इंकॉइस

INCOIS

भारतीय राष्ट्रीय महासागर सूचना सेवा केंद्र
पृथ्वी विज्ञान मंत्रालय, भारत सरकार
"ओशियन वैली", प्रगति नगर (बी.ओ), निज़ामपेट (एस. ओ), हैदराबाद - 500 090
दूरभाष सं. 040-2388 6002 / 23886074 फैक्स : 040-2389 2910 / 2389 5001
INDIAN NATIONAL CENTRE FOR OCEAN INFORMATION SERVICES
Ministry of Earth Sciences, Government of India
"Ocean Valley", Pragathi Nagar (BO), Nizampet (SO), Hyderabad - 500 090
Phone No.040-2388 6002/23886074 Fax: 040-2389 2910/2389 5001

इंकॉइस:क्रय:49/2025 दिनांक: 20.02.2026
Ref. INCOIS: PUR: 49/2025 Date: 20. 02. 2026

सरकारी ई बाज़ार द्वारा निविदा सूचना आमंत्रण
Notice Inviting Tender through Government E Market Place (GeM)

भारतीय राष्ट्रीय महासागर सूचना सेवा केंद्र, हैदराबाद भारत सरकार के पृथ्वी विज्ञान मंत्रालय के अंतर्गत एक स्वायत्त निकाय है।
Indian National Centre for Ocean Information Services (INCOIS), Hyderabad is an autonomous body under Ministry of Earth Sciences, Government of India.

निम्न विवरणों के लिए पंजीकृत विक्रेताओं से निविदाओं/बोलियों को आमंत्रित किया जाता है। जीईएम की एक अधिप्राप्ति होने के नाते बोलियों को केवल सरकारी ई बाज़ार (जीईएम) http://gem.gov.in/ द्वारा ऑनलाइन से ही जमा किया जाए। एनआईटी का संक्षिप्त विवरण नीचे दिया जा रहा है।
Tenders/Bids are invited from registered vendors of GeM for the following items. Being a GeM procurement, the bids has to be submitted online through Government E- Market Place (GeM) http://gem.gov.in/ only. The brief details of NIT are appended below.

क्र.सं SNo.	कार्य का नाम Name of the Work	बोली संदर्भ सं. Bid Reference No.	बोली संख्या एवं दिनांक Bid Number and Date	बोली समाप्ति की तारीख और समय Bid end date and Time
	इंकॉइस और जीपीबीएएसआरआई में इमर्सिव एक्सपीरियंस सेंटर का टर्नकी डिज़ाइन, विकास, आपूर्ति, स्थापना, परीक्षण, कमीशनिंग और एकीकरण - व्यापक पैकेज, जिसमें वीआर/एआर/होलोग्राफिक समाधान, कस्टम वैज्ञानिक सामग्री विकास, म्यूज़ियम-ग्रेड इंटीरियर, एमईपी कार्य, तकनीकी इंफ्रास्ट्रक्चर और 3 साल की वारंटी शामिल है 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	इंकॉइस:क्रय: 49/2025 INCOIS:PUR: 49/2025	जीईएम/2026/बी/7266334 दिनांक:20.02.2026 GEM/2026/B/7266334 dated 20.02.2026	20.03.2026 15:00:00

जीईएम की एक अधिप्राप्ति होने के नाते बोलियों को केवल जीईएम पोर्टल अर्थात बोली/आरए के खाने के अंतर्गत http://gem.gov.in/ द्वारा ऑनलाइन से ही जमा किया जाए। किसी भी प्रकार की सहायता के लिए कृपया जीईएम पोर्टल की हेल्प लाइन से संपर्क करें। निम्न अधिकारियों से भी संपर्क किया जा सकता है: श्री वी सुब्रह्मण्यम (ईमेल: manyam@incois.gov.in; दूरभाष सं. 040 2388 6022)/ श्री श्री दसारी प्रसाद (ईमेल: dasariprasad@incois.gov.in दूरभाष सं 040-2388 6082)

Being a GeM procurement, the bid has to be submitted online through the GeM portal i.e., http://gem.gov.in under the Bids/RAs column. For any assistance, please contact help line of GeM portal. The following officials may also be contacted: Mr. V. Subrahmanyam (email: manyam@incois.gov.in; Phone No. 040 2388 6022)/Mr. Dasari Prasad (email: dasariprasad@incois.gov.in Phone No. 040-2388 6082).

