to support the narrative and visitor experience.

4.3.3 Lighting. Complete lighting system including track/spotlights for exhibits, dimmable downlights/linear/cove lighting for immersive zones, functional and emergency lighting, exit signs, dynamic & programmable lighting and a suitable lighting control system (scenes/dimming) coordinated with VR/AV content. Deliverables include lighting layout and circuit diagrams, fully programmed lighting sequences and post-installation verification reports.

4.3.4 Electrical. The contractor shall carry out all electrical modifications required to safely power the equipment and lighting infrastructure. This includes load assessment, circuit planning, Dedicated distribution boards, circuits and socket outlets (normal and UPS) for all zones and equipment; raceways, trunking, cable trays and conduits; earthing and bonding for panels, racks, metallic supports and sensitive AV equipment. Number and locations of DBs, circuits and sockets shall be derived from the approved master layout and Equipment Schedule.

4.3.5 HVAC. Study of existing AHUs/ducting and implementation of required modifications: rerouting/branching ducts, additional/relocated diffusers, dampers and sound attenuators, local ventilation if needed, and integration with existing controls/thermostats, including making good of affected ceilings and walls.

4.3.6 Networking and IT. Structured cabling system with fibre backbone (if required), Cat-6A (or better) data cabling, network racks, switches, Wi-Fi access points and (where included) local servers/storage and firewall, fully coordinated with all VR/AR devices, interactive tables, video walls, humanoids, spherical display, kiosks and control points, with spare capacity for future upgrades.

4.3.7 Public-Address (PA) audio system:-Immersive experience center must include a permanent public-address audio system designed for museum and public-use environments. The PA system should use professional commercial grade speakers and amplifiers with zoning and paging capability to cover all exhibition areas. It should be integrated into the interior works and AV system design.

4.3.8 Security, Safety and Signage. CCTV system (IP cameras, NVR, monitoring), integration/relocation of fire detection and alarm devices, fire extinguishers, exit signage and evacuation diagrams; comprehensive signage and wayfinding system (zone IDs, directions, operations & safety), interpretive panels, interactive labels and QR plates consistent with INCOIS branding.

4.3.9 Mounting, Platforms and Miscellaneous. All mounting hardware and structural supports for video walls, projection screens, holographic devices, interactive tables, kiosks, suspended

models, tables, furniture, desks, chairs, sofas and feature lighting; /safety barriers for heavy physical models; miscellaneous finishes, testing and commissioning of all interior-integrated systems; as-built drawings (CAD + PDF), O&M manuals, test reports and training for INCOIS staff.

4.3.10 During quarterly preventive maintenance testing and calibration of the PA system, checking of cable integrity, cleaning and re-tensioning all mounted exhibits and updating all software / firmware is to be carried out.

4.4. Coordination with Equipment and Other Packages

4.4.1 Equipment Integration – INCOIS Site. The Vendor shall coordinate interior, and MEP works with all items in the Equipment Schedule AnnexureIV, including immersive room, VR headsets, interactive table, magic book, holographic displays, physical model zones, spherical display, humanoid robots, reception/orientation, classroom, digital signage and other interactive systems. All necessary flooring/platforms, power, data, lighting, mounting and clearances shall be provided within the quoted lumpsum.

4.4.2 Separate Equipment Tenders. Where equipment is supplied under separate tenders, the Vendor shall still provide space reservations, structural supports and services based on manufacturer requirements / INCOIS inputs, designing with reasonable tolerances where make/model is not yet frozen. No extra claims will be entertained on the ground that such equipment is not supplied under this tender.

4.4.3 GPBAASRISite For the GPBAASRI site, no interior or MEP works are in scope. However, the Vendor shall provide, under the equipment scope, necessary information on power, data, mounting and heat-load requirements of the supplied systems so that GPBAASRI's own team can integrate them.

4.5. Standards, Compliance and Bill of Materials

4.5.1 Standards and Codes. All works shall comply with NBC 2016, relevant IS codes (including IS 14435, IS 1646 and IS wiring standards), applicable IEC/IBC guidelines for fire, life safety, Universal accessibility norms (e.gRPWD Act guidelines, ADIP/ADA concepts) as far as possible, and good engineering practice. Design and execution shall align with international museum/exhibition guidelines (AAM/ICOM or equivalent) to ensure museum-grade quality of space, finishes, visitor comfort, conservation, safety and durability paints, adhesives, boards, carpets and finishes shall be fire-retardant and low-VOC, with supporting test certificates.

4.5.2 Vendor Responsibility. The Vendor is responsible for complete, safe, code-compliant and aesthetically coherent completion of the INCOIS Experience Centre at ITCOOcean on a turnkey lumpsum basis. For GPBAASRI, the Vendor is limited to equipment related design, supply and documentation as defined elsewhere in the tender.

4.5.3 Bill of Materials (BoM). The Vendor shall submit a detailed BoM / line-by-line inventory for all interior and MEP works at INCOIS, indicating item description, specification, make, unit, quantity, unit rate, total cost and location/zone. This BoM shall form part of both the Technical Bid (for technical evaluation) and Financial Bid (for price break-up). Any work necessary to meet the approved design, codes or functional performance, even if not explicitly listed in the BoM, shall be deemed included in the quoted lumpsum price.

4.5.4 Equipment Schedule Reference. The Equipment Schedule (Annexure-IV) attached with the tender shall be treated as integral to this Scope. The Vendor's designs, BoM and lumpsum pricing shall fully account for space, structure and services for all listed items at INCOIS. Any interior, MEP or structural provision necessary to house, power, cool, network or safely display these items is deemed part of the Vendor's scope and price.

4.5.5 All the samples, materials, shades, schemes must be approved by INCOIS before execution.

5. List of Deliverables

5.1 Software Deliverables

Sl. No.	Software Component	Description
1	VR/AR/MR Applications	Interactive applications for all 5 INCOIS services.
2	Dual VR Versions	Standalone VR and PC-rendered VR versions.
3	Hologram & Projection Drivers	Applications for holograms, holographic table, and

		interactive walls.
4	Spatial/Autostereoscopic Display Software	Custom rendering and interaction modules.
5	XR Interaction Framework	Physics-based interaction, hand tracking, gestures.
6	Data Modules	Offline datasets, parameter inputs, modular content.
7	AI Features	Voice NLP, gesture recognition, generative AI Q&A.
8	Control/Calibration Tools	Sync tools, alignment tools, profilers.

5.2 Content Development Deliverables

Sl. No.	Content Deliverable	Description
1	Service-specific immersive content	For Tsunami, Storm Surge, PFZ, CBAS, OSF.
2	Long and short versions	3–4 min & 1–2 min.
3	High-fidelity 3D assets	2K+ textures, PBR materials.
4	Device-optimized and customized versions	Standalone VR, PC-VR, hologram, spatial 3D, wall display, book projection, interactive touch table.
5	Spatial audio & voiceover	Ambient sound, multi-language capable.
6	Multi-user VR content	Up to 3 simultaneous users.
7	Interactive elements	Quizzes, simulations, data overlays.
8	AI-enabled elements	Gestures, NLP, generative content.
9	Tablet/Control integration	Optional control panel support.

5.3 Immersive Devices Deliverables

Sl. No.	Hardware Item	Quantity	Description/Key Components
1	Type-I VR Headset (Consumer Grade)	24	4K+ VR headset with controllers, accessories, cables, flight/carrying cases.
2	Type-II VR Headset (Enterprise Grade)	6	5K VR headset with precision tracking, controllers, enterprise passthrough.
3	VR-Supporting Laptops	4	High-performance laptops (i7/RTX-5080 class GPU) for PC-VR mode.
4	3D Immersive VR Visualization System (Interactive Wall)	2	4K projector system, screens, 3D glasses, controllers, audio, and workstation.
5	Portable Spatial Reality Display	3	27" glasses-free 3D displays with stands, carrying cases and supporting laptops.
7	3-Sided Pyramid Holographic Display	2	Full HD pyramid hologram display with stand and

			carrying case.
8	4-Sided Pyramid Holographic Display	1	4K 4-sided hologram display for INCOIS Experience Centre.
9	Magic Book Projection System	1	Interactive projection book system with sensors and hidden projector.
10	Multi-Taction Interactive Table (55″) + 86″ Display	1	Touch table, wall display, smart objects, workstation.
11	Immersive Projection Room with 360^0Visual Plus Spatial Audio	1	Multiple wall and floor projection systems, Media Server, Control Systems, Mounting Accessories, Spatial Audio System for INCOIS experience center.

5.4 Interior Design & Implementation Deliverables

	Deliverable Type	Description
INCOIS Experience Centre (**INCOIS's Atal Bhavan (ITCOOcean))**	Design Deliverables	• Architectural layouts, sections and elevations for the exhibition space (approx. 30 m × 23 m). • Reflected ceiling plans showing all services. • Electrical single-line diagrams and layouts (DBs, circuits, small power, lighting). • HVAC ductwork layouts and zoning / air-balancing plans. • Lighting design, fixture schedules and control zoning. • Network and low-voltage cabling route plans (data, AV, control, CCTV, access control). • PA Audio System. •Detailed drawings for door frames, railings, platforms, ramps, risers, raceways, equipment mounts, etc. • Material specifications and schedules (finishes, fixtures, fittings). • BoQ / BoM with approximate quantities for interior and MEP works. • Design calculations (electrical load, HVAC capacity, acoustic performance, lighting levels, accessibility provisions, etc.). • 3D renders and walkthrough of the proposed visitor experience.
INCOIS Experience Centre (**INCOIS's Atal Bhavan (ITCOOcean))**	Implementation Deliverables	• Completed interior works as per approved designs and standards in Section 4. • Testing and commissioning reports for lighting, electrical, HVAC, networking, CCTV, PA Sysetm and other integrated systems. • Punch list / snag list and rectification reports. • Zone-wise inventory of installed materials and systems (matching the line-by-line BoM).
GPBAASRI – Ocean Gallery	Interior Scope	No interior design or execution is included under this contract. All civil, interior and MEP work at GPBAASRI will be executed by GPBAASRI

		through separate arrangements. The Vendor should only provide equipment-level drawings and interface information as part of the equipment scope (not this interior section).
INCOIS Experience Centre &GPBAASRI	Handover Documentation	• "As-built" drawings & schematics (CAD + PDF) for all works under the Vendor's scope at INCOIS (architectural, electrical, networking, AV, HVAC, PA Audio system, safety and signage layouts). • Equipment schedules, specifications, makes/models and warranty details for all supplied items. • Operation & Maintenance (O&M) manuals and user guides. • Test reports, commissioning certificates and compliance documentation (codes, standards, fire & life safety, accessibility). • For GPBAASRI: as-built diagrams / interface drawings only for the supplied equipment, showing power, data and mounting requirements (no interior layouts).

5.5 Interior Work Components

Sl. No.	Component Category	Description
1	Flooring	Carpet tiles, ceramic/porcelain/vitrified tiles, epoxy or resin flooring, ramps and transitions; anti-static finishes where required; all accessories for a durable, public-space finish.
2	Ceilings	Gypsum and/or modular ceilings, acoustic ceiling panels, integrated service zones, suspension systems, access panels and cable management provisions.
3	Partitions & Doors	Gypsum, metal or glass partitions; acoustic insulation; fire-rated doors and frames (where required); door hardware; access control interfaces and wiring.
4	Lighting	Track lights, spotlights, linear and cove lighting, dimmable systems, scene-based lighting controls, emergency lighting and exit signage in accordance with codes.
5	Electrical Works	Distribution boards, wiring, conduits, trunking, earthing and bonding, power outlets (normal / UPS), protection devices, and associated accessories.
6	Networking & Low-Voltage	Fiber and copper cabling, network switches, patch panels, Wi-Fi access points, AV/data/control cabling, labelling and testing.
7	HVAC	Duct modifications, diffusers and grilles, airflow tuning and balancing, noise control measures (e.g. liners, attenuators), coordination with existing systems and controls.
8	Signage & Graphics	Wayfinding signage, zone IDs, information panels, safety and regulatory signage, interpretive graphic panels and backdrops.
9	Safety & Security Systems	Fire detection/alarm interface (as applicable), fire extinguishers as per design, CCTV cameras and recording equipment, access control devices, emergency call points.
10	Mounting & Support Hardware	Wall/ceiling mounts, floor stands, brackets, anchors, raceways, equipment racks and other supports required for immersive systems and displays.
11	Finishes & Surface Treatments	Paint, textured finishes, wallpapers, claddings, trims, skirtings and protective coating suitable for high-traffic, museum-grade environments with low-VOC and fire-retardant properties.

12	Submission Deliverables	Layouts and coordination drawings, 3D renders / walkthroughs, material/sample boards, compliance and calculation documents, detailed BoM and line-by-line inventory as required under Section 4.5.3.

5.6 Documentation Deliverables

Sl. No.	Documentation	Description
1	Technical documentation	Specifications, diagrams, calibration sheets.
2	SOPs	Hardware & software operation manuals.
3	Content source files	Unity/Unreal projects, 3D assets, audio, scripts.
4	Installation reports	Acceptance test docs, wiring diagrams.
5	Maintenance logs	Preventive & corrective maintenance history.

5.7 Training Deliverables

Sl. No.	Training Area	Description
1	Hardware operation	Setup, calibration, transport, troubleshooting.
2	Software operation	Content loading, updates, monitoring.
3	Safety & handling	VR hygiene, device protection.
4	Training materials	Manuals, video tutorials, quick guides.

5.8 IPR Deliverables

Sl. No.	IPR Requirement	Description
1	Ownership transfer	All rights to INCOIS for all content & software.
2	Source assets	3D models, textures, shaders, audio, scripts.
3	Source code	Unity/Unreal project files.
4	SBOM	Software Bill of Materials.
5	Licenses transfer	Software Licenses for any required runtime software, software for immersive device control etc., Driver Licenses/Sublicensing etc.

5.9 Installation, Commissioning & Testing Deliverables

Sl. No.	Deliverable	Description
1	Hardware installation	Deployment, mounting, calibration.
2	Software setup	Configuration, optimization.
3	Performance testing	Latency, framerate, thermal tests.
4	Joint Acceptance Testing	Final verification with INCOIS.

5.10 Warranty & AMC Deliverables

Sl. No.	Deliverable	Description
1	3-Year Warranty	Full onsite support, repairs, PM.
2	2-Year AMC	Post-warranty support, updates, calibration.

3	Reporting	Quarterly AMC reports.

6. Eligibility Criteria

Only those tenderers fulfilling the following criteria shall be considered eligible for participation in this tender.
Note: Evaluation will be carried out in the following sequence: -
(a) Eligibility / Pre-qualification as per Section 6.1 (pass/fail).
(b) Technical Evaluation as per the Technical Scoring Matrix (only for eligible bidders).
(c) Financial Evaluation Ranking (only for bidder qualified in both (a & (b)).
Failure to meet any of the eligibility criteria below shall render the bid non-responsive, irrespective of the technical score obtained.

6.1. The tenderer must be a Company registered under Indian Company Act 1956 or a registered firm or a proprietorship. Registration certificate to be submitted.
Proofs for registration of the company, PAN and GST certificates are to be submitted.

6.2 Tenderer should provide profile of their company including its infrastructure, technical manpower and their expertise covering years of operation and core business areas, organisational structure and technical manpower (key roles and numbers), description of infrastructure and facilities relevant to immersive content development, integration, testing and support (e.g. VR labs, content studios, testing labs, support centres etc).

6.3 Tenderer should provide an escalation matrix with full contact details, for the resolution of reported issues during the Warranty period.

6.4 The Tenderer should have a service/operational support centre in Hyderabad and proof of the same to be submitted as rental agreement, GST registration or utility bill etc shall be submitted. In case tenderer does not have an office in Hyderabad, tenderer should submit an undertaking that an office will be established at the time of delivery of the product. Failure to do so will constitute ground for termination and /or forfeiture of Performance Security.

6.5 The tenderer should have an average annual financial turnover of **Rs. 3.55**Cr or more during the last three years ending March 31, 2025. The bidding companies should be earning profit at least during two (02) years in the last three (03) years. Audited balance sheets / profit &loss accounts with CA certified financials for the last three financial years shall be submitted.

6.6 Tenderer should have relevant experience in the functionality given in this tender document related to "**Design, development and deployment of customized 2D and 3D visual systems-based services for immersive experience (Virtual Reality/Augmented Reality/Holographic Materials)**" and should submit proofs such as purchase order, contract, work order, agreement, completion certificate, etc. of relevant work completed in the last 3 years

6.7 Tenderer should have relevant experience of at least two similar nature of work with Central or State Govt., Union Territory, PSU, CPSU, SPSU, Central universities, Autonomous Body given in this tender document**' in** the last two years (FY 2023-24 or FY 2024-25).Out of which one work of value Rs. 5.69Cr or above or two works each of value Rs. 4.26Cr or more or three works each of value Rs. 2.84Cr. Similar nature of work is defined as '**Design, development and deployment of customized 2D and 3D visual systems-based services for immersive experience (Virtual Reality/Augmented Reality/Holographic Materials).**The tenderer shall submit copies of Purchase Order / Work order and corresponding completion certificate (or client satisfactory performance certificates) for the works claimed under this criterion. Turnkey design/development experience related to science/technology museums, interpretation centres are of added value.

6.8 The bidder must also demonstrate previous work experience involving at least three different immersive devices/setups related to those specified in this tender document.

6.9 The tenderer must have atleast 20 or more employees on payroll in the roles of Solution Architect, SME, 3D Modeler, 3D Artist, Unity/Unreal Developer, 2D Artist, Project Manager, Engineer, and other relevant technical roles. EPF challan filling would be evaluated as proof of employment.

6.10 Self-certified undertaking that the firm is not blacklisted by any Government/PSU body.

6.11 Tenderer should provide Product catalogues / data sheets of all the bill of material. A consolidated Make and model statement listing OEM, model number and key specification of each major item shall be submitted.

6.12 Tenderer should provide a sheet giving details of Make and Model of the Bill of material offered.

6.12 Tenderer should provide OEM authorization letters for all the bill of material with specific reference to this tender along with Product catalogues / data sheets of the items offered. OEM Authorization letter should confirm that the bidder is an authorized partner/integrator and that OEM will extend support during warranty/AMC (spares, firmware, etc). Tenderer should submit all the relevant product catalogues / data sheets.

6.13 Earnest Money Deposit (EMD) as per section 9, Point No. 13.

6.14 Startups: In order to promote make in India and startups, the prior turnover and prior experience for all startups shall be relaxed subject to their meeting of quality, technical specifications and tender conditions as per tender. The tenderer who intends to participate as "startup" company should enclose the certificate towards startup enterprise registration/recognition issued by Department of Industrial Policy and Promotion; Ministry of Commerce and the certificate should be certified by the Chartered Accountant.

6.15 Site Visit: Given the specialized nature of the Experience Centre (integration of immersive technologies, interior works and existing infrastructure), a comprehensive understanding of site conditions is essential. Therefore,tenderer may perform a site visit to understand better.

7. Contents of the Bid

The quote should be submitted in a two – bid format. (I) Technical Bid and (II) Commercial Bid (Un-priced Bid)

7.1 Technical Bid: Technical Bid should contain all the information as listed below without which the offer will not be considered further.

- Proofs for Registration of company, PAN and GST certificates
- List of manpower and their expertise
- Escalation matrix with specific reference to this tender
- Documentary evidence to establish having service / operational support center in Hyderabad
- Turnover and Annual Profit Certificate issued by the chartered accountant
- MAF for all the bill of material
- Product catalogues / data sheets of all the bill of material
- Proof of submission / exemption of EMD
- Proof for START UP
- Complete technical documentation package consisting of
    - **Detailed solution architecture:** End-to-End system architecture, Content Development Pipeline, Proposed technologies and frameworks
    - **Software Licensing Requirements:** List of all software licenses required for deployment and runtime (including VR SDKs, 3D engines, plugins, libraries etc.), License types (Perpetual/Subscription based etc.), Transferability or sublicensing model to INCOIS, Compliance with SBOM & cybersecurity guidelines as per RFP.
    - **Hardware Integration Plan:** Proposed hardware configuration mapping to the tender list and methodology for integration
    - **Team Structure & Technical Capabilities:** List of key personnel to be assigned to the project (like Solution Architect, 3D artists, Sound Designers etc.), Roles, experience and relevant project portfolios, availability of specialized manpower for device calibration, scientific content development etc.
    - **Compliance Statements:** Compliance with all technical, content, hardware, cybersecurity, warranty & AMC requirements.
    - **Interior work documentation (Design & Implementation):** Interior implementation scope (lighting, acoustics, electrical, networking, signage, mounting, HVAC integration etc.), layouts, material specifications, installation requirements, technical dependencies to be provided as per the "**Section 4. Details of Interior Works (Lumpsum Basis)"** specifications.
    - **Project Execution Plan:** Detailed timeline for 4-month delivery. Milestones for Content design & finalization, Content development, Hardware delivery & installation, Interior design & implementation, Integration & Testing, Acceptance & Training, Risk Management & Contingency plans.