(V. Subrahmanyam)
(प्रशासनिक अधिकारी (क्रय)/ Administrative Officer (Purchase)
निविदा आमंत्रण प्राधिकारी, इंकॉइस/Tender Inviting Authority, INCOIS

नोडल अधिकारी / Nodal Officer
एनआईटी / NIT GEM/2026/B/7266334
ई-क्रय / e-Procurement 20.02.2026

बिड संख्या/Bid Number: GEM/2026/B/7266334
दिनांक /Dated: 20-02-2026

बिड दस्तावेज़ / Bid Document

बिड विवरण/Bid Details	
बिड बंद होने की तारीख/समय /Bid End Date/Time	20-03-2026 15:00:00
बिड खुलने की तारीख/समय /Bid Opening Date/Time	20-03-2026 15:30:00
बिड पेशकश वैधता (बंद होने की तारीख से)/Bid Offer Validity (From End Date)	90 (Days)
मंत्रालय/राज्य का नाम/Ministry/State Name	Ministry Of Earth Sciences
विभाग का नाम/Department Name	Department Of Earth Sciences
संगठन का नाम/Organisation Name	Earth Sciences Secretariate
कार्यालय का नाम/Office Name	Indian National Centre For Ocean Information Servi
कुल मात्रा/Total Quantity	49
वस्तु श्रेणी /Item Category	VR Headset 1 , VR Headset 2 , VR Laptop 3 , VR Visualization 4 , Reality Devices 5 , Holographic Display 6 , Holographic Display 7 , Magic Book 8 , Table 9 , projection room 10 , Immersive expence 11 , AR VR Content 12 , Any other 13 , Interior Works 14
GeMARPTS में खोजी गई स्ट्रिंग्स / Searched Strings used in GeMARPTS	AR VR Hologram
GeMARPTS में खोजा गया परिणाम / Searched Result generated in GeMARPTS	Virtual Reality Headset, Yttrium Oxide AR, Ammonium acetate AR Grade, N - Hexane AR Grade, Cupferron, Kalignost / Sodium Tetraphenylborate, 2-2-BIPYRIDYL, ACETYLE ACETONE, Zinc Metal Dust, Sodium fluoride, Extra Pure and AR/ACS
अधिसूचना के लिए चयनित प्रासंगिक श्रेणियाँ / Relevant Categories selected for notification	• Virtual Reality Headset
बीओक्यू शीर्षक /BOQ Title	SITC of AR VR HOLOGRAM
बिडर का न्यूनतम औसत वार्षिक टर्नओवर (3 वर्षों का) /Minimum Average Annual Turnover of the bidder (For 3 Years)	355 Lakh (s)
उन्हीं/समान सेवा के लिए अपेक्षित विगत अनुभव के वर्ष/Years of Past Experience Required for same/similar service	3 Year (s)
टर्नओवर के लिए एमएसई को छूट प्राप्त है / MSE Relaxation for Turnover	Yes | Partial | Turn over value - 355 (in lakhs)