- **Previous Experience & Relevant Work Credentials:** Demonstration of past immersive experience projects executed involving the various categories of immersive experience devices listed in this tender for scientific or educational visualization. Proof of completion is to be provided through relevant copies of PO, Work orders, Client Completion certificates, Client-side contact details etc.

- Duly filled-in Technical Compliance statement given at Table-1 below
- Duly filled-in un-priced bid given at Table-2 below (Commercial Bid)
- Duly filled-in and signed bid-security declaration form
-

NOTE:
The documentary proof attached should be legible and relevant
Offers without (i) the copy of relevant POs without the work completion certificate (ii) Client Certificate without Signature, Date and Contact details of the client-side signatory (iii) duly filled-in Technical Compliance Statement (iv) duly filled-in un-priced bid, will not be considered for further evaluation.
Part/conditional/incomplete quotations will not be accepted.

Table 1: Technical Compliance Statement

<table>
<tr><th>S No</th><th>Description</th><th>Complied (Yes / No)</th><th>Legible and Relevant Documentary proof attached (Yes / No)</th></tr>
<tr><td>1</td><td>Tenderer Name, Address, Email, Contact Number</td><td></td><td></td></tr>
<tr><td rowspan="7">2</td><td>Tenderer Bank Details</td><td></td><td></td></tr>
<tr><td>Name of the Bank</td><td></td><td></td></tr>
<tr><td>Branch address</td><td></td><td></td></tr>
<tr><td>Account holder name</td><td></td><td></td></tr>
<tr><td>Account number</td><td></td><td></td></tr>
<tr><td>IFSC CODE</td><td></td><td></td></tr>
<tr><td>PFMS Account No.</td><td></td><td></td></tr>
<tr><td>3</td><td>Tenderer’s authorized Single Point of Contact for this tender</td><td></td><td></td></tr>
<tr><td>4</td><td>Proofs for Registration of company, PAN and GST certificates</td><td></td><td></td></tr>
<tr><td>5</td><td>List of manpower and their expertise</td><td></td><td></td></tr>
<tr><td>6</td><td>Single Point of Contact (SPOC):
Name:
Email:
Ph No:</td><td></td><td></td></tr>
<tr><td>7</td><td>Escalation matrix with specific reference to this tender</td><td></td><td></td></tr>
<tr><td>8</td><td>Documentary evidence to establish service / operational support center in Hyderabad</td><td></td><td></td></tr>
<tr><td>9</td><td>The Technical Bid shall include a complete technical documentation package comprising detailed solution architecture, software licensing requirements, hardware integration plan, team structure & technical capabilities, compliance statements, interior work design/implementation details, project execution plan.
NOTE: The Technical Presentation and Demo shall be conducted separately at a later stage as part of the technical evaluation process.</td><td></td><td></td></tr>
<tr><td>10</td><td>The tenderer should have an average annual financial turnover of Rs. 3.55 Cr or more during the last three years ending March 31, 2025. The bidding companies should be earning profit at least during two (02) years in the last three (03) years. Audited balance sheets / profit &loss accounts with CA certified financials for the last three financial years shall be submitted
<table>
<tr><th>Financial year</th><th>Details of Turnover</th><th>Details of Profit</th><th>Details of Net worth</th></tr>
<tr><td>2024-25</td><td></td><td></td><td></td></tr>
<tr><td>2023-24</td><td></td><td></td><td></td></tr>
<tr><td>2022-23</td><td></td><td></td><td></td></tr>
</table></td><td></td><td></td></tr>
<tr><td>11.</td><td>Tenderer should have relevant experience of at least two similar nature of work with Central or State Govt., Union Territory, PSU, CPSU, SPSU,</td><td></td><td></td></tr>
</table>

	Central universities, Autonomous Body given in this tender document' **in** the last two years (FY 2023-24 or FY 2024-25).Out of which one work of value Rs. 5.69 Cr or above or two works each of value Rs. 4.26 Cr or more or three works each of value Rs. 2.84Cr. Similar nature of work is defined as '**Design, development and deployment of customized 2D and 3D visual systems-based services for immersive experience (Virtual Reality/Augmented Reality/Holographic Materials).**The tenderer shall submit copies of Purchase Order / Work order and corresponding completion certificate (or client satisfactory performance certificates) for the works claimed under this criterion. Turnkey design/development experience related to science/technology museums, interpretation centres are of added value.		
12.	Demonstration of past immersive experience projects executed involving the various categories of immersive experience devices listed in this tender for scientific or educational visualization. Proof of completion is to be provided through relevant copies of POs, Work orders, Client Completion certificates, Client-side technical contact details etc.		
13	Client-side Technical Contact details		
14	MAF for all the bill of material		
15	A sheet giving details of Make and Model of the Bill of material offered		
16	Product catalogues / data sheets of all the bill of material		
17	Proof for submission / exemption of EMD		
18	Proof for START UP		
19	The Bidder should provide solvency certificate from their bank confirming their assets and liabilities for proving financial credibility		
20	Duly filled-in Technical Compliance statement		
21	Duly filled-in Un-Priced Bid		
22	Duly filled-in and signed bid-security declaration form		
23	Pre Contract Integrity Pact as per (Annexure 3)		
24	Compliance with the General Terms and Conditions of this tender. Signature on all the pages of the tender document, including addendum, if any, issued by INCOIS and the bidder should give a self-declaration certificate for acceptance of all terms & conditions of tender document		

7.2 Commercial Bid:

Table 2: Compliance Statement (Un-Priced bid format)
NOTE:

- **Bidder must quote for all the components given in the Price bid. Hence, please indicate as Yes or No in the table given below.**

- **Bidder should upload the price breakup (In the commercial bid cover). In the following format on bidder letter head duly signed and stamped by the authorized signatory.**
- **Price bids submitted in any other format will be summarily rejected.**
- *Any hardware, software, accessory or component not explicitly listed but necessary for the full and satisfactory installation, integration and operation of the exhibits shall be deemed included in the bidder's scope."*

Table-2: Un-Priced bid

Sl. No	Description	Unit	Qty	Please confirm whether prices are Quoted in commercial bid or not. (Yes / No) Please do not mention prices here.
1	Type-I VR Headset (Consumer Grade)	No.	24	
2	Type-II VR Headset (Enterprise Grade)	No.	6	
3	VR Supporting Laptop	No.	4	
4	3D immersive VR Visualization solution with interaction as per specifications provided, along with supporting System (Detailed breakdown of the different supporting components	No.	2	
5	Portable Spatial Reality Devices with Supporting Laptop	No.	3	
6	Portable 3-Sided Pyramid Holographic Display	No.	2	
7	4-Sided Pyramid Holographic Display	No.	1	
8	Magic Book Projection	No.	1	
9	Interactive multi-taction table with wall mounted display, mounting kit, supporting system etc.	No.	1	
10	Immersive projection room with 360^0Visual and Spatial audios. Detailed breakdown of the different components (Projectors, Lens, Audio system, Control System, Media Server etc.) to be provided.	No.	1	
11	Other low-cost immersive experience content & supporting materials like specially designed carpets/specialized designs on paper/QR codes for AR applications etc.	No.	1	
12	AR/VR Content for 5 Services (details as per the specifications provided in Section 3)	No.	1	
13	Any other Components required for complete solution. Bidders are required to list and price any additional items they deem necessary, with a line-by-line inventory. If no additional items are needed, this should be quoted as zero.	LS	1	
14	INTERIOR WORK DESIGN& TURNKEY EXECUTION Design,Concept development, engineering, supply, installation, testing and commissioning of complete interior and allied MEP works for the INCOIS Experience center at INCOIS's Atal Bhavan (ITCOOcean)(approx. 30mx23m), on a single lumpsum turnkey basis as per section 4-details of interior works and section 5 (interior	LS	1	

	deliverables) of the tender. Scope includes museum-grade space planning and zoning, interior and MEP concepts, signage/graphics guidelines and 3D visualization/walkthroughs and execution of all required flooring, ceiling partition walls and doors, auditorium/classroom platforms and seating, lighting and small power, electrical distribution, HVAC/ducting modifications, networking and IT cabling infrastructure, PA Audio system, CCTV and access control, signage and wayfinding, interpretive graphics, mounting/installation hardware, wall finishes and miscellaneous associated works, fully coordinated with all immersive/AV/IT equipment. – all as per the bidder's approved museum-grade layout and concept design. **All works shall comply with NBC 2016, relevant IS/IEC codes, accessibility norms and recognized international museum/exhibition standards, using fire-retardant, low-VOC materials suitable for public use. The Vendor shall deploy only qualified Architects, MEP engineers and specialized interior contractors as indicated in the technical bid.** **The bidder shall quote a single LUMPSUM amount for the above complete interior + MEP package and shall submit, along with the Technical/Financial bids, a detailed Bill of materials (BoM) / line-by-line inventory for these works (description, specs, make, unit, quantity, unit rate and total). Any item reasonably required to deliver a complete, safe, code-complaint, museum-grade Experience Centre shall be deemed included in this lumpsum.**			
Optional				
15	**Extended warranty/ CAMC for 4th year for the entire system**	**No.**	**1**	
16	**Extended warranty/ CAMC for 5th year for the entire system**	**No.**	**1**	
17	**Extended warranty/ CAMC for 6th year for the entire system**	**No.**	**1**	
18	**Extended warranty/ CAMC for 7th year for the entire system**	**No.**	**1**	
19	**Extended warranty / CAMC for 4th year for the entire system except GPBAASRI site items**	**No.**	**1**	
20	**Extended warranty / CAMC for 5th year for the entire system except GPBAASRI site items**	**No.**	**1**	
21	**Extended warranty / CAMC for 6th year for the entire system except GPBAASRI site items**	**No.**	**1**	
22	**Extended warranty / CAMC for 7th year for the entire system except GPBAASRI site items**	**No.**	**1**	

Nb: *Any hardware, software, accessory or component not explicitly listed but necessary for the full and satisfactory installation, integration and operation of the exhibits shall be deemed included in the bidder's scope."*

8. Quality of Service

8.1 Warranty

- The bidder shall provide a comprehensive onsite warranty for a period of three (3) years from the date of delivery, installation, and successful commissioning of the corresponding hardware and software systems.
- **Coverage Period –** The warranty period shall commence immediately after the acceptance of the supplied hardware/software at INCOIS or designated site(s).
- **Comprehensive Support –** The bidder shall undertake fault analysis, repairs, and service for all covered components (hardware, firmware updates, software upgrades, and accessories) at no additional cost to INCOIS during the warranty period.
- **Maintenance Obligations –** The bidder shall ensure proper functioning and upkeep of all systems, equipment, and associated peripherals.
    a) **Regular preventive maintenance** shall be carried out at least once every three months or as required.
    b) **Response and Resolution Time –** Resolve the reported issues within 72 hrs from the time of reporting by deploying trained manpower
    c) **Repair and Replacement –** Any faulty or non-functional hardware shall be repaired at the OEM's authorized service centre. If repair is not feasible, it shall be replaced free of cost with equivalent or superior specifications duly accepted by INCOIS within 72 hours from the time of reporting. In case, if un-resolved within stipulated time, INCOIS shall get the issues resolved through alternative means at the risk and cost of the successful bidder and that this step should not have any implications on the already agreed support for the systems / peripherals provided.
    d) Shall attend to emergency breakdown calls at short notices. There will be no restrictions on no of breakdown maintenance visits during the warranty period.
    e) **Spare Parts and Consumables –** The bidder shall ensure the availability of all necessary spares and replacement components for the warranty duration.
    f) **Warranty Documentation –** The bidder shall maintain a detailed log of complaints, actions taken, parts replaced, and resolution time, to be periodically reviewed by INCOIS.

8.2 Comprehensive Annual Maintenance Contract (CAMC)

- Upon expiry of the warranty period, the bidder shall provide Comprehensive Annual Maintenance Contract (CAMC) services for an additional two years, ensuring continued performance and reliability of the systems.
- The CAMC shall include both preventive and corrective maintenance, with the following scope:
- Regular preventive maintenance, calibration, and performance checks to maintain optimal functionality of the systems.
- Software updates, patches, and content compatibility upgrades (if applicable).
- Repair or replacement of defective parts/components/parts (consumable/non-consumable), updating the firmware, software released by OEM from time to time at no additional cost to INCOIS.
- Submission of quarterly maintenance and performance reports to INCOIS.
- Availability of technical support (remote and onsite) during official working hours, and during special events or demonstrations as notified in advance.
- The bidder shall ensure uninterrupted operation of the system and maintain a minimum uptime of 98% during both warranty and AMC periods.
- The CAMC charges (beyond the 3-year warranty) shall be quoted year-wise in the financial bid and shall remain fixed for the duration of the contract.
- Any relocation, reinstallation, or content reconfiguration required by INCOIS during the CAMC period shall be supported by the bidder under mutually agreed terms.

Penalty during SITC: In case the supply/delivery/services are delayed and if the delay is attributable to the successful tenderer OR if the offered material / service is not as per the tender specifications OR in the event of breach of any of the terms and conditions mentioned in the Purchase Order, INCOIS shall have the right.

- To recover at the rate of 0.5% per week for the value equivalent to undelivered material / services against the delay in execution of the order or part thereof subject to a maximum of 10% of the services/material not executed
- To purchase elsewhere, on the risk and cost of the defaulting supplier
- To forfeit the security deposit full or in part

Penalty during On-site warranty: The reported and unresolved problem within 72 hours will be considered as an instance. During the warranty period of two years, 8 such instances will lead to forfeiture of PBG.

9. Selection Criteria

9.1 Methodology

- **Technical Evaluation & Scoring Matrix:**Technical Evaluation Marking Criteria and information to be covered by the bidder in the **"Technical Presentation"** and **"Demonstration"** are listed below.

Sl	Description	Compliance status Yes / No	Page number against the Proof attached	Remarks/ Deviations, if any	Maximum marks
1	**Previous Work Experience & Standards (Score: 13) –** • Portfolio of similar immersive experience projects for educational/outreach with government institutions/projects in science or technology museum or centers (8) • Certifications of the organization (3) • Experience in turnkey design of immersive experience centers/museum with interior furnishing – 2 Marks				**13**
2	**Project Plan, Approach and Methodology (Score: 17)- Detailed Solution Architecture and Timelines to be covered** • Clarity of concept (1) • Detailed project Timeline and Risk mitigation(3) • Logical flow and relevance (2) • Proposal for consultation with INCOIS for understanding and incorporating scientific elements (1) • Feasible proposal for content updates/future updates (1) • Feasible proposal for tracking analytics (1) • Feasible proposals for performance improvements (2) • Any proposal for at least one regional language (2) • Use of VR development				**17**

	frameworks/standards (1) • Development approach proposed (1) • 3D content realism enhancement mechanism (2) •				
3	**Draft Storyboard Conceptualization (Score:14) Understanding demonstrated regarding the requirement (from a sample script shared in annexure-I)** • Alignment with INCOIS requirements (2) • Provision to introduce scientific principles in animations or interactions (2) • Additional features proposed (like time-lapse, scenario based impact assessment, adaptive difficulty, contextual overlays) (4) • Any introduction of innovative concepts (say interactions/additional features etc.) (3) • Introduction of any AI elements (2) • Adapting the storyboard for different immersive experience devices (1)				**14**
4	**Demo of content (Score: 30)** • VR Demo is aligned closely with requirements of the given script (Accuracy, Completeness, Innovations) (2) • Interaction & UX elements (4) • Texture quality in the demo (2) • 6 DOF virtual reality experience (3) • Use of high-quality models efficiently (2) • Sculpting, Lighting, Shadows (3) • Physically based rendering with multi-map materials (2) • Runtime render resolution display at 2064 x 2208 per eye or above as per the device capability (2) • Application sustains ≥90 FPS (or device-native refresh rate) during defined typical usage on supported modern VR headsets, with minimal frame drops and no perceptible stutter (2) • Demonstrate accurate use of scientific principles (2)				**30**

	• Screen transition smoothness Primary scene → secondary scene
	  ○ UI overlay open → close
	  ○ Camera viewpoint transition (teleport / fly / fade)
	  ○ One "heaviest" transition (largest content change) (2)
	• Audio effects: Recorded voice over (128 kbps), voice over clarity, sound effects, Emotion (2)
	• Demo includes VR headset as well as other devices (2)
	(The quantifiable elements like texture resolution, frame rate etc. need to be demonstrated in engine rather than screenshots)
	(Bidder is also required to demonstrate certain elements like screen transitions, zoom etc. to the evaluators as per the request of the evaluators)				

5	**Hardware Integration Capability (Score: 14)** **Demonstrate clear understanding of the proposed immersive experience devices and their capabilities/content specifications.** • Proposal for customization of content for different devices (2) • Clarity of proposal to procure the suggested immersive experience devices within the timelines (like OEM's available, sourcing, procurement processes etc.) (3) • Proposal for maintenance/AMC of the devices (3) • Previous work demo shown on customized devices (like interactive wall projection systems, other holographic devices etc.) (4) • Proposal for innovative and simple immersive experience devices (2)				**14**
6	**Spatial Design, Interior Layout & Museum-Grade Experience (Score: 12)** **Overall spatial concept & visitor journey (INCOIS) –** 3 **marks** Clarity of zoning Quality of visitor flow: intuitive				**12**

	direction, no dead-ends, appropriate circulation widths, provision for both shortvisit and full tour paths. **Conceptual layout & 2D plans** – 2 **marks** Appropriateness of placement of each zone and adjacency of each zone. Segregation of noisy vs quiet zones Clear entry / exit, queuing and emergency egress indicated. **Material, lighting & acoustic concept – 3 marks** Proposed interior material palette (durable, low-VOC, public-use friendly finishes). Lighting strategy per zone (accent for exhbits, ambient, darkened immersive zones, daylight control where applicable). Basic acoustic strategy for 3D immersive and VR zones (treatment, isolation from rest of hall). **Compliance with codes & museum standards** – 2 **marks** • Demonstrated understanding of NBC 2016, relevant IS codes, fire safety, accessibility, and occupancy norms. • Provision for inclusive design (ramps/level changes, tactile cues, seating for elderly, wheelchair manoeuvrability). **3D visualisation / walkthrough quality – 2 marks** Quality and realism of 3D renders / walkthroughs. • Clarity in depicting locations of major exhibits, lighting mood, and visitor experience for at least one site.				

- Only those bidders who meet all eligibility/pre-qualification criteria in section 6 of the RFP shall be considered for "Technical Evaluation".
- Technical Evaluation will be carried out by a duly constituted evaluation committee of INCOIS.
- The **"Qualified Bidders"** need to showcase a **"Technical Presentation"** and a **"Demonstration"** (created from a sample script provided in **Annexure-III**) to the evaluation committee of INCOIS on a specified date after closing of the bid.
- The **"Technical Presentation"** should outline the project plan, approach, methodology, architecture, sample content storyboard prepared based on Annexure-I (sample virtual reality descriptions for the 5 INCOIS services), past relevant experience in scientific immersive projects, experience in the different immersive devices proposed, integration capabilities with the specified hardware devices etc.
- A 30-second **"Demo"** shouldbe created by bidders for technical evaluation from a sample script provided in **Annexure-III.** It should showcase the content development capabilities & quality of the bidder. The Demonstration should include VR headsets, and optionally any other experiences (for e.g. low cost AR/WebXR) as suitable. The Bidder is required to bring/showcase on their own device(s) for the demonstration.

- The **decision of the Evaluation Committee** shall be **final and binding** on all bidders. No correspondence, appeal, or discussion will be entertained outside the formal evaluation process.
- The Committee reserves the right to:
    - **Seek clarifications** or additional information from any bidder on submitted proposals.
    - **Conduct meetings, presentations, or demonstrations** to assess the technical merit and feasibility of the proposed solution.
    - **Verify the authenticity** of any document, claim, or credential submitted by the bidder.
    - **Request additional supporting documents** or clarifications during evaluation, to which bidders must respond **promptly and fully**.
- Failure to provide requested clarifications or supporting documentation within the prescribed timeframe may result in **disqualification** of the bid.
- The evaluation committee will assign a Technical Score (T) from the "Technical Presentation" and "Demonstration" of the bidder based on the criteria and marks (total 100) specified in the "Technical Evaluation & Scoring Matrix". Marks will be considered for the complete solution.
- The bidder should get a qualifying technical score more than or equal to 75 out of 100 in the technical bid evaluation process to be qualified for commercial evaluation/opening of financial bid.
- In addition, a bidder must also score the following for qualification:
    - Sl. No. 1 – Previous Work Experience & Standards: minimum 8 out of 13 marks.
    - Sl. No. 2 - Project Plan, Approach and Methodology: minimum 13 out of 17 marks
    - Sl. No. 3 - Draft Storyboard Conceptualization: minimum 10 out of 14 marks
    - Sl. No.4 – Demo of Content – Minimum 25 out of 30 marks.
    - Sl. No.5 - Hardware Integration Capability – Minimum 11 out of 14 marks.
    - Sl. No. 6 – Spatial Design, Interior Layout & Museum-Grade Experience: minimum 8 out of 12 marks.