बिड विवरण/Bid Details	
टर्नओवर के लिए स्टार्टअप को छूट प्राप्त है / Startup Relaxation for Turnover	Yes | Partial | Turn over value - 355 (in lakhs)
विक्रेता से मांगे गए दस्तावेज़/Document required from seller	Experience Criteria,Bidder Turnover,Certificate (Requested in ATC),OEM Authorization Certificate,Additional Doc 1 (Requested in ATC),Compliance of BoQ specification and supporting document *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
क्या आप निविदाकारों द्वारा अपलोड किए गए दस्तावेज़ों को निविदा में भाग लेने वाले सभी निविदाकारों को दिखाना चाहते हैं? संदर्भ मेनू है/Do you want to show documents uploaded by bidders to all bidders participated in bid?	Yes (Documents submitted as part of a clarification or representation during the tender/bid process will also be displayed to other participated bidders after log in)
बिड लगाने की समय सीमा स्वतः नहीं बढ़ाने के लिए आवश्यक बिड की संख्या। / Minimum number of bids required to disable automatic bid extension	3
दिनों की संख्या, जिनके लिए बिड लगाने की समय-सीमा बढ़ाई जाएगी। / Number of days for which Bid would be auto-extended	7
ऑटो एक्सटेंशन अधिकतम कितनी बार किया जाना है। / Number of Auto Extension count	1
बिड से रिवर्स नीलामी सक्रिय किया/Bid to RA enabled	Yes
रिवर्स नीलामी योग्यता नियम/RA Qualification Rule	H1-Highest Priced Bid Elimination
बिड का प्रकार/Type of Bid	Two Packet Bid
प्राथमिक उत्पाद श्रेणी/Primary product category	VR Headset 1
तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय /Time allowed for Technical Clarifications during technical evaluation	3 Days
निरीक्षण आवश्यक (सूचीबद्ध निरीक्षण प्राधिकरण /जेम के साथ पूर्व पंजीकृत एजेंसियों द्वारा)/Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)	No
मूल्यांकन पद्धति/Evaluation Method	Total value wise evaluation
वित्तीय दस्तावेज की आवश्यकता है / Financial Document Required	Yes
मध्यस्थता खंड/Arbitration Clause	Yes (Arbitration clause document) as per DoE OM No.F.1/2/2024-PPD dated 03.06.2024 Arbitration should not be routinely included in contracts

बिड विवरण/Bid Details	
सुलह खंड/Mediation Clause	Yes (Mediation clause document) as per DoE OM No.F.1/2/2024-PPD dated 03.06.2024 mediation clause should not be routinely included in contracts and pre-litigation mediation can be taken up without any such clause also

ईएमडी विवरण/EMD Detail

एडवाईजरी बैंक/Advisory Bank	State Bank of India
ईएमडी राशि/EMD Amount	1424000

ईपीबीजी विवरण /ePBG Detail

एडवाइजरी बैंक/Advisory Bank	State Bank of India
ईपीबीजी प्रतिशत (%)/ePBG Percentage(%)	5.00
ईपीबीजी की आवश्यक अवधि (माह) /Duration of ePBG required (Months).	38

(a). जेम की शर्तों के अनुसार ईएमडी छूट के इच्छुक बिडर को संबंधित केटेगरी के लिए बिड के साथ वैध समर्थित दस्तावेज़ प्रस्तुत करने है। एमएसई केटेगरी के अंतर्गत केवल वस्तुओं के लिए विनिर्माता तथा सेवाओं के लिए सेवा प्रदाता ईएमडी से छूट के पात्र हैं। व्यापारियों को इस नीति के दायरे से बाहर रखा गया है।/EMD EXEMPTION: The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per GeM GTC with the bid. Under MSE category, only manufacturers for goods and Service Providers for Services are eligible for exemption from EMD. Traders are excluded from the purview of this Policy.

(b).ईएमडी और संपादन जमानत राशि, जहां यह लागू होती है, लाभार्थी के पक्ष में होनी चाहिए। / EMD & Performance securityshould be in favour of Beneficiary, wherever it is applicable.

लाभार्थी /Beneficiary :
Director INCOIS
Payable at Hyderabad, Indian National Centre for Ocean Information Services, Ministry of Earth Sciences, Pragathi Nagar, Hyderabad -500090
(Director, Incois)

UIN Number NCTGC2415P

बोली विभाजन लागू नहीं किया गया/ Bid splitting not applied.

एमआईआई खरीद वरीयता / MII Purchase Preference

एमआईआई खरीद वरीयता / MII Purchase Preference	Yes
मेक इन इंडिया विक्रेताओं को खरीद में प्राथमिकता, यदि उनका मूल्य L1+X% तक की सीमा में है / Purchase Preference to MII sellers availabele upto price within L1+X%	20

मेक इन इंडिया खरीद में प्राथमिकता के लिए बिड की मात्रा का अधिकतम प्रतिशत / Maximum Percentage of Bid quantity for MII purchase preference	50
सार्वजनिक खरीद (मेक-इन-इंडिया को प्राथमिकता) आदेश 2017 के अनुसार केवल क्लास 1/क्लास 2 के स्थानीय आपूर्तिकर्ताओं को ही भागीदारी की अनुमति है दिनांक 16.09.2020 (समय-समय पर संशोधित एवं लागू) / Allow participation only from Class 1/Class 2 local suppliers as per the Public procurement(Preference to Make-in-india) order 2017 date 16.09.2020(as amended and applicable time to time)	Yes, in compliance with the MII ORDER : DPIIT Order(as amended and applicable time to time)

एमएसई खरीद वरीयता/MSE Purchase Preference

एमएसई खरीद वरीयता/MSE Purchase Preference	Yes
सूक्ष्म और लघु उद्यम मूल उपकरण निर्माताओं को खरीद में प्राथमिकता, यदि उनका मूल्य L1+X% तक की सीमा में हो / Purchase Preference to MSE OEMs available upto price within L1+X%	15
सूक्ष्म और लघु उद्यम को खरीद में प्राथमिकता के लिए बिड की मात्रा का अधिकतम प्रतिशत / Maximum Percentage of Bid quantity for MSE purchase preference	25

1. If the bidder is a Micro or Small Enterprise (MSE) as per latest orders issued by Ministry of MSME, the bidder shall be relaxed from the eligibility criteria of "Bidder Turnover" as defined above subject to meeting of quality and technical specifications. If the bidder itself is MSE OEM of the offered products, it would be relaxed from the "OEM Average Turnover" criteria also subject to meeting of quality and technical specifications. The bidder seeking Relaxation from Turnover, shall upload the supporting documents to prove his eligibility for Relaxation.
2. If the bidder is a DPIIT registered Startup, the bidder shall be relaxed from the the eligibility criteria of "Bidder Turnover" as defined above subject to their meeting of quality and technical specifications. If the bidder is DPIIT Registered OEM of the offered products, it would be relaxed from the "OEM Average Turnover" criteria also subject to meeting of quality and technical specifications. The bidder seeking Relaxation from Turnover shall upload the supporting documents to prove his eligibility for Relaxation.
3. The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of the previous financial year, should be as indicated above in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3-year-old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.
4. Experience Criteria: In respect of the filter applied for experience criteria, the Bidder or its OEM of the product offered in the bid {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU for number of Financial years as indicated above in the bid document before the bid opening date. Copies of relevant contracts and delivery acceptance certificates like CRAC to be submitted along with bid in support of having supplied some quantity during each of the Financial year. In case of bunch bids, the category of primary product having highest value should meet this criterion.
5. Preference to Make In India products (For bids < 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local

content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .The buyers are advised to refer the OM No.F.1/4/2021-PPD dated 18.05.2023.
OM_No.1_4_2021_PPD_dated_18.05.2023 for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

6. Purchase preference will be given to MSEs having valid Udyam Registration and whose credentials are validated online through Udyam Registration portal as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail themselves of the Purchase preference, the bidder must be the manufacturer / OEM of the offered product on GeM. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises and hence resellers offering products manufactured by some other OEM are not eligible for any purchase preference. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service and Buyer will decide eligibility for purchase preference based on documentary evidence submitted, while evaluating the bid. If L-1 is not an MSE and MSE Seller (s) has / have quoted price within L-1+ 15% (Selected by Buyer) of margin of purchase preference /price band defined in relevant policy, such MSE Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total quantity. The buyers are advised to refer the OM No. F.1/4/2021-PPD dated 18.05.2023 OM_No.1_4_2021_PPD_dated_18.05.2023 for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017. Benefits of MSE will be allowed only if seller is validated on-line in GeM profile as well as validated and approved by Buyer after evaluation of documents submitted.
7. Estimated Bid Value indicated above is being declared solely for the purpose of guidance on EMD amount and for determining the Eligibility Criteria related to Turn Over, Past Performance and Project / Past Experience etc. This has no relevance or bearing on the price to be quoted by the bidders and is also not going to have any impact on bid participation. Also this is not going to be used as a criteria in determining reasonableness of quoted prices which would be determined by the buyer based on its own assessment of reasonableness and based on competitive prices received in Bid / RA process.