  Bidders failing to achieve these sub-minimum scores shall be treated as technically non-responsive, even if their overall technical score is 75or above.
- Financial bids of only those bidders who meet the eligibility criteria and achieve the above technical qualification thresholds shall be considered.
- The proposal with minimum financial bid (L1) out of the above technically qualified tenderers is selected from the GeM portal.

10. General Terms and Conditions

1. Bidders should submit online in the Government E Marketplace at http://gem.gov.in. Offers received by any other means such as hard copy, fax, e-mail etc. will not be considered.

2. Bidder's from a country which shares a land border with India are eligible to participate in this tender only, if the bidder is registered with Department for Promotion of Industry and Internal Trade (DPIIT) under Order (Public procurement No. 1) issued by Ministry of Finance, Department of Expenditure in line with OM No. F.No.6/18/2019-PPD dt 23rd July, 2020 and F.18/37/2020-PPD, dt. 08.02.2021inserting Rule 144 (xi) in GFR 2017.

3. The bidder should specifically/particularly state GST if any applicable as extra and the rate at which the same is chargeable, failing which, the prices quoted will be deemed to be inclusive of such levies. If a particular bidder is not registered under the GST Act, the prices quoted by him will be treated as net and inclusive of all taxes and statutory levies and that any future claims made by him for reimbursement of those levies on account of retrospective registration under the GST Act will under no circumstances be entertained by the INCOIS and that liability for payment of these levies will be wholly and exclusively that of the bidder quoting against our tender.

4. Bidders should fill in and submit the compliance statements along with bid. Offers received without the compliance statements will be summarily rejected. Any falsification/suppression of information could lead to disqualification. Any deviations technically or commercially should be clearly indicated in the technical bid offer only.

5. Proof for fulfillment of eligibility criteria should be submitted along with the tender. Tenders not in complete shape or not conforming to specifications or not confirming to terms and conditions are liable for rejection.

6. Offers received without EMD & Bid Securing Declaration (Bid Securing Declaration form is given in the enclosed Annexure) will be summarily rejected. In case of MSE / NSIC, a copy of valid registration certificate should be submitted along with the bid securing declaration form. The Bid Securing Declaration form must be submitted on the bidding firm's letter head duly signed and stamped by the authorized signatory.

7. Validity of Offers: Bids should have a validity period of 90 days from the tender closing date.

8. Delivery/ Compleation Period: Within four months from the date of acceptance of the purchase order.

9. Warranty Period: 3 years on-site warranty from the date of installation, commissioning & acceptance of the system.

10. Acceptance of the order by successful bidder: Within 10days from the date of issue of the PO/Order. If the acceptance communication is not received with in 10days, then PO would be deemed as accepted and binding to the successful bidder.
11. Payment terms:

    All payments shall be made against verified deliverables and certification by INCOIS.
    No advance payments shall be made. All payments are milestone based and linked to successful completion and approval of project stages.
    The quoted prices shall be all-inclusive. Taxes and duties shall be payable as per applicable law.
    A performance security shall be submitted as per Clause No.14 and shall be valid throughout the project.
    Payment for the Comprehensive AMC shall commence after completion of the 3-year warranty period.
    Percentages mentioned below are applied to the **Total Contract Value (TCV)** excluding CAMC items.

    Milestone based payments terms: -
    All payments from Milestone 1 to 5 shall be released as a percentage of theTotal Contract Value (TCV) (Excluding CAMC items).

Milestone No.	Milestone Description	Payment %
1	**Design & Content Approval**: Upon submission and INCOIS approval of: (a) master architectural and interior layouts, zoning and visitor-flow plans; (b) coordinated MEP concept drawings; and (c) content storyboards / flow diagrams for all 5 INCOIS services, as required under Sections 3, 4 and 5.	10% of TCV
2	**Delivery of Equipment and Interior Materials**: Upon physical delivery at INCOIS (and GPBAASRI, wherever applicable) of all major immersive devices, supporting systems and interior fit-out materials, as per approved BoM, and verification by INCOIS (Delivery Challans / CRAC).	30% of TCV
3	**Custom Scientific Content Development – Acceptance** Upon completion and INCOIS acceptance of all custom 2D/3D/VR/AR/holographic content for the 5 services, demonstrated on representative	25% of TCV

	devices (lab/office setup is acceptable at this stage). Acceptance shall be based on agreed storyboards, scientific correctness and functional tests.	
4	**Installation, Integration Testing & Commissioning and Provisional acceptance**: Upon completion at INCOIS of: (a) all interior and allied MEP works; (b) installation of all devices; (c) integration and configuration of approved content on each device; and (d) successful Site Acceptance Test (SAT) and issue of Provisional Acceptance Certificate by INCOIS.	15% of TCV
4	**Training & Documentation and final acceptance**: Upon (a) completion of staff training, (b) submission of full as-built drawings (CAD+PDF), O&M manuals, source/packaged content deliverables and preventive maintenance schedule, and (c) resolution of all punch-list items and issue of Final Acceptance Certificate by INCOIS.	10% of TCV
5	**Retention / Warranty Holdback**: 10% retained until completion of 3-year warranty period; may be released earlier against submission of equivalent Performance Bank Guarantee valid for the warranty duration.	From each milestone payment under M1 to M5, INCOIS shall deduct 10% of the amount payable for that milestone as retention money, subject to a maximum total retention of 10% of the Total Contract Value (TCV). Once the cumulative retention reaches 10% of TCV, no further retention shall be deducted from subsequent milestone payments. The total retention amount shall be released at the end of the 3-year warranty period or earlier against submission of an equivalent Bank Guarantee valid up to the end of the warranty period.
6	**Post Warranty CAMC – Yearly**: Payable quarterly in arrears after submission of preventive maintenance reports and service logs duly certified by INCOIS. CAMC shall start immediately after completion of the 3-year warranty period.	25% per quarter of Annual CAMC Value

No advance payment is allowed. The payment will be made within thirty (30) days of submission of tax invoice complete in all respects. All the invoices shall be supported with material delivery challans, installation reports.

Each milestone payment shall be released on achievement and certification of the respective milestone deliverables by INCOIS. Milestones may be completed and paid in any order, provided that: (a) the specific deliverables for that milestone, as described in this tender, are fully met; (b) cumulative payments, net of retention, do not exceed the value of completed milestones; and (c) the total payments at any point do not exceed the Total Contract Value (excluding CAMC)."

Net payment will be released after statutory deductions. No advance payment will be allowed, and no other payment terms will be considered.

12. Penalty Clause:

Successful bidder should make sure that the reported issues are to be dealt with immediately and should be resolved within 72hrs (3-Days) from the time of call reporting from INCOIS. If any Software / Hardware system/peripheral fails and is notreplacedwith similar/higher configuration system/peripheral of same make and duly accepted by INCOIS within72hrs from the time of reporting, it will be considered as an Instance.

If the vendor fails to meet any milestone by the agreed date, liquidated damages shall be imposed at 0.5% of the contract value per week of delay, limited to 10% of the total contract value, in accordance with GFR and standard government procurement practices.
During the warranty period of 3 years, 8 such instances will attract a penalty of 10% of Performance Guarantee (PG) value. More than three such occasions will lead to forfeitureof total PG amount. If the successful bidder fails to resolve the reported issues within72hrs, INCOIS will take up alternative measures for resolving the issues at riskandcostof the successful bidder. And this step of INCOIS should not have any implications on the already agreed support for the systems / peripherals provided.

13. Earnest Money Deposit (EMD): Rs.14,23,000/- (Rupees fourteen lakhs and twenty three thousand only) has tobesubmittedby way of Demand Draft/RTGS from any Nationalized Bank in favorof"Director, INCOIS payable at Hyderabad". The Scanned copy of the Demand Draft/RTGS/ Bank Guarantee/FDR /Insurance Surety Bond is to be uploaded to the GeM Portal while submitting the offer. Bank Guarantees/Counter Guarantees should be obtained from any of the Nationalized/schedule bank of India with a validity of 6 months from the closing of the bid due date and should be sent by the issuing banker directly to the office of INCOIS, Hyderabad. *The original DDs/ Financial Instruments, if any should reach to INCOIS on or before 14:00 Hrs.of bid submission date.i.e 30.01.2026 (RTGS details: Name of the Bank: SBI, HAL campus Branch; Account Name: Director, INCOIS; A/c No. 10442322840; IFSC Code: SBIN0001676).* Indian Vendors registered with Ministry of Micro Small Enterprises (MSE) /National Small Scale Industries Corporation (NSIC) are exempted from payment of EMD only if the Indian vendor is manufacturing and supplying the tendered products for this tender.

14. Performance Deposit: Successful bidder must submit 05% of the order value towards Performance Deposit by means of Demand Draft drawn in favor of Director, INCOIS payable at Hyderabad or Bank Guarantee from any Nationalized Bank valid for up to 60 days beyond the completion of contract as per scope of work. This deposit will be free of interest and is refundable after the satisfactory execution of the contract and complete fulfillment of contractual obligations.

15. Performance Deposit/ Security Deposit is liable to forfeiture in the event of non-execution order during validity period of the contract OR If the service of the successful bidder is found to be unsatisfactory and fails to adhere to our tender terms and conditions OR Any unilateral revision/decision made by the successful bidder during the validity period of the contract.

16. If any loss or damage is caused to INCOIS property by workmen deployed by the successful bidder, the cost of the same will be recovered from the agency/contractor.
17. The Contractor shall ensure the safety and security of all workforces employed for this work and equipment provided by him under the Contractor until all the works entrusted are completed in all respects and taken over by INCOIS. In the event of damages except under force majeure clause i.e., fire, wind, rain, floods or through any hazards, pilferage, other natural calamities etc., the Contractor shall make good the damaged works and restore the same to the original condition at his own cost.
18. Liquidated Damages Clause: In case the supply/delivery/services is delayed and delay is attributed to the Successful Bidder or is not as per our specifications and in the event of breach of any of the terms and conditions mentioned in the Purchase Order, INCOIS shall have the right.

    a) To recover at the rate of 0.5% per week for the value equivalent to undelivered material / services against the delay in execution of the order or part thereof subject to a maximum of 10% of the services/material not executed/delivered.
    b) To purchase elsewhere, after due notice to Tenderer Inc., on the account and at the risk of the defaulting supplier for the stores/services not supplied or others of a similar description without cancelling the work order in respect of the job not yet due for supply or

c) To cancel the order or a portion thereof and if so desired to purchase the stores / services at the risk and cost of the defaulting supplier and also.
d) To extend the period of delivery with or without penalty shall not be more than agreed liquidated damages referred to in clause (a) above,
e) To forfeit the security deposit full or in part at the discretion of Director, INCOIS.

19. Force Majeure Clause:
If the execution of the contract / supply order is delayed beyond the period stipulated in the contract as a result on out-break of hostilities, declaration of an embargo's or blockage or fire flood, acts of nature or any other contingency , pandemic declared by WHO/Govt. authorities causing stoppage of work beyond the supplier's /INCOIS control, Director, INCOIS may allow such additional time by extending the delivery period as he considers to be justified by the circumstances of the case and his decision shall be final, conclusive and binding. If and when additional time is granted by the INCOIS, the contract/supply shall be read and understood as if it had contained from its inception the delivery date as extended.

20. If any tenderer withdraws his tender after price bid is opened, with in the validity period or makes any modifications in the terms and conditions of tender, which are not acceptable to the INCOIS, then INCOIS shall without prejudice to any other right or remedy available to it, be at liberty to initiate appropriate action w.r.t bid for forfeit of EMD & bid securing declaration in case of MSEs.

21. Defect Liability Period if any: Same as Warranty Period.

22. The Bids shall be uploaded only after being signed by a duly authorized officer of the firm (Single point of contact) which is bidding for the tendered requirement.

23. The acceptance of the tender will solely rest with the Director, INCOIS who does not bind himself to accept the lowest or any other tender. No reasons will be furnished for acceptance or rejection of any tender.

24. If any loss or damage is caused by workmen deployed by the successful bidder. The cost of the same will be recovered from the successful bidder.

25. Director, INCOIS reserves the right to alter the scope/or reduce quantum of work, before/after issue of work order OR terminate the contract either whole or part of the contract with one month notice and tenderer shall not have any claim whatsoever on this account.

26. In case of any unresolved dispute or differences arising at any time between this Institute and the firm holding the contract, these shall be resolved in terms of the Arbitration and Conciliation Act 1996 and held at Hyderabad, Telangana, India only. Further, this contract is subject to laws of India alone.

27. **Pre-Bid conference:** Participation in the Pre-Bid meeting is mandatory for all the bidders and is a Pivotal step in the Tender process. Schedule at 11:00 am on January 23, 2026 at INCOIS, Hyderabad. To facilitate a structured and efficient discussion, bidders shall submit their queries in writing to manyam@incois.gov.in. No later than January 19, 2026 at 10 am. For, Any Technical queries/ Clarification , contact below before 11:00 am January 20,2026

28. Clarifications: For clarifications related to tender, please contact
Shri V Subrahmanyam, Purchase Officer, INCOIS
email: manyam@incois.gov.in
Tel: 040-23886022

Declaration: I, _____ son/daughter of _____ aged _____years and residing at _____ _____ _____State and sole proprietor /managing partner /director of _____, after having read and understood the tender document No……. dated……. floated by the Institute, hereby undertake that I agree to and shall abide by the terms and conditions prescribed in the said tender document for"**Turnkey Design, Development, Supply, Installation, Testing,**

Commissioning and Integration of Immersive Experience Centre at INCOISandGPBAASRI - Comprehensive Package Including VR/AR/Holographic Solutions, Custom Scientific Content Development, Museum-Grade Interior, MEP Works, Technical Infrastructure and 3-Year Warranty & 2-year AMC".

Signature of the Tenderer/Authorized Signatory & date

Name OFFICE SEAL, Address

Note: The bidder/tenderer has to sign & stamp on all pages of tender document and upload the same

ANNEXURE-1

Basic proposal/storyboard

As a starting point, we envisage up to five basic environments in our VR/AR system to effectively communicate/educate the users about our services.

- **Beach**
- **Shallow Ocean**
- **Deep Ocean**
- **On Water (Ship/Boat)**
- **Lab environment (INCOIS)**

Each of our services may cover one or more of the above environments. For example, Tsunami/Storm Surge VR scenes may cover Beach/Deep Ocean/INCOIS Lab environment (extendable to other environments also). PFZ VR scenes could cover On Water/INCOIS Lab environment etc.

A sample environment description and interaction proposals are detailed below for each of the envisaged INCOIS services.

Customized content storyboards need to be developed for different devices based on an understanding of this sample and detailed INCOIS services document.

Sample description of services for VR/other content
Tsunami Early Warning

1. Environment Design

a. Deep Ocean Environment:

- **Visual Elements**:
  - Vast, dark blue ocean with varying depths to provide a sense of scale.
  - Submarine landscapes, underwater ridges, and trenches.
  - Buoys, seismic sensors, and underwater cables for realism.
  - Animations of tectonic plate movements and fault lines triggering a tsunami.
- **Dynamic Effects**:
  - Ripple effects from seismic activity leading to wave generation.
  - Underwater currents and rising waves depicted in slow motion.
  - Marine life reactions (e.g., fish scattering, corals swaying).
- **Sound Design**:
  - Low-frequency rumbles for underwater seismic events.
  - Subtle ambient ocean sounds (waves, underwater hums).

b. Beach Environment:

- **Visual Elements**:
  - A serene coastline with a sandy beach, coastal vegetation, and nearby settlements.
  - Calm waves transition into high-energy tsunami waves as the event progresses.
  - Realistic buildings and infrastructure along the coast.
- **Dynamic Effects**:
  - Water receding from the shoreline as the tsunami approaches (classic precursor sign).
  - Towering tsunami waves crashing onto the beach and flooding the area.
  - Realistic debris flow and structural destruction.

- **Sound Design**:
    - Peaceful beach sounds transitioning into alarms or warning sirens.
    - Roaring waves and crashing sounds during the tsunami's impact.

c. Forecasting Lab Environment:

- **Visual Elements**:
    - A state-of-the-art operational forecasting room with large monitors and real-time data feeds.
    - Interactive dashboards showing seismic activity, wave propagation models, and alert zones.
    - Scientists interacting with models, communication devices, and alert systems.
- **Dynamic Effects**:
    - Real-time updates on tsunami propagation maps.
    - Models depicting energy transfer across the ocean.
    - Alerts being generated and communicated to coastal regions.
- **Sound Design**:
    - Background chatter of scientists and beeping of monitoring systems.
    - Announcement of alerts in a professional tone.

2. Interaction with the Environment

a. Deep Ocean Interaction:

- **User Actions**:
    - Inspect underwater seismic sensors and buoys.
    - Observe and manipulate tectonic plates or fault lines to simulate a tsunami.
    - Trigger an earthquake and watch the wave propagation process from the ocean floor to the surface.
- **Educational Features**:
    - Pop-up information on tsunami causes, seismic sensors, and underwater topography.
    - Real-time data visualization of energy release and wave formation.

b. Beach Interaction:

- **User Actions**:
    - Move around the beach and observe the early signs of a tsunami (e.g., water receding).
    - Interact with warning systems like tsunami sirens or evacuation boards.
    - Help simulate evacuation scenarios or assess the impact of waves from different vantage points.
- **Educational Features**:
    - Highlighted areas showing the impact of wave height and inundation levels.
    - Pop-ups explaining what to do in a tsunami emergency.

c. Forecasting Lab Interaction:

- **User Actions**:
    - Analyze seismic and oceanographic data on virtual screens.
    - Run tsunami forecasting simulations by entering earthquake parameters.
    - Issue alerts to coastal areas based on forecasting results.
    - Participate in decision-making scenarios like coordinating evacuation plans.
- **Educational Features**:
    - Interactive tutorials on how tsunami forecasting systems work.
    - Virtual demonstrations of the warning generation process.

3. Additional Features

- **Multiplayer/Collaborative Mode**:
    - Users can collaborate as scientists, emergency responders, or observers.
    - Team-based activities like issuing warnings and planning evacuations.
- **Time-Lapse Feature**:
    - Allow users to fast-forward and rewind the tsunami event to observe its entire lifecycle, from deep ocean formation to coastal impact.
- **Real-Life Case Studies**:

    - Simulate historical tsunami events (e.g., 2004 Indian Ocean Tsunami) to educate users about their progression and aftermath.
- **Impact Assessment Mode**:
    - Let users explore the post-tsunami scenario, including damage assessment and recovery efforts.

Storm Surge Warnings

1. Environment Design

a. Open Ocean Environment:

- **Visual Elements**:
    - Vast ocean with dynamic wave patterns and varying weather conditions.
    - Satellite buoys and oceanographic instruments floating in the water.
    - Large-scale weather systems, such as cyclones, forming over the ocean.
    - Wind patterns and cloud rotations associated with storm systems.
- **Dynamic Effects**:
    - Cyclone intensification, visible as increasing wave heights and spiraling cloud systems.
    - Real-time data feed from buoys, showing wave heights, wind speeds, and pressure drops.
    - Visualization of storm surges propagating from the cyclone center towards the coast.
- **Sound Design**:
    - Low, ominous hums of strong winds and distant thunder.
    - Intensifying ocean sounds as the storm surge builds.

b. Beach Environment:

- **Visual Elements**:
    - A tranquil coastal area with sandy beaches, mangroves, nearby villages, and infrastructure.
    - Transition to heavy rain, rising sea levels, and flooding as the storm surge approaches.
    - Visualization of inundation zones and the gradual overtopping of seawalls or natural barriers.
- **Dynamic Effects**:
    - Water levels rising in sync with the storm surge model, flooding low-lying areas.
    - Wind-driven waves crashing onto the shore, with visible erosion and debris flow.
    - Coastal structures (houses, boats) being impacted by the surge.
- **Sound Design**:
    - Initial calm beach ambiance (waves, birds) transitioning to storm sounds (wind, rain, and crashing waves).
    - Warning sirens and evacuation announcements in local languages.

c. INCOIS Lab Environment:

- **Visual Elements**:
    - A high-tech forecasting center with screens displaying cyclone tracking, storm surge predictions, and inundation maps.
    - Real-time visualization of satellite data, buoy readings, and storm trajectory.
    - Interactive dashboards showing surge height forecasts, warning zones, and evacuation plans.
- **Dynamic Effects**:
    - Live updates on storm surge predictions based on user-entered data or ongoing scenarios.
    - Alerts being generated and disseminated to stakeholders.
    - Animation of storm surges propagating from open ocean to coastal zones.
- **Sound Design**:
    - Subtle background noise of computers and communication systems.
    - Alarms or notification tones for warnings.