8. Reverse Auction would be conducted amongst all the technically qualified bidders except the Highest quoting bidder. The technically qualified Highest Quoting bidder will not be allowed to participate in RA. However, H-1 will also be allowed to participate in RA in following cases:

i. If number of technically qualified bidders are only 2 or 3.
ii. If Buyer has chosen to split the bid amongst N sellers, and H1 bid is coming within N.
iii. In case Primary product of only one OEM is left in contention for participation in RA on elimination of H-1.
iv. If L-1 is non-MSE and H-1 is eligible MSE and H-1 price is coming within price band of 15% of Non-MSE L-1
v. If L-1 is non-MII and H-1 is eligible MII and H-1 price is coming within price band of 20% of Non-MII L-1

एक्सेल में अपलोड किए जाने की आवश्यकता /Excel Upload Required :

PRICEBID - 1771566390.xlsx

Pre Bid Detail(s)

मूल्य भिन्नता खंड दस्तावेज़/Pre-Bid Date and Time	प्री-बिड स्थान/Pre-Bid Venue
02-03-2026 15:00:00	at INCOIS, Hyderabad (Hybrid Mode) Site Visit at 10:00 Hrs on same day

VR Headset 1

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

तकनीकी विशिष्टियाँ /Technical Specifications

Specification Document	View File
BOQ Detail Document	View File

Advisory-Please refer attached BOQ document for detailed consignee list and delivery period.

परेषिती/रिपोर्टिंग अधिकारी तथा मात्रा/Consignees/Reporting Officer and Quantity

क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	24	120

VR Headset 2

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

तकनीकी विशिष्टियाँ /Technical Specifications

Specification Document	View File
BOQ Detail Document	View File

Advisory-Please refer attached BOQ document for detailed consignee list and delivery period.

परेषिती/रिपोर्टिंग अधिकारी तथा मात्रा/Consignees/Reporting Officer and Quantity

क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days

क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	6	120

VR Laptop 3

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	4	120

VR Visualization 4

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	2	120

Reality Devices 5

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

तकनीकी विशिष्टियाँ /Technical Specifications

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क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	3	120

Holographic Display 6

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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1	Reddipalli Velangini Giridhar	500090,Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India, Ocean valley, Pragathi Nagar BO, Nizampet SO, Hyderabad - 50090 INDIA	2	120

Holographic Display 7

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Magic Book 8

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Table 9

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Projection Room 10

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Immersive Expence 11

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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AR VR Content 12

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Any Other 13

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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Interior Works 14

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

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क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें/Buyer Added Bid Specific Terms and Conditions

1. **Generic**

   OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. The purchaser also reserves the right to increase the ordered quantity up to 25% of the contracted quantity during the currency of the contract at the contracted rates. The delivery period of quantity shall commence from the last date of original delivery order and in cases where option clause is exercised during the extended delivery period the additional time shall commence from the last date of extended delivery period. The additional delivery time shall be (Increased quantity ÷ Original quantity) × Original delivery period (in days), subject to minimum of 30 days. If the original delivery period is less than 30 days, the additional time equals the original delivery period. The Purchaser may extend this calculated delivery duration up to the original delivery period while exercising the option clause. Bidders must comply with these terms.

2. **Service & Support**

   Dedicated /toll Free Telephone No. for Service Support : BIDDER/OEM must have Dedicated/toll Free Telephone No. for Service Support.

3. **Service & Support**

   Escalation Matrix For Service Support : Bidder/OEM must provide Escalation Matrix of Telephone Numbers for Service Support.

4. **Buyer Added Bid Specific ATC**

   Buyer Added text based ATC clauses

   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.

   1. Payment terms:

All payments shall be made against verified deliverables and certification by INCOIS. No advance payments shall be made.

The quoted prices shall be all-inclusive. Taxes and duties shall be payable as per applicable law.

Percentages mentioned below are applied to the **Total Contract Value (TCV)**.

Milestone No.	**Milestone Description**	**Payment %**
1	Completion of all the phases below and acceptance of the solution **DesignApproval**: Submission of design and INCOIS approval of: (a) master architectural and interior layouts, zoning and visitor-flow plans; (b) coordinated MEP concept drawings; as required under Sections 3, 4 and 5. **Delivery of Equipment and Interior Materials**: **Physical delivery** at INCOIS (and GPBAASRI, wherever applicable) of all the immersive devices, supporting systems and interior fit-out materials, as per approved BoM, and verification by INCOIS (Delivery Challans / CRAC). **Custom Scientific Content Design &Development – Acceptance** **Preparation of content storyboards / flow diagrams** for all 5 INCOIS services in collaboration with INCOIS and approval from INCOIS. Completion of **all custom 2D/3D/VR/AR/holographic content** for the 5 services, demonstrated on the devices. Acceptance shall be based on agreed storyboards, scientific correctness and functional/acceptance test procedures as listed in Section 3.3.6. **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. **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.	90% of TCV

2	**Balance payment**	**Retention / Warranty Holdback**: 10%TCV will be released after of 3-year warranty period (or) will be released earlier against submission of equivalent Bank Guarantee valid for the warranty duration with a 60 day claim period.

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.

Net payment will be released after statutory deductions.

Completion Period: Within four months from the date of approval. Details of delivery timeline are specified in 3.4.1.

Site visit and Pre-Bid Meeting : On March 2, 2026,

at 1000 hrs. - Site Visit and

1500 hrs. - Pre bid meeting (Hybrid mode

)

Buyer Added Bid Specific ATC 5.

Buyer uploaded ATC document Click here to view the file.

अस्वीकरण/Disclaimer

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. If any clause(s) is / are incorporated by the Buyer regarding following, the bid and resultant contracts shall be treated as null and void and such bids may be cancelled by GeM at any stage of bidding process without any notice:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to exemption provided to such sellers under GeM GTC.
3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.

7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process. (However, in bids for attached categories, trials are allowed as per approved procurement policy of the buyer nodal Ministries)
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.
15. Buyer added ATC Clauses which are in contravention of clauses defined by buyer in system generated bid template as indicated above in the Bid Details section, EMD Detail, ePBG Detail and MII and MSE Purchase Preference sections of the bid, unless otherwise allowed by GeM GTC.
16. In a category based bid, adding additional items, through buyer added additional scope of work/ additional terms and conditions/or any other document. If buyer needs more items along with the main item, the same must be added through bunching category based items or by bunching custom catalogs or bunching a BoQ with the main category based item, the same must not be done through ATC or Scope of Work.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

All GeM Sellers/Service Providers shall ensure full compliance with all applicable labour laws, including the provisions, rules, schemes and guidelines under the four Labour Codes i.e. the Code on Wages, 2019; the Industrial Relations Code, 2020; the Occupational Safety, Health and Working Conditions Code, 2020; and the Code on Social Security, 2020 as and when notified and brought into force by the Government of India.

For all provisions of the Labour Codes that are pending operationalisation through rules, schemes or notifications, the corresponding provisions of the pre-existing labour enactments (such as The Minimum Wages Act, 1948, The Payment of Wages Act, 1936, The Payment of Bonus Act, 1965, The Equal Remuneration Act, 1976, The Payment of Gratuity Act, 1972, etc. and relevant State Rules) shall continue to remain applicable.

The Seller/ Service Providers shall, therefore, be responsible for ensuring compliance under:

- **All notified and enforceable provisions of the new Labour Codes as mentioned hereinabove; and**
- **All operative provisions of the erstwhile Labour Laws until their complete substitution.**

All obligations relating to wages, social security, safety, working conditions, industrial relations etc. and any other statutory requirements shall be strictly met by the Seller/ Service Provider. Any non-compliance shall constitute a breach of the contract and shall entitle the Buyer to take appropriate action in accordance with the contract and applicable law.

यह बिड सामान्य शर्तों के अंतर्गत भी शासित है /This Bid is also governed by the General Terms and Conditions

जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो।बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।/In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.