2. Interaction with the Environment

a. Open Ocean Interaction:

- **User Actions**:

    - Explore buoys and sensors that monitor ocean parameters (e.g., wave heights, wind speeds, pressure).
    - Observe a cyclone forming and intensifying in real time.
    - Trigger storm surge models to visualize how a cyclone's intensity affects surge height and spread.
    - Interact with data overlays showing live satellite observations and weather charts.
- **Educational Features**:
    - Pop-ups explaining storm surge formation, influenced by wind, pressure, and bathymetry.
    - Real-time tracking of storm energy transfer to ocean waves.

b. Beach Interaction:

- **User Actions**:
    - Walk along the shoreline and observe the storm surge's impact on different coastal zones (villages, mangroves, seawalls).
    - Interact with evacuation points, warning signboards, and shelters.
    - Assess how natural and man-made defenses (e.g., mangroves vs. seawalls) reduce surge impacts.
    - Participate in emergency response scenarios, such as guiding virtual civilians to safety.
- **Educational Features**:
    - Highlight flood-prone zones and areas requiring improved defenses.
    - Tutorials on community preparedness for storm surges (e.g., evacuation drills, identifying safe zones).

c. INCOIS Lab Interaction:

- **User Actions**:
    - Analyze real-time data from the open ocean (buoys, satellites, and weather models) to predict storm surge height and impact zones.
    - Run simulations for different cyclone scenarios and observe how storm surges propagate.
    - Issue warnings to coastal regions using interactive alert systems.
    - Monitor the effectiveness of existing defenses and evacuation plans using virtual tools.
- **Educational Features**:
    - Step-by-step guidance on how storm surge forecasts are generated.
    - Case studies of past storm surges (e.g., Cyclone Amphan, Cyclone Tauktae) to demonstrate the importance of early warnings.

3. Additional Features

a. Scenario Customization:

- Allow users to customize cyclone intensity, storm paths, and coastal conditions to observe varying impacts.
- Add historical scenarios, like the 1999 Odisha Super Cyclone or Cyclone Phailin, to highlight real-world events.

b. Interactive Training Mode:

- Guide users through forecasting processes, from cyclone detection to storm surge prediction and issuing alerts.
- Include decision-making scenarios where users determine evacuation timing and resource allocation.

c. Time-Lapse Visualization:

- Observe the entire storm surge event in fast forward, from cyclone formation to post-surge flooding.

d. Post-Surge Assessment Mode:

- Explore the aftermath of a storm surge, including damage assessment, recovery efforts, and lessons learned.

e. Collaboration Mode:

- Include a multiplayer feature for users to collaboratively manage storm surge warnings as forecasters, emergency responders, or local administrators.

Potential Fishing Zones

1. Environment Design

a. Fishing Boat Environment:

- **Visual Elements**:
  - A fishing boat floating in the ocean equipped with basic fishing gear and modern tools like GPS and echo sounders.
  - The horizon with distant clouds, waves, and visible markers for PFZs.
  - A radar display or mobile device onboard, showcasing real-time PFZ maps.
  - Marine life below the boat, including schools of fish in the identified PFZ.
- **Dynamic Effects**:
  - Transition from calm seas to active PFZ areas, marked by increased fish activity.
  - Animated fish schooling behavior around nutrient-rich zones.
  - Interaction with weather conditions like wind, rain, or ocean swells affecting the boat's stability.
- **Sound Design**:
  - Gentle water sloshing and the hum of the boat engine.
  - Splashing sounds from fish movements and occasional bird calls.
  - Alerts or voice guidance indicating the proximity to PFZs.

b. Ocean Surface Environment:

- **Visual Elements**:
  - A wide expanse of ocean with dynamic waves and subtle color changes representing temperature or chlorophyll gradients.
  - Buoys and oceanographic instruments collecting data for PFZ identification.
  - Visual overlays for critical PFZ parameters, such as SST, ocean currents, and chlorophyll concentration.
  - Migration patterns of fish visible in hotspots.
- **Dynamic Effects**:
  - Real-time visualization of oceanographic data transforming into PFZ indicators.
  - Movements of marine life responding to favorable conditions like temperature and food availability.
  - Upwelling areas with visible nutrient plumes creating fish-rich zones.
- **Sound Design**:
  - Ocean waves with occasional distant thunder or rain to depict varying weather.
  - Subtle sonar pings and buoy signals for a scientific feel.
  - Natural sounds like dolphin clicks or bird calls near PFZs.

c. INCOIS Lab Environment:

- **Visual Elements**:
  - A high-tech control room with large interactive screens displaying satellite imagery, SST maps, and PFZ forecasts.
  - Real-time data feeds from ocean observation systems (satellites, buoys, and ARGO floats).
  - Analytical dashboards showing PFZ predictions and validation reports.
  - Interactive features like PFZ alert systems and communication tools for disseminating information to fishing communities.
- **Dynamic Effects**:
  - Updates on PFZ locations as data changes in real time.
  - Simulated forecasting workflows: data collection, model processing, and final predictions.
  - Live communication with a virtual fishing fleet to guide them to PFZs.
- **Sound Design**:
  - Background noises of keyboards, system beeps, and occasional announcements.
  - Informative voiceovers explaining the PFZ prediction process.
  - Alert sounds for new PFZ forecasts being generated.

2. Interaction with the Environment

a. Fishing Boat Interaction:

- **User Actions**:
  - Navigate the boat using GPS to reach PFZs.

    - Drop fishing gear and observe marine life responses in real time.
    - Interact with onboard devices (e.g., radar, echo sounders) to locate fish accurately.
    - Follow PFZ guidance systems to optimize fishing efforts.
- **Educational Features**:
    - Tutorials on using PFZ data for sustainable fishing.
    - Pop-ups explaining fish behavior in nutrient-rich zones and how PFZs are identified.

b. Ocean Surface Interaction:

- **User Actions**:
    - Explore the ocean surface to identify PFZ markers using overlays.
    - Interact with buoys or virtual drones to understand data collection techniques.
    - Observe marine life in different oceanic conditions (upwelling zones, thermal fronts).
- **Educational Features**:
    - Visual explanations of SST gradients, chlorophyll distribution, and their link to PFZ formation.
    - Real-time feedback on how ocean dynamics influence fish aggregation.

c. INCOIS Lab Interaction:

- **User Actions**:
    - Analyze data from satellites and buoys to predict PFZs using interactive tools.
    - Generate alerts and communicate them to virtual fishing boats in different regions.
    - Validate PFZ predictions by comparing forecasted and observed data.
    - Customize PFZ simulations by adjusting oceanographic parameters (e.g., temperature, currents).
- **Educational Features**:
    - Guided tours of how PFZ forecasts are generated and disseminated.
    - Case studies of successful PFZ predictions and their impact on fisheries.

3. Additional Features

a. Scenario Customization:

- Simulate different environmental conditions (e.g., monsoon vs. dry season) to observe PFZ variations.
- Include case studies of PFZ utilization in different regions (e.g., Indian Ocean, Arabian Sea).

b. Sustainability Focus:

- Highlight the importance of sustainable fishing practices and the impact of overfishing on PFZs.
- Educate users on the ecological balance required to maintain PFZ health.

c. Time-Lapse Feature:

- Visualize the evolution of PFZs over time as influenced by seasonal changes and oceanographic dynamics.

d. Collaboration Mode:

- Multiplayer features allow users to collaborate as fishers, scientists, and policymakers to optimize PFZ usage.

Ocean State Forecast

1. Environment Design

a. Ocean Surface Environment

- **Visual Elements**:
    - A vast ocean expanse with dynamic waves, tides, and currents.
    - Simulated features such as cyclonic eddies, ocean swells, and wave height gradients.
    - Virtual markers for significant ocean state parameters like wave height, wind speed, and ocean currents.
    - Ships navigating through varying ocean conditions to demonstrate the utility of OSF in maritime activities.
- **Dynamic Effects**:
    - Changing weather conditions (e.g., calm seas transitioning to stormy waves).
    - Real-time visual overlays of OSF data, such as arrows for ocean currents, color-coded wave heights, and wind speeds.
    - Representation of hazards like rough seas, cyclones, or abnormal waves.

- **Sound Design**:
    - Background sounds of ocean waves, wind, and occasional thunderstorms.
    - Subtle sonar pings and ship engines for realism.
    - Alerts or voiceovers warning of hazardous conditions.

b. INCOIS Lab Environment

- **Visual Elements**:
    - A high-tech forecasting center with interactive screens displaying real-time oceanographic data (wave height, currents, SST, wind patterns).
    - Visualization of OSF models such as wave predictions, wind forecasts, and current fields.
    - Satellite data streams and outputs from numerical models are integrated into dynamic dashboards.
    - Communication systems for disseminating forecasts to stakeholders (e.g., port authorities, fishers, and naval operations).
- **Dynamic Effects**:
    - Interactive workflows demonstrating how OSF data is generated, from data assimilation to model predictions.
    - Live updates on critical ocean state warnings, such as high waves or cyclones.
    - Simulated real-time decision-making for maritime safety, shipping routes, and coastal management.
- **Sound Design**:
    - Subtle sounds of keyboards, announcements, and system beeps.
    - Informative voiceovers explaining OSF generation processes and its real-world applications.
    - Alarm sounds for hazardous ocean states.

c. Onboard a Ship Environment

- **Visual Elements**:
    - A virtual ship deck with navigational tools like radar, GPS, and OSF-integrated displays.
    - Realistic representation of the ocean viewed from the ship, including dynamic waves, currents, and storm clouds.
    - A map overlay showing OSF data guiding the ship's navigation.
- **Dynamic Effects**:
    - Real-time ship movement responding to simulated ocean conditions (e.g., high waves, strong currents).
    - Alerts indicating hazardous weather and how OSF helps optimize routes for safety and efficiency.
    - Interactive tools to adjust ship speed and direction based on OSF predictions.
- **Sound Design**:
    - Sounds of the ship engine, creaking of the deck, and ocean waves hitting the hull.
    - Warning sounds for approaching storms or high-wave zones.
    - Communication chatter with virtual coastal stations or INCOIS lab for OSF updates.

2. Interaction with the Environment

a. Ocean Surface Interaction:

- **User Actions**:
    - Explore ocean surface conditions using virtual tools that visualize OSF data (e.g., wave heights, current speed, wind patterns).
    - Identify areas of high-risk ocean states, such as cyclones or high swells.
    - Simulate the effects of OSF-guided decisions (e.g., redirecting a vessel or issuing coastal alerts).
- **Educational Features**:
    - Interactive tutorials on interpreting OSF data (e.g., how wave height and wind forecasts are represented).
    - Visual explanations of ocean state dynamics, such as wave-current interactions.

b. INCOIS Lab Interaction:

- **User Actions**:

    - Analyze ocean state data from satellites, buoys, and ARGO floats in real time.
    - Generate OSF products like wave predictions, wind forecasts, and cyclone warnings.
    - Disseminate forecasts to virtual stakeholders, including ports, fishers, and coastal communities.
    - Conduct sensitivity tests by adjusting oceanographic parameters (e.g., wind speed, SST).
- **Educational Features**:
    - Guided workflows showing the OSF model pipeline: data assimilation, model prediction, and forecast dissemination.
    - Case studies of OSF's role in preventing maritime accidents or aiding search and rescue missions.

c. Onboard a Ship Interaction:

- **User Actions**:
    - Use OSF-guided navigation tools to steer the ship through simulated ocean conditions.
    - Adjust ship routes in response to forecasted hazards like cyclones or high waves.
    - Monitor OSF displays to planfuel-efficient and safe shipping routes.
- **Educational Features**:
    - Tutorials on how OSF assists mariners in real-time decision-making.
    - Demonstrations of how OSF predictions reduce risks in shipping, fishing, and naval operations.

3. Additional Features

a. Scenario Customization:

- Simulate different weather conditions (e.g., cyclones, monsoon swells, or calm seas) to explore OSF's applicability.
- Include case studies of OSF use in specific regions (e.g., Bay of Bengal or Arabian Sea).

b. Time-Lapse Feature:

- Observe how ocean states evolve over time using OSF data, such as the progression of a storm or eddy.

c. Multiplayer Collaboration:

- Enable users to work as a team, simulating real-world scenarios like coordinating coastal evacuations or rerouting vessels.

d. User Roles:

- Assume different roles, such as a forecaster at INCOIS, a ship captain, or a coastal manager, to understand OSF's applications from various perspectives.

Coral Bleaching and Marine Heat Waves

1. Environment Design

a. Shallow Ocean (Coral Reef Ecosystem)

- **Visual Elements**:
    - Vibrant, colorful coral reefs with diverse marine life such as fish, turtles, and crustaceans.
    - Dynamic representation of coral health transitioning from healthy (vivid colors) to bleached (white and pale corals) due to rising ocean temperatures.
    - Marine heatwave indicators, such as water temperature overlays (color-coded gradients).
    - Sediment clouds and algal blooms affect the ecosystem due to heatwave-related stress.
- **Dynamic Effects**:
    - Real-time changes in coral appearance based on rising ocean temperatures, showing the bleaching process.
    - Reduced fish activity and dying marine organisms as the ecosystem deteriorates.
    - Simulation of seasonal or extreme heatwave events (e.g., thermal stress maps over time).
- **Sound Design**:
    - Natural underwater sounds: gentle water currents, fish movements, and occasional whale songs.
    - Subtle alarms or warning signals as ocean temperatures cross critical thresholds.

- Voiceovers explaining the impacts of marine heatwaves on coral reefs.

b. INCOIS Lab Environment

- **Visual Elements**:
  - A high-tech forecasting room with interactive screens displaying ocean heatwave data (sea surface temperature anomalies, thermal stress maps, and historical heatwave events).
  - Real-time satellite imagery and outputs from numerical models predicting heatwaves and coral bleaching hotspots.
  - Dashboards showing coral reef health indices, thermal stress thresholds, and climate change projections.
- **Dynamic Effects**:
  - Simulated workflows: data collection, model simulations, and dissemination of early warnings for coral bleaching.
  - Heatwave progression maps with predicted coral bleaching events in key regions (e.g., Andaman & Nicobar Islands, Lakshadweep).
  - Communication systems for alerting stakeholders (e.g., marine park authorities, researchers, and conservationists).
- **Sound Design**:
  - Background sounds of computer systems, subtle keyboard typing, and beeps.
  - Voiceovers explaining the scientific processes behind forecasting marine heatwaves.
  - Alert sounds when SST anomalies cross critical thresholds for bleaching.

2. Interaction with the Environment

a. Shallow Ocean Interaction

- **User Actions**:
  - Explore a coral reef ecosystem and observe changes in coral health due to rising water temperatures.
  - Interact with virtual tools to measure parameters like SST, pH levels, and oxygen content in real time.
  - Identify stress zones in the reef using overlays of thermal stress or chlorophyll concentration.
  - Observe the ecosystem's recovery under reduced heat stress conditions (with simulated interventions like shading or cooling experiments).
- **Educational Features**:
  - Pop-ups explaining how marine heatwaves cause bleaching, disrupt ecosystems, and lead to biodiversity loss.
  - Visuals show the role of healthy reefs in supporting marine biodiversity and protecting coastlines.

b. INCOIS Lab Interaction

- **User Actions**:
  - Analyze real-time SST and heatwave forecasts using interactive maps and data overlays.
  - Simulate coral bleaching forecasts by inputting data from buoys, satellites, and historical trends.
  - Disseminate alerts to virtual stakeholders, including conservation teams and policymakers.
  - Conduct experiments on model outputs, adjusting parameters (e.g., reducing greenhouse gas emissions) to observe impacts on coral health.
- **Educational Features**:
  - Tutorials explaining how marine heatwave predictions are generated and validated.
  - Case studies of historical coral bleaching events and their socio-economic impacts.

3. Key Features and Learning Objectives

a. Scenario Customization

- Simulate different levels of heat stress, from mild to severe marine heatwaves, and their corresponding impacts on coral reefs.
- Include case studies of regions vulnerable to bleaching, like the Indian Ocean, Great Barrier Reef, and Lakshadweep.

b. Recovery and Mitigation Efforts

- Showcase coral restoration techniques, such as artificial reefs, selective breeding of heat-resistant corals, and localized cooling systems.
- Educate users on the role of global climate action in reducing heatwave intensity and frequency.

c. Time-Lapse Feature

- Allow users to observe the bleaching process over weeks or months in a time-lapse view, highlighting how prolonged heat stress impacts coral reefs.
- Visualize reef recovery when stressors are mitigated (e.g., reduced warming).

d. Multiplayer Collaboration

- Enable users to take on roles such as researchers, policymakers, and conservationists, working together to predict, mitigate, and manage coral bleaching impacts.

e. User Roles

- **Marine Scientist**: Analyze thermal stress, conduct experiments, and predict bleaching events.
- **Conservationist**: Implement strategies to protect and restore reefs using VR tools.
- **Policy Maker**: Use data to understand the importance of reducing emissions and funding coral protection projects.

4. Educational Impact

This VR experience will provide:

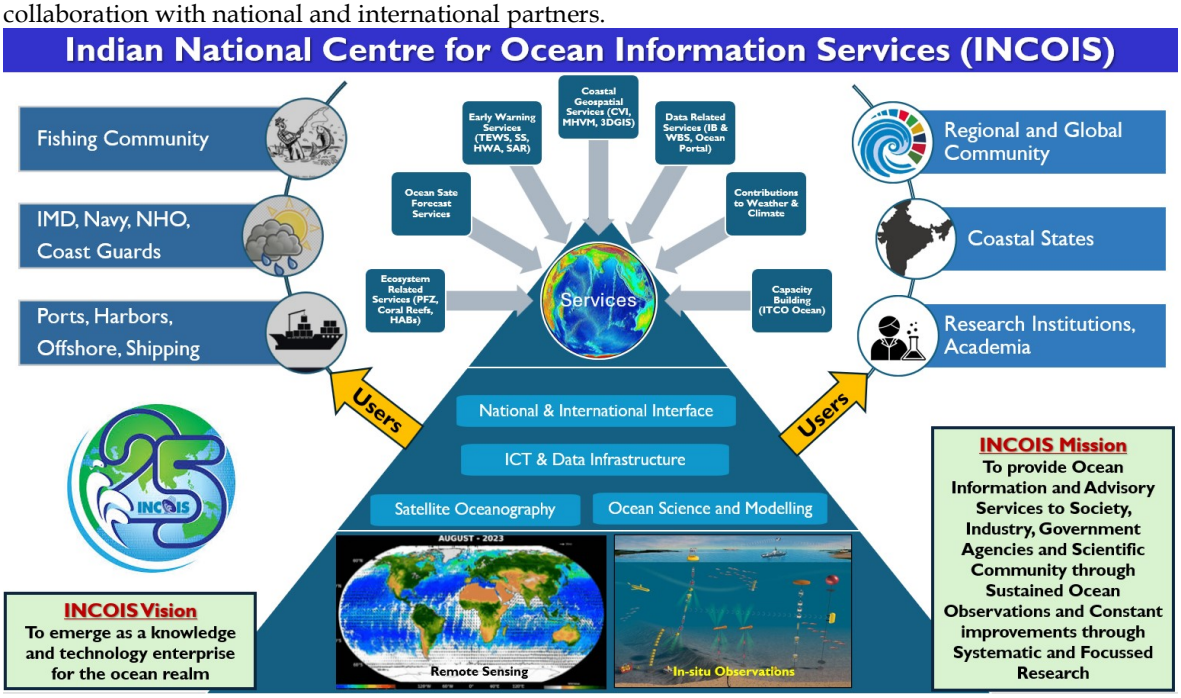
- A deeper understanding of how marine heatwaves and coral bleaching occur.
- Insights into the ecological and economic importance of coral reefs.
- Awareness of the need for conservation efforts and climate action to protect marine ecosystems.

ANNEXURE-2

Indian National Centre for Ocean Information Services (INCOIS)

INCOIS Activities

Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India has been mandated "to provide the best possible ocean information and advisory services to society, industry, government agencies and the scientific community through sustained ocean observations and constant improvements through systematic and focused research". Since its inception, this vibrant organization has been engaged in Ocean Observations, Modelling, Information and Advisory Services. The services provided by INCOIS, such as the Tsunami and Storm Surge Early Warnings, Ocean State Forecasts (OSF), Potential Fishing Zone (PFZ) advisories and Ocean Data Services proved to have immense socio-economic benefits for a wide range of stakeholders and enhance the lives and livelihoods of coastal communities. And the services are being provided to various stake holders namely, fisher folk, the coastal population, government agencies involved in coastal zone management and disaster management, the shipping industry, the oil and natural gas industry, the Indian Navy, the Coast Guard, researchers, academia, and students. All these activities are underpinned by a strong bedrock of science enabled by excellent Ocean Observing Networks, Data & ICT infrastructure, Ocean Modelling, Data Assimilation, Satellite Oceanography and Capacity Development programmes that have been diligently built by INCOIS over the years in collaboration with national and international partners.



As part of ensuring the safety of sea going community and population residing in the coastal villages from various ocean disasters, INCOIS provides early warning services for extreme weather conditions like cyclones, high wave/swell conditions, tsunamis, storm surges, etc. based on multi-model operational forecasting system supported by real-time data reception from heterogenous ocean data platforms such as tsunami bottom pressure recorders, seismic stations, tide gauges, gliders, Argo profiling floats, moored and drifting buoys, etc. The Indian Tsunami Early Warning Centre (ITEWC) established at INCOIS in October 2007 carries out operations on 24 x7 and detects tsunamigenic earthquakes within 10 minutes of their occurrence and disseminates the advisories as per the Standard Operating Procedure (SOP) to the concerned authorities. The efficiency of operations at ITEWC ensured avoiding false alarms and unnecessary evacuations. INCOIS also generates storm surge simulations during cyclone events, issues High Wave/Swell/Surge alerts and high ocean currents alerts/warnings during any extreme/rough conditions in the ocean. In addition to helping with early warnings, INCOIS helps in Coast Guard, Navy and coastal Security Police to minimize loss of life, injury, and property damage through Search and Rescue Aided Tool (SARAT) that predicts most probable search area for missing persons/objects at sea and with Oil Spill Advisory services to predict the trajectory of oil spill during any event of oil spill in the ocean that helps the relevant stakeholders in taking up the clean-up and control measures. The safety of the fishermen at sea is

ensured by providing these crucial information services on ocean disasters including boat specific safety information through Small Vessel Advisory services.
The services of INCOIS aimed to have immense socio-economic benefits for a wide range of stakeholders and particularly to enhance the lives and livelihoods of coastal communities.

Eco-system Services:

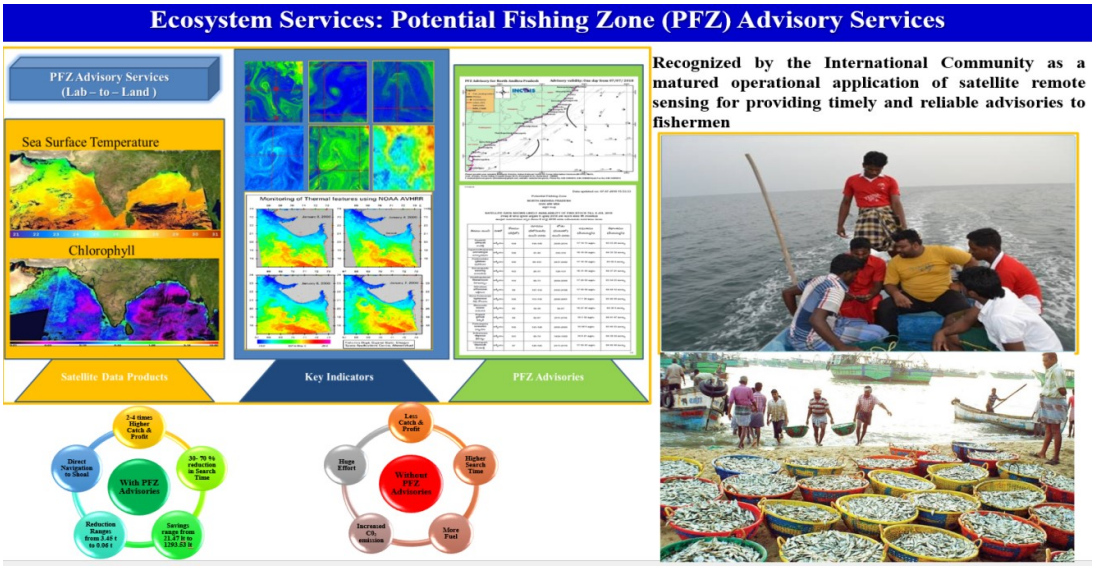
Potential Fishing Zones (PFZ) Advisories:

Objective: To provide optimal fishing locations through Satellite data to Fishermen

Description: Potential Fishing Zones (PFZ) Advisories provides information on the location of aggregation of fishes in the ocean using satellite data. The services are provided on a daily basis except during fishing ban period and adverse sea conditions.

Advisories in user friendly local language to all coastal states are being disseminated in daily basis. Now the service is extended to issue species specific advisories such as Tuna advisories. R&D to issue hilsa advisories is under progress.

Users: Fishermen, fisheries departments, fishing industry professionals, fisheries organizations, Project Investigators, NGOs and coastal communities

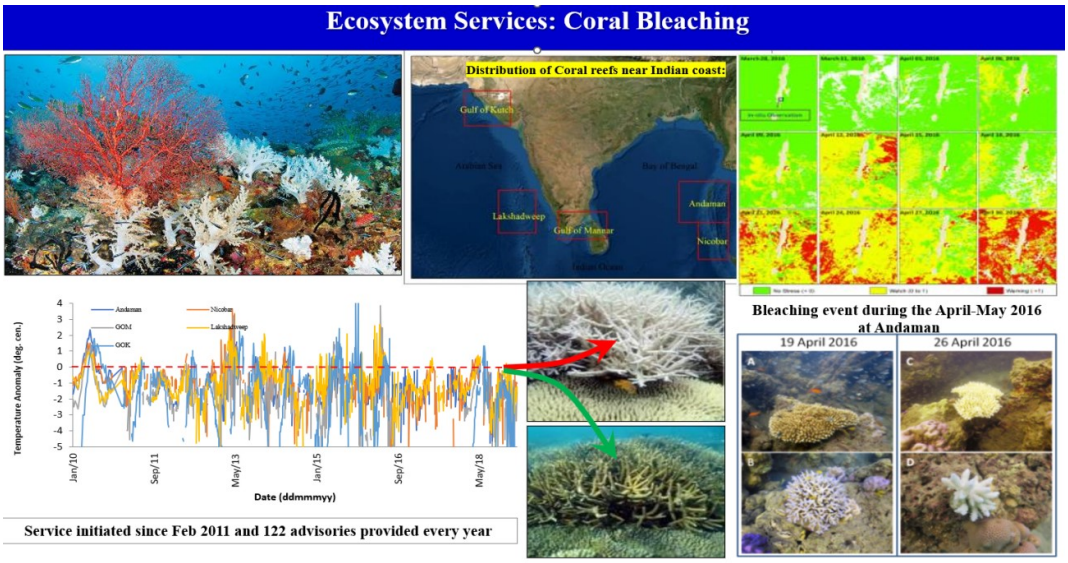


Coral Bleaching Alerts System (CBAS)

Objective: To provide early warnings of potential coral bleaching using satellite data, helping protect coral ecosystems and supporting climate resilience efforts.

Description: Coral Bleaching Alerts System (CBAS) assesses the thermal stress accumulated in the coral environs using the satellite derived Sea Surface Temperature (SST) This information yields in drawing the early signs of the intensity and spatial extents of coral bleaching. The service CBAS disseminated once in three days, comprising the Hotspot, Degree of Heating Weeks and time series products.

Users: Marine conservationists, environmental agencies, researchers, ecologists, tourism operators, disaster management Organisations, and coastal communities.

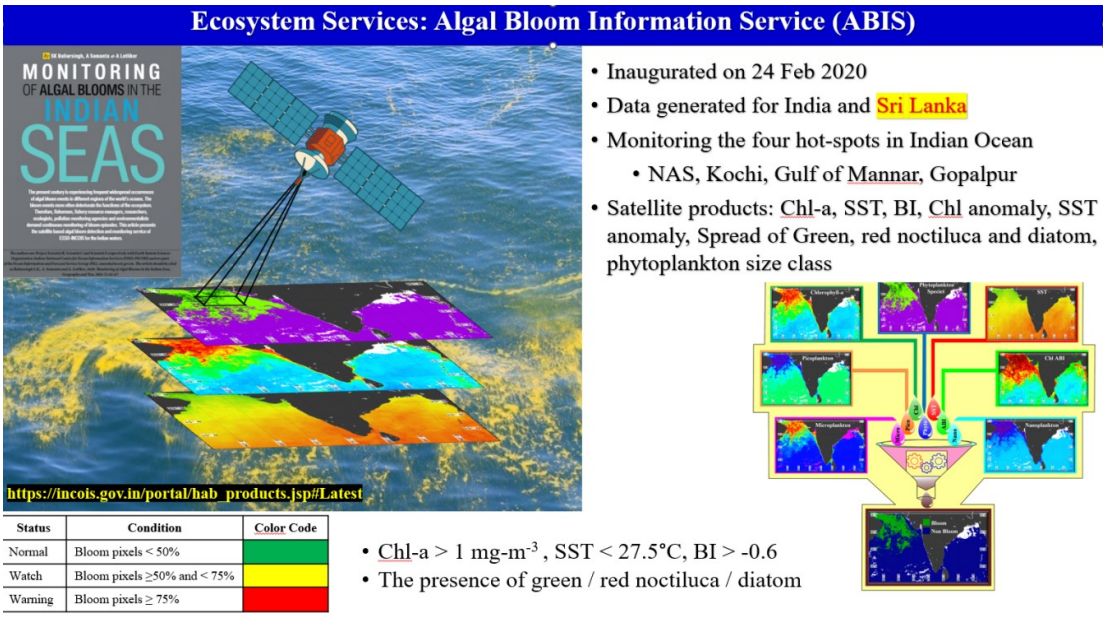


Algal Bloom Information Services (ABIS)

Objective: To provide real-time monitoring and forecasting of harmful algal blooms to safeguard marine ecosystems and public health.

Description: detects and monitors the blooms in the Indian Ocean. ABIS provides near real time information on spatio-temporal existence and spread phytoplankton bloom over North Indian Ocean. Daily satellite retrieved standard mapped images of sea surface temperature, chlorophyll, Algal Bloom Index - chlorophyll, Bloom Index, rolling chlorophyll anomaly, rolling sea surface temperature anomaly, phytoplankton class/species, phytoplankton size class and a composite image delineating bloom and non-bloom regions for the above-mentioned region is being disseminated through ABIS.

Users: Fishermen, coastal communities, marine researchers, environmental protection agencies, Project Investigators, NGOs and public health authorities concerned with water quality and marine safety.

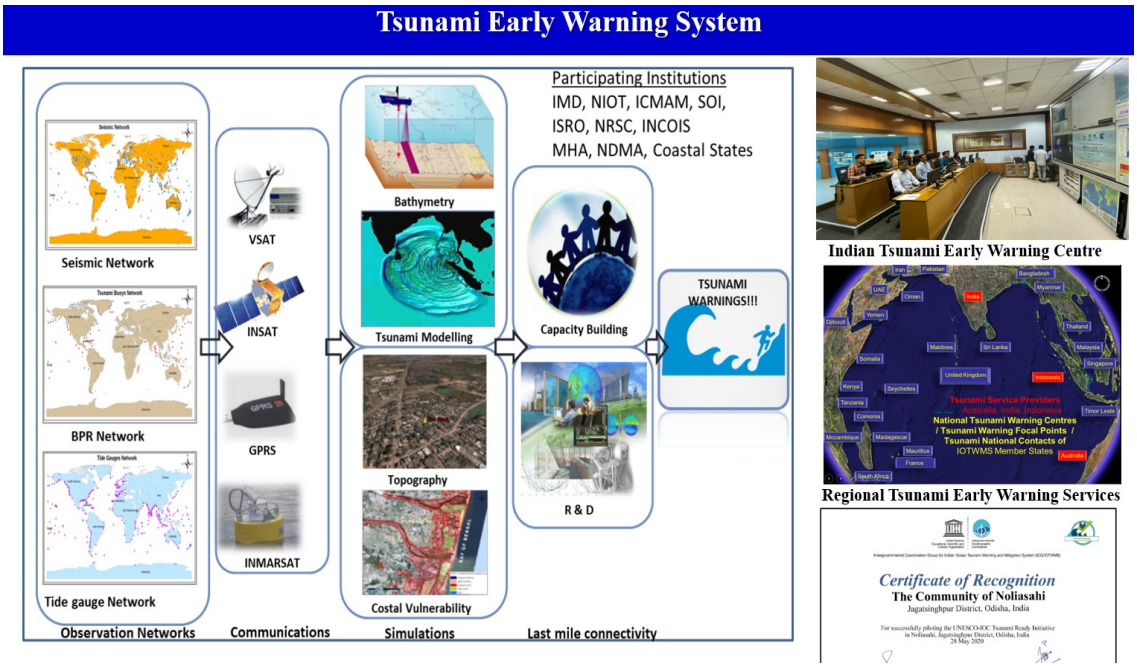


Multi-Hazard Services:
Tsunami Early Warning Services

Objective: To provide real-time tsunami advisories using seismic, sea-level data, and modeling to mitigate risks and ensure coastal community safety.

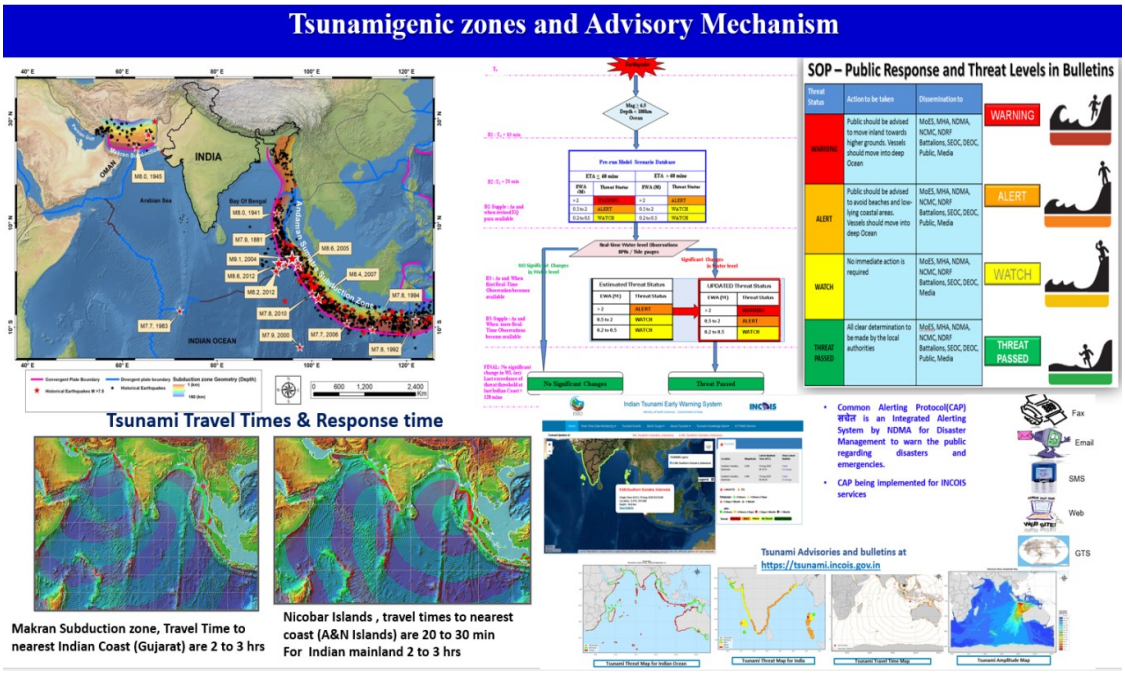
Description: The Indian Tsunami Early Warning System established in 2007, following the devastating Indian Ocean Tsunami on 26th December 2004, the state-of-the-art Indian Tsunami Early Warning Centre (ITEWC) established with all the necessary computational and communication infrastructure enables reception of real-time data from all the sensors, analysis of the data, generation and dissemination of tsunami advisories following a Standard Operating Procedure (SOP). The system has been made operational on October 15, 2007. The ITEWC can detect tsunamigenic earthquakes occurring in the Indian Ocean and the Global Oceans within 10 minutes of the occurrence of the earthquake and disseminates tsunami advisories to the concerned national and state disaster management authorities through various modes of communication for enabling timely public response. The ITEWC has also been identified by UNESCO's Intergovernmental Oceanographic Commission (IOC) as one of the Tsunami Service Providers (TSP) for the entire Indian Ocean region. In this capacity, the centre has provided tsunami advisories to 26 countries in the Indian Ocean rim since 2012. ITEWC has been recognized as one of the best tsunami warning centres in the world.

Users: Disaster Management Authorities, National tsunami warning centres, Navy, Coast Guard, Coastal Communities, Government Agencies, Maritime and Shipping Industry, Ports and Harbours, Critical installations, International Organizations, Public, Fisherman, Tourists, Researchers. Scientists, etc.



Indian Tsunami Early Warning Centre

Regional Tsunami Early Warning Services



Ocean State Forecasts (OSFs)

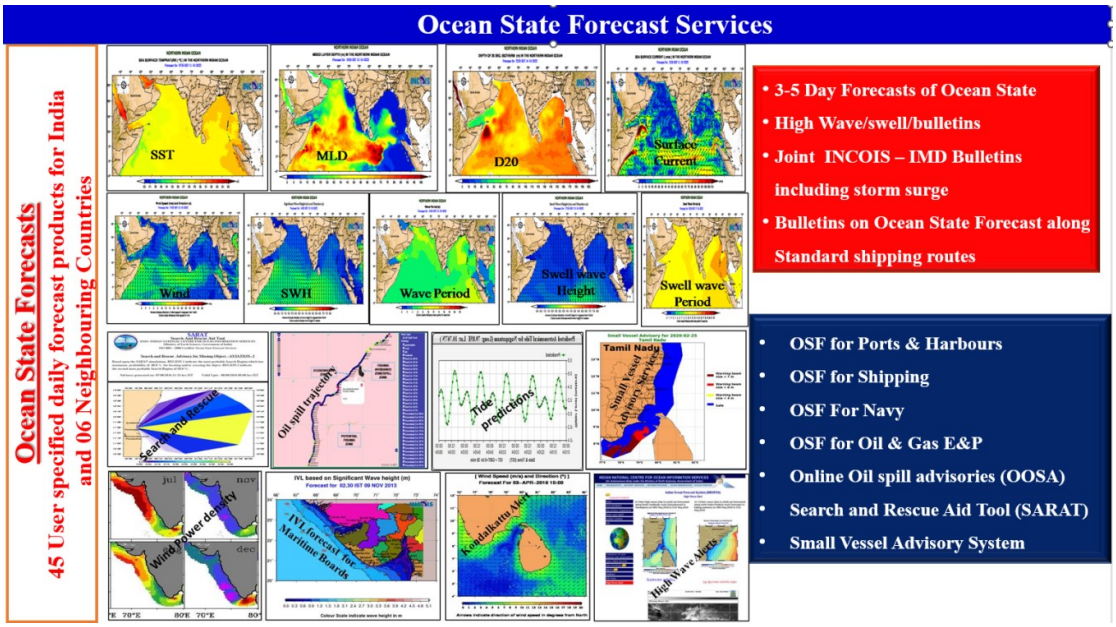
Objective: To provide real-time, user-specific ocean condition forecasts, including waves, swell, currents, winds, SST, etc. through numerical models and ocean observations.

Description: Ocean State Forecasts (OSF)provides information on winds, waves, ocean currents, water temperature, etc. at every 3/6 hours on a daily basis for the next five days These forecasts are generated using numerical models and used for safety at sea.

INCOIS operationally runs a suite of wave and ocean general circulation models at different resolutions to provide early warning services to maritime stakeholders. Recognizing the role played by INCOIS in issuing forecasts for the region, the WMO Executive Council at its seventy-sixth session (EC-76) adopted the designation of RSMC Indian National Centre for Ocean Information Services (INCOIS) (India) for numerical ocean wave prediction and global numerical ocean prediction.

In addition to providing services to IO Rim countries INCOIS extended its ocean forecast services to pacific island countries in coordination with Sustainable Coastal and Ocean Research Institute (SCORI).

Users: Fishermen, the Indian Navy, the Indian Coast Guard, merchant and passenger shipping agencies, offshore oil and gas exploration companies, regional users, RIMES, SAHF, research organizations, and other coastal communities.