---धन्यवाद/Thank You---

INCOIS:PUR:49/2025 February 20, 2026

Request for Proposal 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"

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 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.	**Earnest Money Deposit (EMD)**	Rs.14,24,000/- (Rupees Fourteen lakhs and twenty-four thousand only).
3.	**Completion period**	Within four months from the date of approval. Details of delivery timeline are specified in 3.4.1
4.	**Due date for seeking clarification**	1500 Hrs.of February27, 2026
5.	**Site Visit and Pre bid meeting date (same day)**	On March 2, 2026, at 1000 hrs. – Site Visit and 1500 hrs. – Pre bid meeting (Hybrid mode)
6.	**Due date for bid submission**	1500 Hrs. of March 20, 2026
7.	**Bid opening date**	1530 Hrs. of March 20, 2026

Being a GeM procurement, the bid must be submitted online through the GeM portal, i.e., 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).
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.

INCOIS may, at its discretion, extend the deadline for submission of bids by issuing a corrigendum, in which case all rights and obligations of the owner and the bidders previously subject to the original deadline will there after be subject to the deadline as extended.

Postal & Delivery Address	**Location**
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 Ph. No.040-23886000	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

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1. Introduction

The Indian National Centre for Ocean Information Services (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 GPBAASRI internal 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 the specified timeline as detailed in the 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 set up at INCOIS and at GPBAASRI Science Museum.

2.3 The successful 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.

For the INCOIS experience center, the successful 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 successful 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 successful bidder 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 successful bidder shall design and develop customized contentin close collaboration with INCOIS team to ensure its scientific integrity as per the requirements specified in the Content Specifications section.Sample scripts describing high-level details of the required services are attached in Annexure-I. Bidder is required to design and develop the appropriate storyboards from this starting point.

2.7 The content should be created for 10 languages namely English, Hindi, Telugu, Tamil, Malayalam, Marathi, Kannada, Gujarati, Odia, and Bengali. These language options need to be provided for voice-over, subtitles, narration, UI panels etc.

2.8 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.

2.9 Interior works – summary (detailed scope in Section 4)
For the INCOIS's Atal Bhavan (ITCOOcean), the successfulbidder 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 successfulbidder 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 successful 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.

Thesuccessful bidder will provide a "Site Requirement Document" within 2 weeks of PO outlining all needs at GPBAASRI (power supply specs, HVAC conditions, room prep like darkening or mounts, network points, etc.). GPBAASRI (the end-user site) is responsible for implementing infrastructure preparations. Any delays solely due to site not being ready (per the bidder's provided requirements) will not be held against the bidder when calculating the 4-month completion timeline. (In short, no interior build at GPBAASRI is in this scope – the bidder must just specify requirements and provide interface drawings. The timeline clock for those deliverables excludes client-side delays.)

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.

2.10 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.

2.11 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).

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

2.13 The Brand names are specified for reference only. Equivalent or Superior make/models will be accepted if they meet the mandatory specifications and are covered by Warranty. No Single OEM restriction applies.

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.
- The references provided in the technical specifications table below are for illustration and better understanding only. The bidder is not limited to these references only and no single OEM restriction applies.
- 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 by bidder>**	
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 head strap: 165 x 84 x 62 mm or higher, With head strap: 234 mm x 193 mm x 173 mm or higher	

Weight	500g with head strap	
Connections	At least 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	
Pass through	Depth-correct colour pass through	
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 head strap: 165 x 84 x 62 mm or higher, With head strap: 234 x 193 x 173 mm or higher	
Weight	700g with head strap or higher	
Connections	At least one USB 3.2 Type C port, at least 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 colour 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. At least two USB streaming cable for PC based VR display. At least 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)