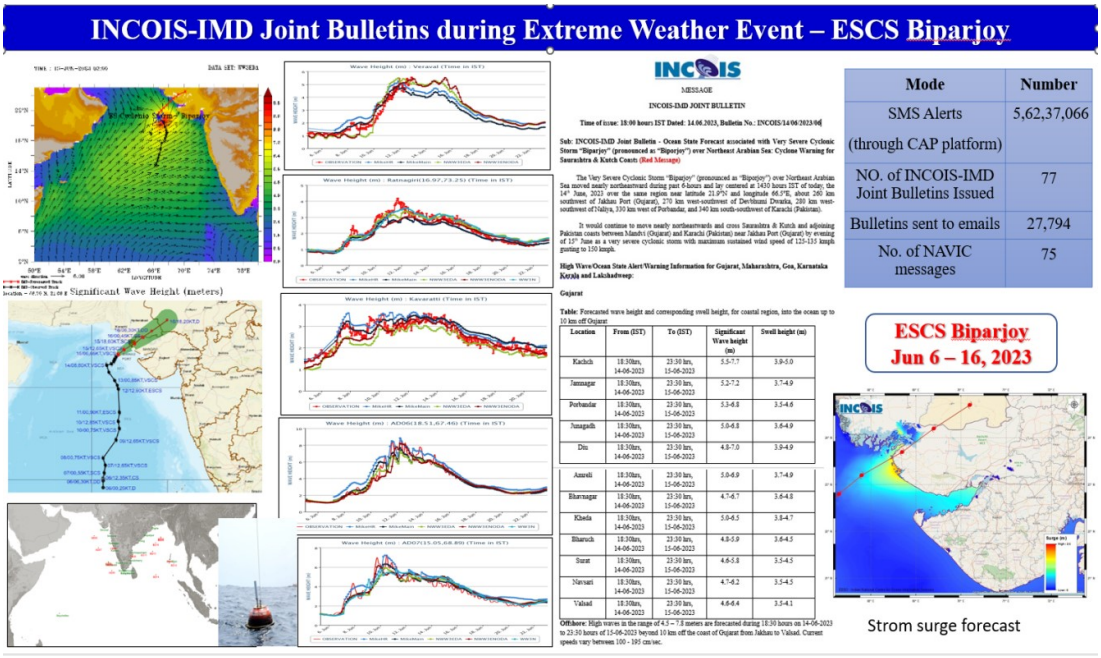
High Wave/Swe Surge/ Ocean Currents Alerts/Warnings

Objectives: To provide ocean condition and related alerts for coastal public safely

Description: High Wave Alerts provides alerts / warnings are provided during extreme / rough weather conditions in the ocean. The service provides details about the coast that may be impacted and duration of high waves, ocean currents, etc.

During any Topical Cyclones, INCOIS issues the joint advisory along with IMD for the fishermen and coastal population on the impending storm to the Indian coasts.

Users: Fishermen, Disaster Management Authorities, Coastal Communities, Maritime and Shipping Industry, Ports and Harbours, Public, Tourists, Researchers. Scientists, etc.



Storm Surge Early Warning Service

Objective: To provide timely alerts about coastal flooding risks caused by cyclones, helping communities prepare, mitigate impacts, and enhance coastal safety.

Description: Based on the ADCIRC model, it is provide expected maximum storm surge and expected maximum inundation extent.

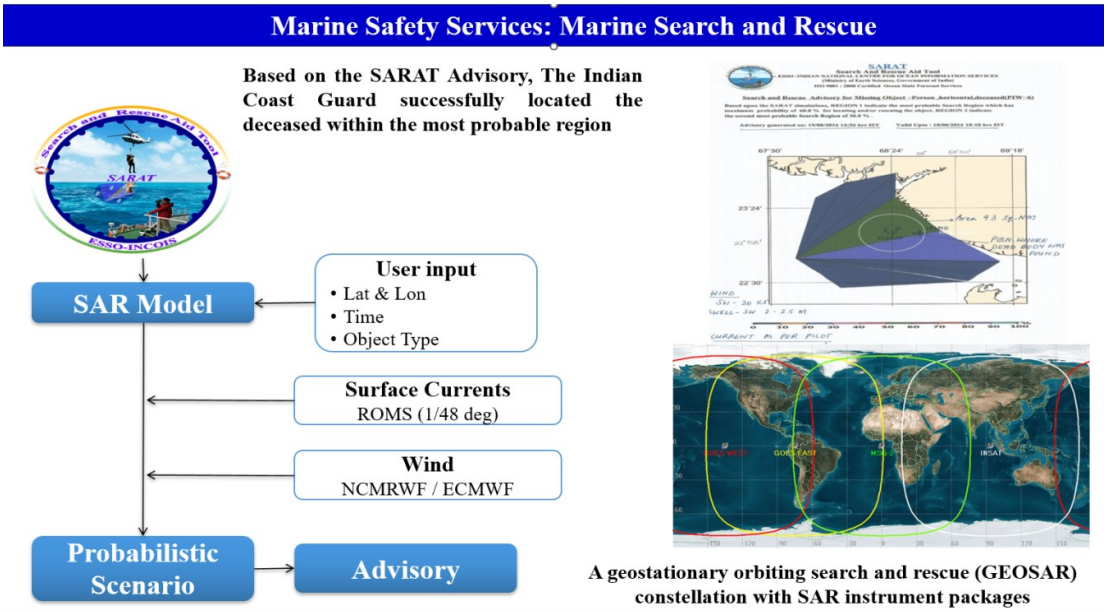
Users: Disaster Management Authorities, IMD, Navy, Coast Guard, Coastal Communities, Government Agencies, Coastal Residents and port authorities.

Search And Rescue Aided Tool (SARAT)

Objective: The SARAT utilizes advanced modeling techniques and high-resolution oceanographic data to predict the movement of missing objects at sea.

Description: Search And Rescue Aided Tool (SARAT) developed mainly to find out the most probable Search Area for missing persons/objects at Sea. Users will be able to select 60 types of missing objects such as person in water, life raft, fishing boat, aviation, surf boat, sail boat etc. Users can select a specific Point where the object is missed using the interactive map or they can select a coastal location, distance travelled and bearing angle so that the missing point is calculated. The results generated are shown in an interactive map depicting the probable area to be searchedand also send as a text message. SARAT system is mainly to facilitate the Indian Coast Guard, Navy and coastal Security Police in their operations to minimize loss of life, injury, and property damage.

Users: Coast Guard, search and rescue teams, and maritime safety organizations.

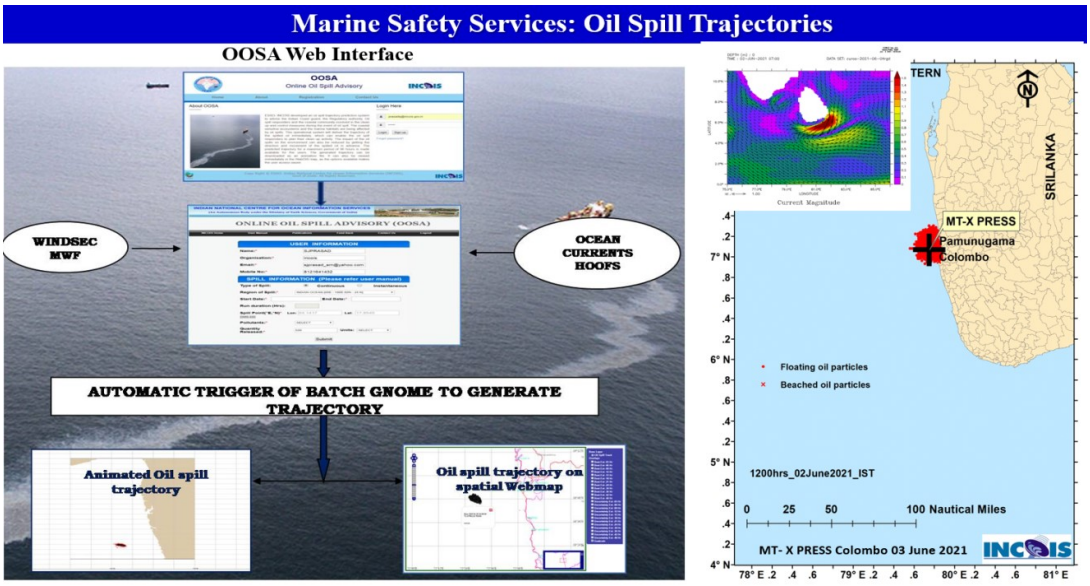


Online Oil Spill Advisory (OOSA) Services

Objective: The Oil spill Advisory System is a web module to issue online oil spill trajectory prediction during the event of oil spills.

Description: Online Oil Spill Advisory Services predicts the trajectory of oil spill during any event of oil spilled in the ocean. The system uses oil spill trajectory model, general circulation models, atmospheric models and geographical information system. In the case of oil spill, the direction and movement of the oil will be predicted in advance and will be disseminated to the relevant stakeholders for takin up the clean up and control measures.

Users: Coast Guards, Environmental agencies, maritime industries, and coastal managers, etc.

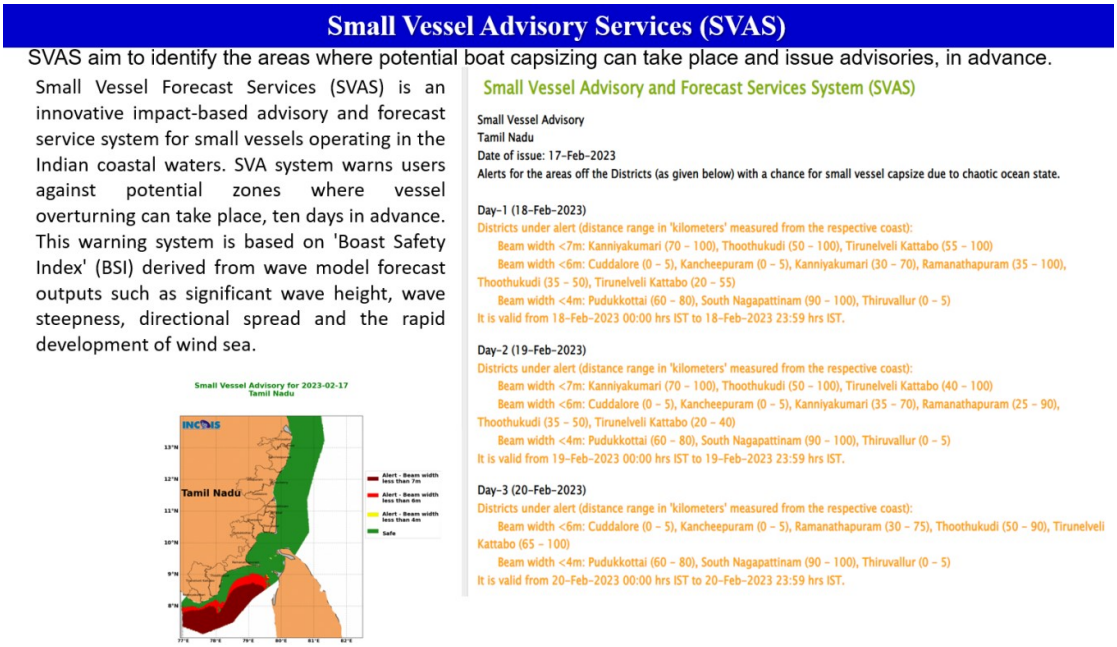


Small Vessel Advisory Services (SVAS)

Objective: SVAS is an innovative impact-based advisory and forecast service system for small vessels operating in the Indian coastal waters

Description: Small Vessel Advisory Services (SVAS) enhances the safety of the fishermen at Sea, by providing boat-specific safety information to help the fishermen in avoiding the regions that cause capsizing of the boats.

Users: Small vessel operators, fishermen, and maritime safety authorities, etc.



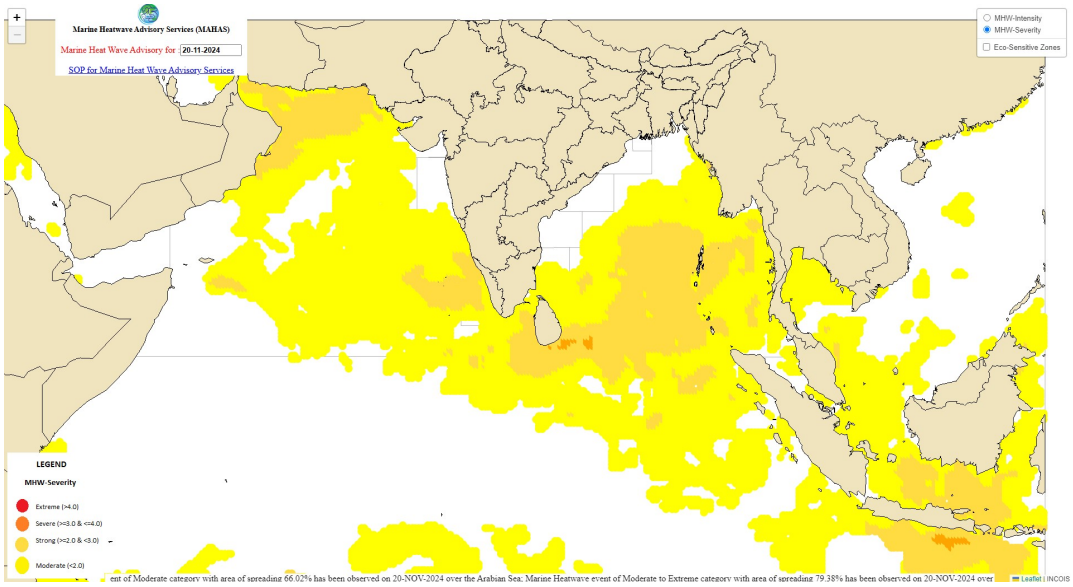
Marine Heatwave Advisory Services (MAHAS)

Objective: The Marine heatwave is a discrete, prolonged, anomalously warm water event. These advisory services provided through a web interface for the Indian Ocean rim countries can help

understand the impact of Marine habitat and the frequency and intensity of disaster events in the region.

Description: Marine Heat Wave Advisory (MHWA) service on daily basis comprises the parameters Intensity of Marine Heat Wave (IMHW), MHW categories (MHWCAT), percentage of the area of MHW spread over the different basin and sector over the Indian Ocean and south China Sea through the web interface for users. These advisory services can be helpful for understanding the impact of Marine habitat and the frequency and intensity of disaster events for Indian rim country and research communities.

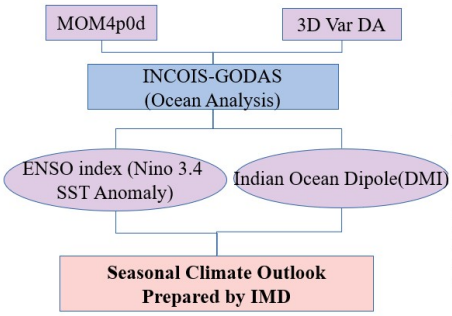
Users: Fishermen, coastal communities, marine researchers, environmental protection agencies, Project Investigators, NGOs and public health authorities concerned with water quality and marine safety.



Ocean Climate Change Advisory Services:

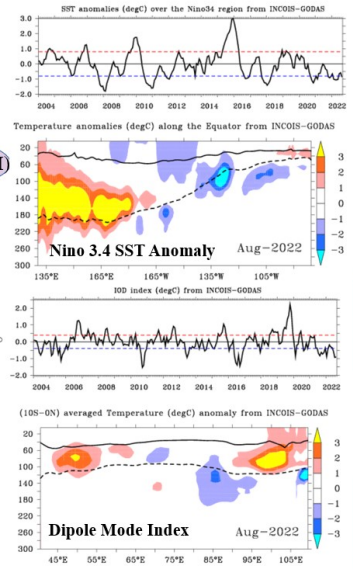
INCOIS is also a nodal agency for the implementation of Ocean Climate Change Advisory Services (OCCS) a vertical of Deep Ocean Mission (DOM). The objectives of this Mission are to use state-of-the-art ocean models and observations to make projections of sea level rise along the Indian coast under different climate change scenarios. This project will identify vulnerable areas and produce maps of potential flooding due to sea level rise in the coming decades.

Climate Services – Ocean Climate Indices



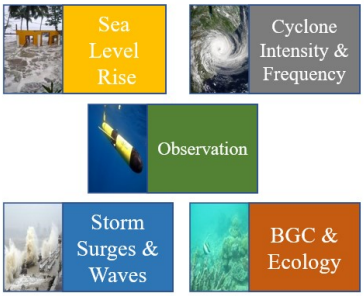
Indian Ocean Dipole Index based on INCOIS-GODAS SST analysis and Monthly climatology of OISST (Reynolds sst;constructed using 1981-2010 data).

	WESTERN BOX 10S-10N 50E-70E		EASTERN BOX 10S-Eq 90E-110E		DMI WEST-EAST
DD-MMM-YYYY / SNO:	SSTA	SST	SSTA	SST	SSTA
14-SEP-2021 / 1:	0.0330	27.67	0.6630	28.74	-0.6300
15-OCT-2021 / 2:	0.0024	28.09	0.7326	28.93	-0.7301
14-NOV-2021 / 3:	0.0327	28.40	0.6681	29.17	-0.6354
15-DEC-2021 / 4:	-0.0165	28.26	0.3564	29.04	-0.3729
14-JAN-2022 / 5:	-0.0329	28.00	0.8504	29.64	-0.8833
14-FEB-2022 / 6:	-0.2281	28.37	0.2007	29.20	-0.4288
16-MAR-2022 / 7:	-0.0203	28.98	0.1636	29.36	-0.1838
16-APR-2022 / 8:	0.2851	30.02	0.5911	30.08	-0.3060
16-MAY-2022 / 9:	0.2053	29.69	0.5455	30.05	-0.3403
15-JUN-2022 / 10:	-0.1069	28.19	0.4521	29.69	-0.5590
16-JUL-2022 / 11:	-0.4766	27.02	0.4536	29.19	-0.9303
15-AUG-2022 / 12:	-0.2725	27.03	0.6288	28.91	-0.9013



Ocean Climate Change Advisory Services of Deep Ocean Mission

- Regional Climate Change Assessment for Northern Indian Ocean
- Future Projections of important climate variables and their Impact on coastal regions of India
  - Sea level
  - Cyclones, Storm Surges, Waves
  - Marine Ecosystem



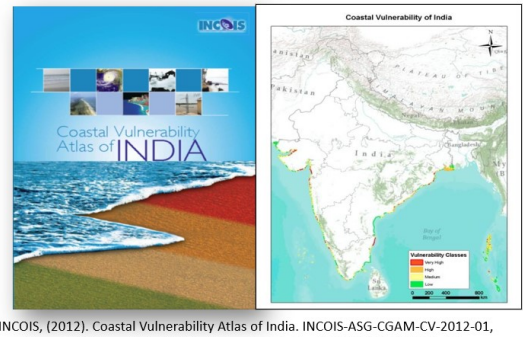
Coastal Vulnerability Maps:

As part of the preparedness component of the tsunami warning system, INCOIS carried out coastal vulnerability index (CVI) mapping and coastal multi-hazard Vulnerability Mapping (MHVM). CVI atlas for the entire Indian coast comprising 156 maps on a 1:1lakh scale. Besides, Multi-hazard vulnerability mapping was carried out based on a holistic approach to estimate the composite hazard line based on the synthesis of Extreme Water Levels, Sea-level Change, Shoreline Change Rate and high-resolution topography data in a GIS environment. These maps represent the coastal inundation due to oceanogenic disasters. A total of 1054 MHVM maps on a 1:25000 scale were generated for the entire Indian Mainland including Andaman and Nicobar Islands. These these maps will form a basis for coastal disaster management that helps in taking appropriate mitigation measures to build resilient coastal communities against oceanogenic disasters.

Coastal Multi Hazard Vulnerability Assessments

Coastal Vulnerability Atlas

1:1,00,000 scales

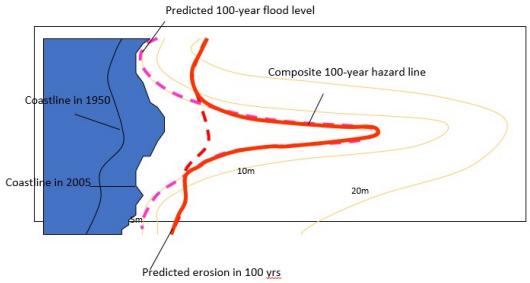


INCOIS, (2012). Coastal Vulnerability Atlas of India. INCOIS-ASG-CGAM-CV-2012-01, Pages 212, Maps 156, INCOIS, Hyderabad, India. ISBN 978-81-923474-0-0.

Parameter	Data
Geomorphology	IRS LISS-IV
Slope	GEBCO
Elevation	SRTM / CartoDTM (10 M) / ALTM (5 M)
Tidal Range	Astronomical tide from WXTide-32
Shoreline Change Rate	Landsat data (57-30 M)
Sea-level change, Extreme Water levels	Long term tide gauge observation
Significant Wave Height	Mike-21 SW modeling

Multihazard Vulnerability Atlas

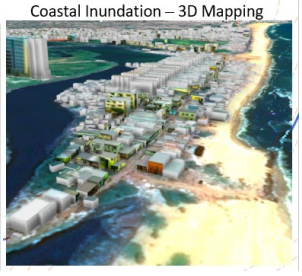
1:1,25,000 Scale

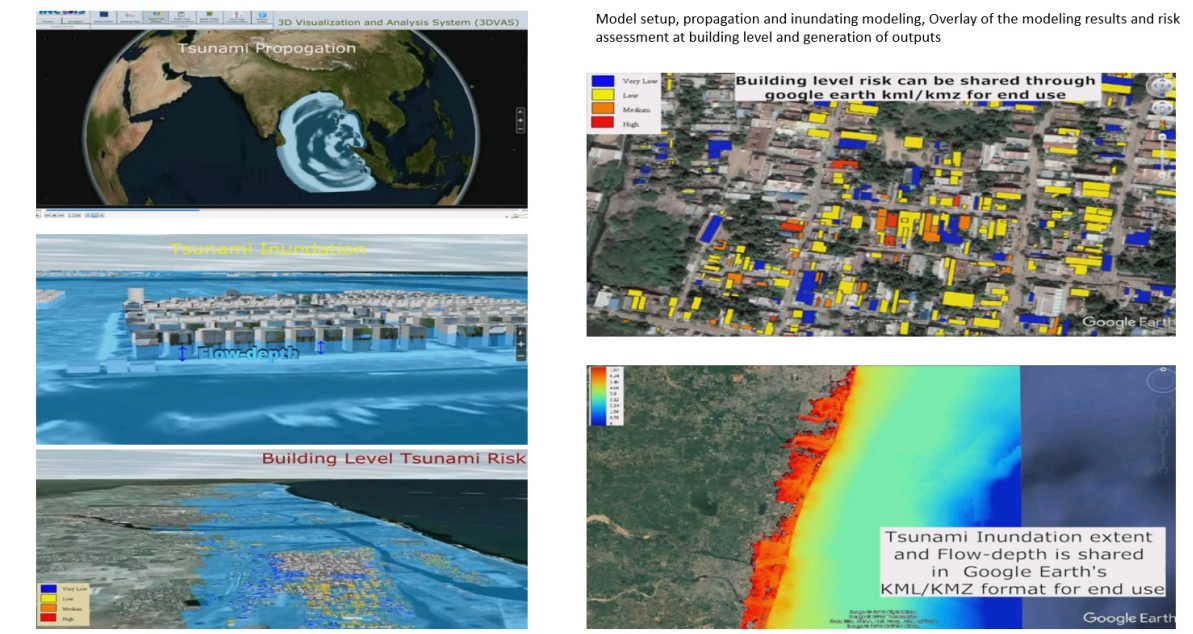


Projected Coastal flooding due to Tsunami, Cyclone, Floods, Sea Level Rise and Erosion

Multi-hazard Vulnerability Map

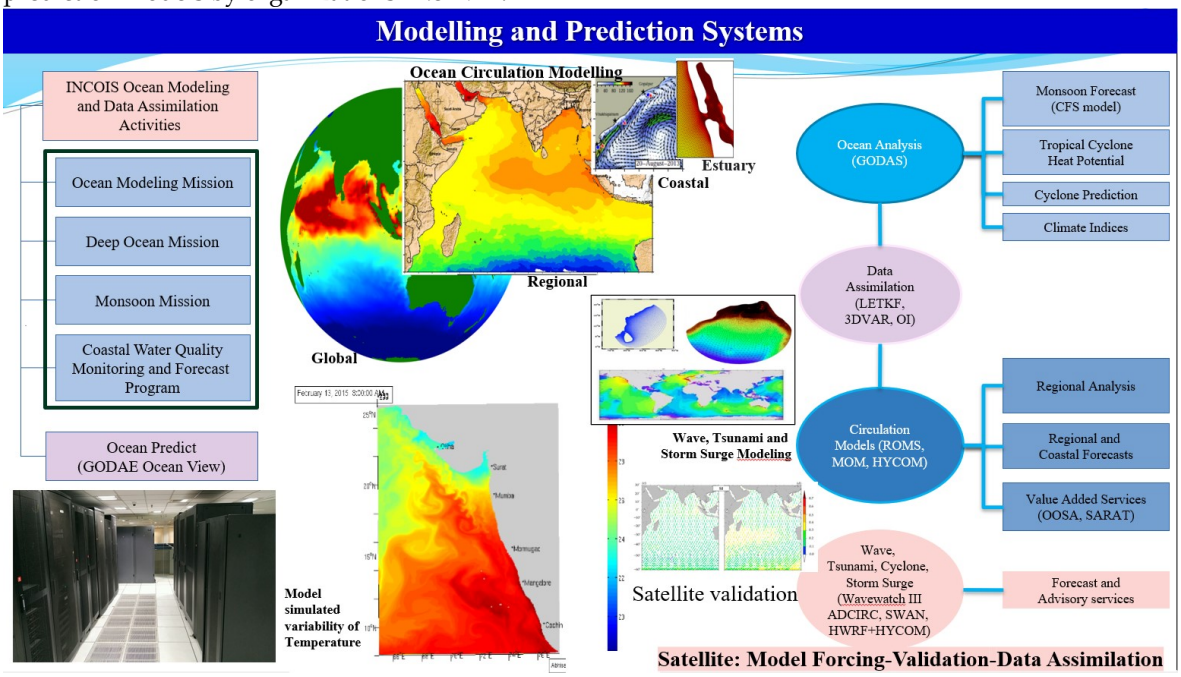
Coastal Inundation – 3D Mapping





Numerical Ocean Modeling:

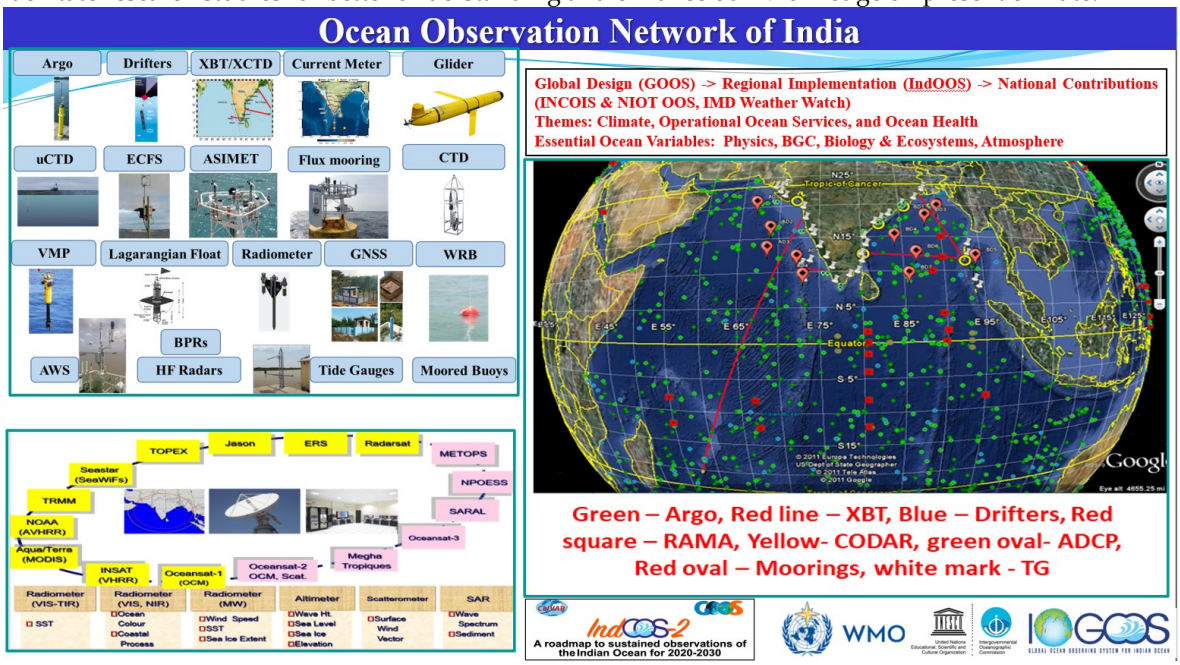
This activity in INCOIS is aimed at configuring the models and data assimilation systems to predict various ocean parameters such as waves, currents, tsunami, storm surge, temperature, salinity, sea level etc. A suit of numerical models such as Modular Ocean Model, Hycom, Regional Ocean Modeling System, Wavewatch III, SWAN and ADCIRC models are configured at INCOIS for this purpose. Apart from using these models for issuing operational ocean state forecasts, the ocean analysis products generated by the combination of Ocean General Circulation Models (OGCM) and data assimilation systems are used to force/initialize monsoon forecast models and cyclone prediction models by organizations like IMD.



Ocean Observation Network (OON):

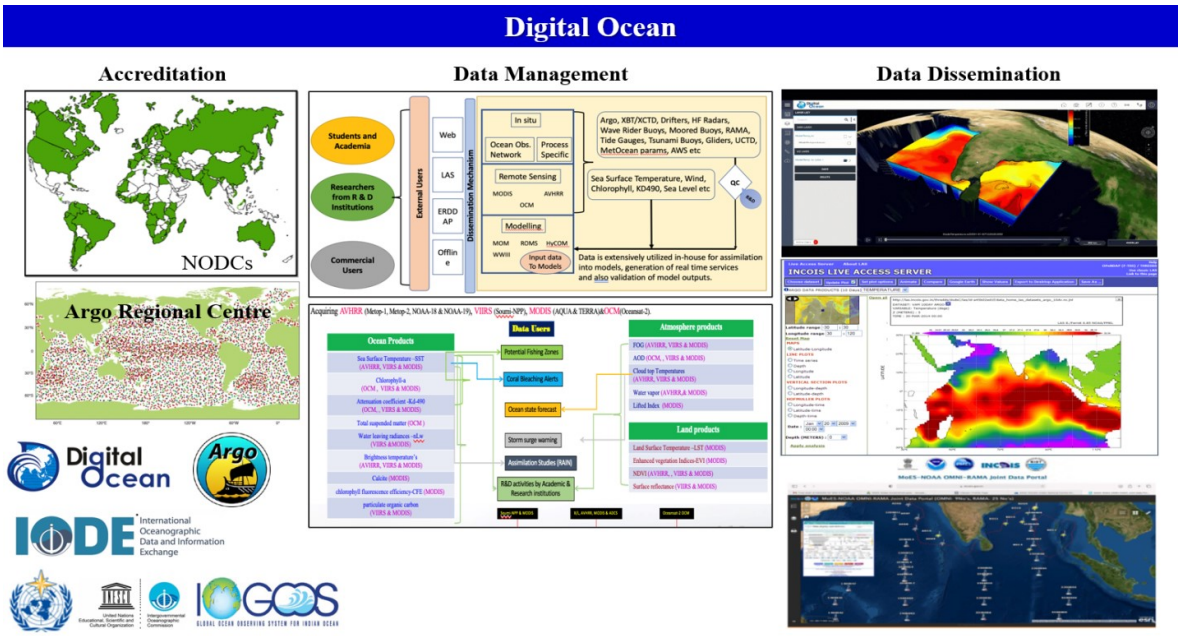
The primary objective of Ocean Observation Network (OON), is to establish and maintain various in-situ observation platforms, such as Argo floats, satellite-tracked surface drifting buoys (drifters), expendable bathythermograph/expendable conductivity temperature depth (XBTs/XCTDs), ship-board Automated weather stations (AWSs), equatorial current meter array, open ocean tsunami

buoys (or Bottom Pressure Recorder (BPR)), Gliders, coastal Acoustic Doppler Current Profiler (ADCP) network and coastal wave rider buoys (WRBs) network and coastal sea level gauges (or Tide Gauges) network to collect near-surface marine meteorological and oceanographic (physical and biogeochemical) data in the Indian Ocean. OON is very much required to support various operational system developments such as data assimilation in the ocean general circulation models and atmospheric general circulation models, validation of ocean hindcast/forecast model outputs, development and improvements of ocean model parameterization schemes, validation of satellite-derived parameter and improvement of retrieval algorithms for the satellite-based measurements and facilitate research studies for better understanding and enhance our knowledge on present climate.



Ocean Data Services:

Data forms the backbone for all the services provided by INCOIS. The main aim of data services is to provide research quality data and derived products for performing high quality research on some of the active areas of research pertaining to Indian Ocean. Ocean data and services are used extensively for weather forecast activities and extreme weather events monitoring like tropical cyclones. Also, data services and products were used extensively by various R&D institutions, Academia, etc. Besides this information is helpful to policy makers and Government for better preparedness and mitigation strategy. Indian Navy and Coast guard are immensely benefited by using Marine Meteorological Atlas (MaMeAT), Sound Velocity Atlas (SoVeAt) and many other in house developed R&D products from heterogeneous data sets.



International Training Centre for Operational Oceanography (ITCOO):

ITCOO was set up in response to 'The Ocean Call' from Intergovernmental Oceanographic Commission (IOC)/UNESCO to cooperate in the capacity development activities for the benefit of African and IOR countries. In December 2017 the centre was approved to be Catergory 2 Centre (C2C) under UNESCO. The unique diversified training programs, designed and imparted at ITCOO are helping in generating skilled manpower in the field of operational oceanography. Under ITCOO, about 102 training courses were conducted and around 6,500 people attended the training courses.

Capacity Development:

As we cannot prevent a disaster, but its impact can be minimized and mitigated through timely warnings, preparedness, effective response, and public education. INCOIS conducts regular trainings/workshop, seminar to fishermen, disaster management officials, Indian Navy, Coast Guard, researchers, etc. to create awareness about livelihood, oceanic hazards and build all stakeholders' capacities of disaster management. INCOIS also conducts regular communication tests and mock tsunami exercises in coordination with NDMA and MHA to test the efficiency of communication links and strengthen the readiness of disaster management institutions and the public to handle tsunami emergencies. To enhance community preparedness, INCOIS is also coordinating the implementation of the UNESCO-IOC "Tsunami Ready Recognition Programme" initiative. INCOIS assisted the Odisha State Disaster Management Authority (OSDMA) in successfully recognizing Venkatraipur and Noliasahi villages as Tsunami ready communities by the UNESCO-IOC. India is

the first country to achieve this distinction in the Indian Ocean region. Other coastal states of India (Gujarat, Kerala, Tamil Nadu, Puducherry, West Bengal and Andaman & Nicobar Islands) are impending this preparedness in their respective countries. Odisha implemented 24 more villages and applied for UNESCO recognition as Tsunami Ready communities.

The last one conducted activities information mentioned below:

Capacity Building Activities

- IOWave 23: IOwave23 in Oct 23, Makran & Andaman Events, 40,000 evacuated from TN, OD, PC, AN
- WTAD 23: Odisha Tsunami Drill, Open Day, Science Model, Eloctution & Drawing Competitions
- Social Media Competitions; Online Webinars from International Experts
- 2D & 3D Selfie Points; Films, Calendar, Infographic Book

UNESCO-IOC Tsunami Ready Recognition

- INCOIS supporting to implement UNESCO-IOC Tsunami Ready Programme in India
- Venkatraipur and Noliasahi of Odisha recognized as Tsunami Ready communities by IOC-UNESCO.
- India is the first country Tsunami Ready programme in the Indian Ocean region.
- Recently, OSDMA implemented the Tsunami Ready programme in 24 coastal villages of 6 coastal districts of Odisha. The NTRB has evaluated these 24 villages readiness and recognised the as National Tsunami Ready Communities. UNESCO-IOC recognised all 26 villages as Tsunami Ready Communities on the international platform as part Global Tsunami Symposium on 11 November 2024 at Banda Aceh, Indonesia.

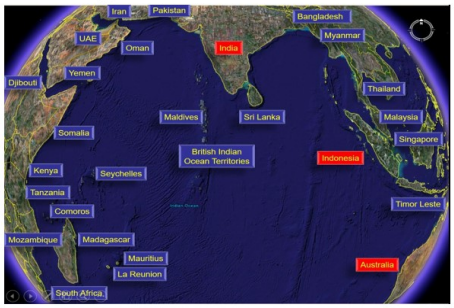
International Interface and Services:

INCOIS has developed several innovative ocean services and providing to stakeholders leading to its global recognition as well as expanding its services to Indian Ocean regional stakeholders as well as to the global stakeholders. INCOIS has been recognized by UNESCO-IOC as one of the Tsunami Service Providers (TSP) for Indian Ocean and provides Tsunami Advisories to India and 26 Indian Ocean rim countries. INCOIS has been recognized as Regional Specialized Meteorological Centre (RSMC) by World Meteorological Organization (WMO) for Numerical Ocean Wave Prediction and Global Numerical Ocean Prediction for the Indian Ocean. As part of the services, INCOIS forecasts parameters such as significant wave height, swell wave height, wind sea height, mean wave period, peak wave period, swell period, wind sea period, principal wave direction, wave steepness, directional spreading, ocean currents, temperature, salinity, mixed layer depth, tropical cyclone heat potential and sea surface height. India is the first country recognized as RSMC for Ocean Services.

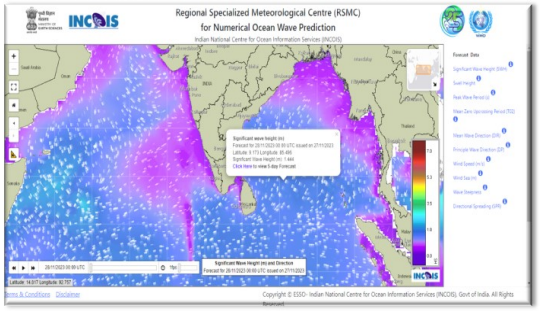
INCOIS also providing Ocean Services to 14 Pacific Islands Countries. INCOIS provides services to RIMES member states, Colombo security conclave, etc.

Ocean Services for International users

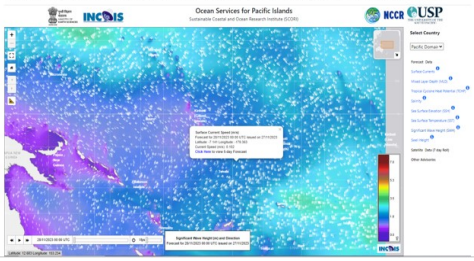
Regional Tsunami Early Warning Services for Indian Ocean Region under IOTWMS of UNESCO-IOC



Regional Specialized Meteorological Centre (RSMC) services for Indian Ocean under WMO framework



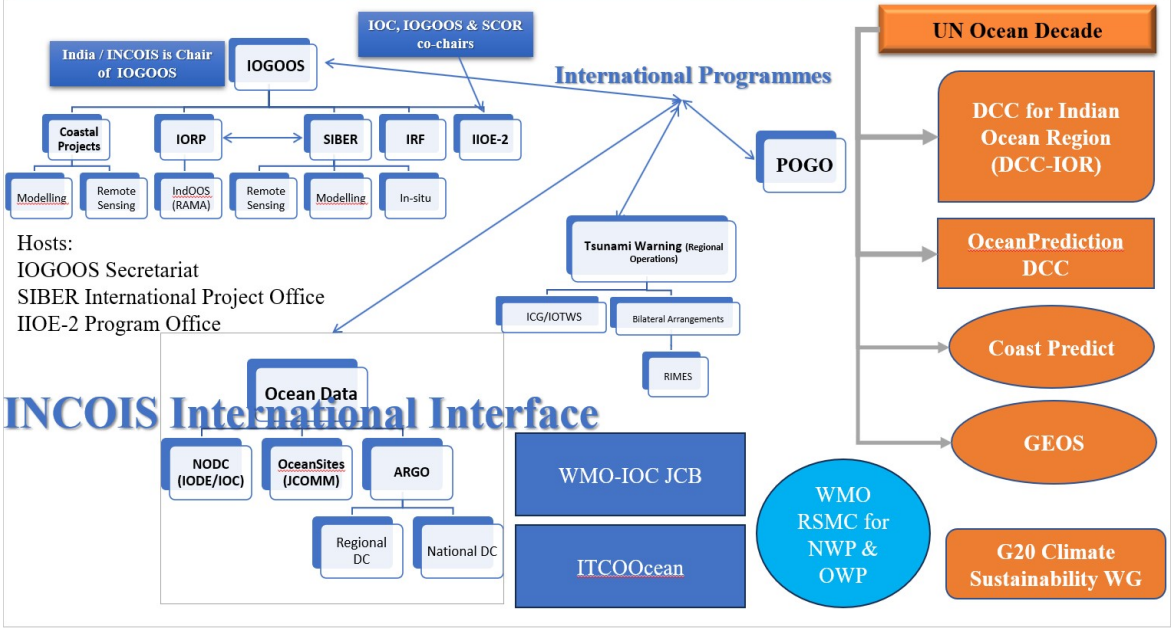
Ocean Services for Pacific Island Countries



- **Tsunami Services for Indian Ocean region**
- **Ocean RSMC services fir Indian Ocean**
- **Ocean services for Pacific Islands countries**
- **Ocean Services for RIMES member states**
- **Ocean Services for CSE countries**

INCOIS has strong association with the Intergovernmental Coordination Group (ICG) of Indian Ocean Tsunami and Mitigation Warning System (IOTWMS) of the Intergovernmental Oceanographic Commission (IOC)/UNESCO, the Indian Ocean Global Ocean Observing System (IOGOOS), Regional Co-ordination of Argo Programme, Partnership for Observation of Global Ocean (POGO) and Regional Integrated Multi-hazard Early warning System (RIMES). INCOIS continue to host the secretariats of IOGOOS, Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER) and Ocean Bio-Informatics System (OBIS). In addition, the Indian node of Joint Programme Office (JPO) for IIOE-2 has been hosted at INCOIS to coordinate the project jointly sponsored by IOC, SCOR and IOGOOS. This international interface helps INCOIS in achieving SDG 17 in partnership in goals.

INCOIS International Interface



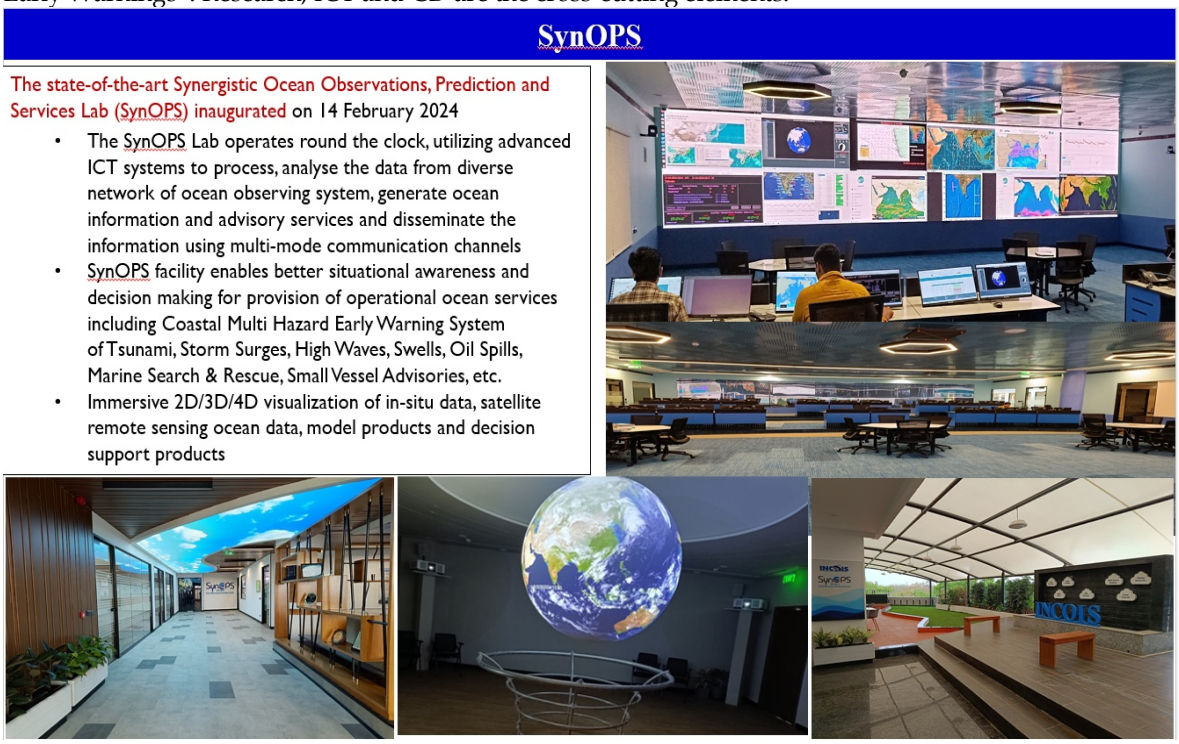
Synergistic Ocean Observation Prediction Services (SynOPS):
Towards enhancing these societal services and/or to bring in more services, INCOIS adopts evolving state-of-art technologies and research outcomes from in-house scientists as well as national and international research in every element of the ocean value chain that includes Ocean Observing

Systems, Data Management Systems, Ocean Modelling systems and up to Operational Services. In the Ocean Observing systems, INCOIS brought new robotic equipment's such as Gliders, the data integration, visualization and on-fly analysis was made ease with development of digital ocean, the quality-controlled data from the observation platforms were assimilated into numerical models thereby enhancing the accuracy of the ocean forecast services and prediction of ocean disasters such as swell surges, high waves, small vessels safety, etc. All these new science and technological interventions have improved the availability of data for analysis, tools for easy interpretation, and improved accuracies for forecasting ocean disasters 5 to 7 days in advance. The availability of information / advisory / forecast at laboratory is of no use unless it reaches the end user.

While building all these developments, the decentralized mechanisms in place are also noticed and the need to spend lot of effort in coordinating, analyzing and monitoring its activities spread across entire ocean value chain starting from observations to services. Keeping in view of this and to enable a comprehensive view of all these components across the entire ocean value chain, the 'Synergistic Ocean Observation Prediction Services (SynOPS)'has been established.

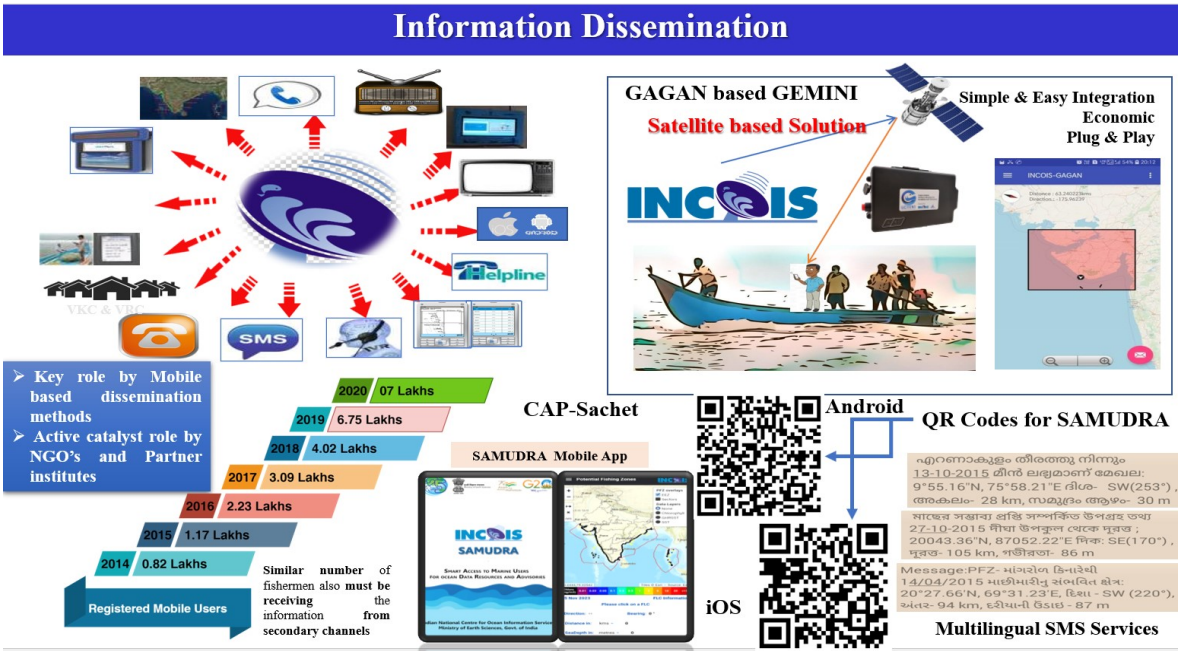
A state-of-the-art facility SynOPS was established in February 2024 within a short span of 72 days with effective project management and coordination. The 'SynOPS' enables immersive visualization of in-situ data, satellite remote sensing ocean data, model products and decision support products to provide an integrated view of the past, present and future state of the ocean to scientists, operational forecasters and policy makers. The SynOPS includes Globe for the digital age – Science on Sphere that is equipped with servers and projectors to enable 3D visualization of INCOIS ground stations data, Modeled data and planetary data on a sphere. This newly established SynOPS facility enabled better situational awareness and decision making for provision of operational ocean services, especially those related to ocean and coastal hazards including Tsunami, Storm Surges, High Waves, Swells, Oil Spills, Marine Search & Rescue, Small Vessel Advisories, etc. It also facilitated remote sharing of content and receive online feedback during events for better decision making.

The main outcomes / deliverables "Observation Networks", "Data Systems including Digital Ocean", "Unified Modelling and Data Assimilation" and "Services including Ocean and Coastal Multi hazard Early Warnings". Research, ICT and CD are the cross-cutting elements.



Dissemination:

INCOIS disseminates ocean information and advisory services in various modes of communications such as Website, SMS, Email, Fax, GTS, EDB, VoIP, mobile App, Social media channels, etc.



SAMUDRA: Keeping in view of the timely dissemination of the services to various heterogenous stakeholders, INCOIS has developed a mobile application SAMUDRA - Smart Access to Marine Users for Ocean Data Resources and Advisories. The app allows easy access for the users to interpret ocean information. The app leverages the power of state-of-the-art technologies to deliver seamless user experience across multiple platforms, including Android, iOS, and Progressive Web Applications (PWA).

ANNEXURE-III SAMPLE SCRIPT/STORYBOARD TO BE DEMONSTRATED

This is a simplistic script/storyboard to create a demo (around 30 seconds) virtual reality application to be showcased to the technical evaluation committee during the bid technical evaluation phase.

Objective

The objective of this script is to highlight the benefits of the Tsunami Early Warning System setup by INCOIS.

High Level Interaction

An option to select a) Early warning from INCOIS (or) b) No warning from INCOIS

Scene 1

Visuals

A calm coastal village with a sandy beach, early morning (Bright Sky, Birds Flying, Fishermen setting off, School Kids Walking, Coastal Vegetation, Nearby Settlements, Realistic buildings and infrastructure along the coast)

Sounds

Peaceful beach sounds

Interactions

Move around the beach

Also observe the early signs of a tsunami (e.g., water receding).

Scene 1 transitions to Scene 2 or Scene 3 (based on the global user interaction) after some period/or some user interaction designed suitably

Scene 2 (If User selected early warning option from INCOIS)

Visuals

Local Disaster Management Office(A small room with officials can be shown): Get advisory from INCOIS (this can be displayed intuitively in the environment as suitable by maps lighting up etc.) about the impending Tsunami

Transitions to

Beach: Alarms & Tsunami Sirens (INCOIS logo may be put) ringing, public announcements made for people to evacuate (display evacuation boards prepared by Disaster management authority in collaboration with INCOIS suitably)

Suitably display the following precautions to be followed in the VR environment (Educational):

- *Move to higher ground*
- *Stay away from shore*
- *Listen to official updates*
- *Do not return until all-clear*

Sounds

Realistic conversational sounds (phone calls/alarms buzzing/tense conversations) at the disaster management office

Realistic sirens/announcement sounds etc.

Interactions

Move around the beach, interacting with warning systems like tsunami sirens or evacuation boards.

Scene 2 transitions to Scene 3 after some period/or some suitably designed user interaction

Scene 3

Visuals

Beach: Calm waves transition into high-energy tsunami waves, towering tsunami waves crashing onto the beach and flooding the area, Realistic debris flow and structural destruction, people getting washed away or impacted (in case user selected "No warning" option)

Suitably display the benefits of INCOIS early warning system in the VR application:

- *Saves lives by providing timely alerts before tsunami waves arrive.*
- *Enables early coastal evacuation, closure of ports, beaches, and tourist zones.*
- *Minimizes **economic losses** to ports, industries, fisheries, and coastal tourism.*
- *Protects **critical infrastructure** (power plants, refineries, communication hubs) by giving lead time to shut down safely.*
- *Prevents **secondary disasters** such as oil spills or chemical leaks triggered by flooding.*

Sounds

Roaring waves and crashing sounds during the tsunami's impact.

Suitable ambient sounds after the event while showing the disaster impact.

Interactions

Move around and examine areas showing the impact of the disaster.

ANNEXURE-4

Equipment Schedule for planning Interior furnishing works

#	Equipment	INCOIS	Birla
1	3D Stereoscopic Immersive Visualisation	8×8m	6×6m
2	Immersive Projection Room with 360^0Visual and Spatial Audio	6.5x6.5m	---
2	VR Headsets (10 units)	4×8m	4×8m
3	Multi-Touch Table + Projector	4×3m	–
4	Magic Book Zone	2×2m	–
5	4-Sided Holographic Display	3×4m	–
6	3-Sided Holographic Display	–	3×4m
7	Portable Spatial Reality Display	3×3m	3x3m
8	Physical Models (Services)	10×8m	7.5×7m
9	Instruments (Argo/Glider/Wave Rider/Mooring)	7×7m	3.3 sqm
10	Video Wall / Data Wall	–	7.2×2.025m
11	Auditorium / Classroom	Variable	–
12	Reception / Ticketing	4×2m	4×2m
13	Digital Signage & Wayfinding	Throughout	Throughout
14	Spherical Display	–	–
15	Digital Display Panels (12)	Throughout	–
16	Humanoid Robots	–	–

Annexure -5

BID-SECURING DECLARATION FORM

Bid No. INCOIS: PUR:49/2025 date 05.01.2026 "**Turnkey Design, Development, Supply, Installation, Testing, Commissioning and Integration of Immersive Experience Centre at INCOISandGPBAASRI - Comprehensive Package Including VR/AR/Holographic Solutions, Custom Scientific Content Development, Museum-Grade Interior, MEP Works, Technical Infrastructure and 3-Year Warranty & 2-year AMC.**"

To

The Director
Indian National Centre for Ocean Information Services (INCOIS),
Ministry of Earth Sciences, Govt. of India,
"Ocean Valley", Pragathi Nagar (BO),
Nizampet (SO), Hyderabad - 500 090,

I/We the undersigned, declare that: I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any tender/contract with INCOIS for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, i.e., if I/We withdraw, modify, amend, impair or derogate from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or having been notified of the acceptance of our Bid by the purchaser during the period of bid validity (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Dated on _____ day of _____

Signature of the Tenderer/Authorized Signatory & date

Name of the authorized signatory:

OFFICE SEAL,

Designation:

Name of the Bidder:

Address:

(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid)

Annexure -6

BANKGUARANTEEFORMATFORBIDSECURITY:

Whereas……..(Hereinafter called "the Bidder") has submitted its bid dt…….. (Date of submission of bid) for the supply of ……..(nameand/ordescriptionofthegoods)(hereinaftercalled"theBid").

KNOW ALL PEOPLE by these presents that WE …….(name of bank) of …….(name of country), having our registered office at ……..(address of bank) (hereinafter called "the Bank"), are bound unto……(name of Purchaser) (hereinafter called "the Purchaser") in the sum of _____for which payment well andtruly tobemade tothesaid Purchaser, theBankbindsitself,itssuccessors,andassignsbythesepresents. Sealed withthe CommonSealofthesaidBankthis_____dayof__20_____.

THECONDITIONSofthisobligationare:

1. IftheBidderWithdrawsitsBidduringtheperiodofbidvalidityspecifiedbytheBidderonthe BidForm;or

2. IftheBidder,havingbeennotifiedoftheacceptanceofitsbidbythePurchaserduringtheperiodofbidvalidity:

   (a) failsorrefusestoexecutetheContractFormifrequired;or

   (b) fails orrefuses tofurnish theperformance security, inaccordance withtheinstructiontoBidders.

Weundertake topaythePurchaser uptotheaboveamountuponreceiptofitsfirstwritten demand,withoutthePurchaserhavingtosubstantiateitsdemand,providedthatinitsdemand thePurchaserwillnotethattheamountclaimedbyitisduetoit,owingtotheoccurrenceofone orbothofthetwoconditions,specifyingtheoccurredconditionorconditions.

Thisguaranteeshallremaininforceupto_____fromthedateofsubmissionofthebidand anydemandinrespectthereofshouldreachtheBanknotlaterthantheabovedate.

(SignatureoftheBank)

NameoftheBidder

Annexure 7

PRE-CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement(hereinafter calledthe Integrity Pact) ismade on ……. day of the ……..month of 2026, between,on one hand, the President of India/ Director INCOIS acting through **Shri …….** , Ministry/Department, Government of India (herein after called the "**BUYER**", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and **……. represented by Mr. ……..…….. Designation ……..**(herein after called the "**BIDDER/Seller**" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part. WHEREAS the BUYER proposes to procure **"Turnkey Design, Development, Supply, Installation, Testing, Commissioning and Integration of Immersive Experience Centre at INCOIS and GPBAASRI– Comprehensive Package Including VR/AR/Holographic Solutions, Custom Scientific Content Development, Museum-Grade Interior, MEP Works, Technical Infrastructure and 3-Year Warranty &2-year AMC**."andtheBIDDER/ Seller is willing to offer /has offered the stores and

WHEREAS the BIDDER is a private company / public company / Government undertaking /partnership /registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry /Department of the Government of India /PSU performing its functions on behalf of the President of India.

NOW, THERFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence /prejudiced dealings prior to, during and subsequent tothe currency of the contract to be entered in towith a view to:-

Enabling the BUYER to obtain the desired said stores /equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that he or competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter intothis Integrity Pact and agree as follows:-

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The BUYER will, during the pre-contract stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER comparison to other BIDDERs.

1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2 In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERs

3 The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-

contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

3.1 The BIDDER will not offer, directly or through intermediaries any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show disfavour to any person in relation to the contract or any other contract with the Government.

3.3* BIDDERs shall disclose the name and addresses of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4* BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5* The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/Integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of the services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender. The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

3.14 The bidder shall not commit any offence under Indian Penal code/Prevention of Corruption Act.

3.15 A person signing IP shall not approach the courts while representing the matters to IEMs and he/she will await their decision in the matter.

3.16 In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of sub-contracting, thePrincipal contractor. It is to be ensured that all sub contractors also sign the IP.

4. Previous Transgression

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this integrity pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India could justify BIDDERs exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit)

5.1 While submitting commercial bid, the BIDDER shall deposit an amount(to be specified in Tender) as Earnest Money/Security Deposit, with the BUYER through any of the following instruments.

(i) Bank Draft or a Pay Order in favour of ___

(ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reason whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in the Tender) NEFT/RTGS/Wire Transfer

5.2 The Earnest Money / Security Deposit shall be valid upto9 months or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase contract that the provision of Sanctions for violations shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money / Security Deposit for the period of its currency.

6. Sanctions for Violations.

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediatelycancelthecontract, ifalreadysigned, withoutgiving any compensation to the BIDDER

(iv) To recover all sums already paid by the BUYER and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with the interest.

(vi) To cancel all or any other contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money (s) due to the BIDDER.

(vii) To debartheBIDDERfrom participatinginfuturebidding processof the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeiture the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code,

1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption

6.3 The decision of the BUYER to the effect that a breach of the provisions of this pact has been committed by theBIDDERshallbe finalandconclusiveon the BIDDER. However, the BIDDER can approach the independent Monitor (s) appointed for the purposes of this pact.

7 Fall Clause

7.1 The BIDDER undertakes that it has not supplied / is not supplying similar product / systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry / Department of the Government of India or PSU and if it is found at any stage that similar product / systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India, or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. Independent Monitors

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission
Independent External Monitors (IEMs):

Shri Ajay Kumar Lal, IRSO, HIG, Block 3A/101 A, Motia Khan (Near Jhandewalan Temple), D.B. Gupta Road, New Delhi-110015	Shri Pavan Kumar Jain, DG (MES), A-402, Shree Ganesh Apartments, Plot No. 12B, Sector-7 Dwarka, New Delhi-110075
(Email:ajay_k_lal@yahoo.com,	(Email :mespkj@gmail.com,

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extend the parties comply with the obligations under this pact.

8.3 The monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project / procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor Sufficient information about all meetings amount the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitorwillsubmita writtenreporttothe designatedAuthority of BUYER/Secretary in the Department /within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination

10. Law and Place of Jurisdiction

This pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other legal Actions.

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this integrity pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including, warrant period, whichever is later. In case BIDDER is unsuccessful, this integrity pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this pact turn out to be invalid; the remainder of this pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. Parties hereby sign this Integrity Pact at on__

BUYER	BIDDER
Name of the Officer	CHIEF EXECUTIVE OFFICER Designation
Dept./Ministry/PSU	
Witness:	Witness:
1._____	1._____
2._____	2._____

*Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.