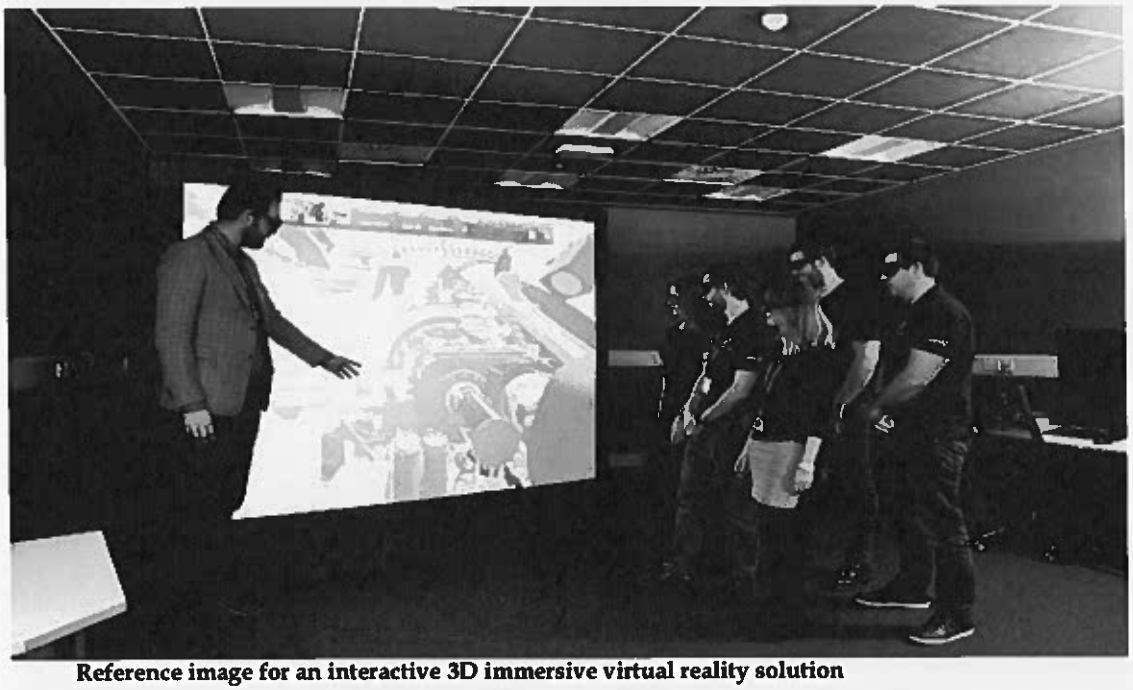
VR Supporting Laptop	**Make and Model: <To be Filled by bidder>**	
Parameter	**Min. Specifications**	**Compliance (Yes/ No)**
Processor	Intel Core i7 14th Gen equivalent or better	
Motherboard	OEM motherboard	
Memory	Min 16 GB DDR4 RAM	

Graphics	NVidia GeForce 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	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 touch screen	
	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/Technology	DLP Digital projection without using any Colour Wheel or Phosphor Wheel inside the projector to generate colours.	
Brightness	More than (>) 6000 ANSI Lumens	
Brightness Uniformity	> 90%	
Light source lifetime	50000 hrs or more (while running in full power mode)	
3D Support	Active Stereoscopic 3D and Passive Stereo compatible with polarized filters (not inclusive)	
Input source resolution & Refresh rate	Projector should be able to support input sources up to 4096 x 2160 @ 120Hz or more	
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 successful bidder 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 3D Glasses	RF-synced	

Sync		
Active Glasses Tracking range	Up to 10 metres or more	
Active Glasses Battery Range	8 hours or more	
Number of glasses	Total 30 glasses may be supplied for each setup (25 for active use + 5 spares)	
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 successfulbidder shall supply, install & commission a suitably rated UPS as part of the Proposed VR Solution package for GPBAASRIsite. The bidder shall determine the UPS capacity based on the load of all equipment they are installing at GPBAASRI. The UPS must support at least 30 minutes of autonomy at full load, with a design load not exceeding ~80% of UPS rated capacity. The bidder should include a load calculation and propose a suitable UPS make/model. GPBAASRI will make available a power connection and floor space for installing the UPS and battery bank (e.g. a location near the gallery) and will handle necessary input cabling up to the UPS input. UPS shall include SMF batteries designed for extended backup life. (Thus, the UPS size is bidder-defined to cover their system for 30 min backup; the site will accommodate the UPS unit and provide mains feed.)	
Reference	Custom-built interactive 3D wall projection or M/s BARCO make or M/s Norxe make or Axiom Holographic Wall	
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.	

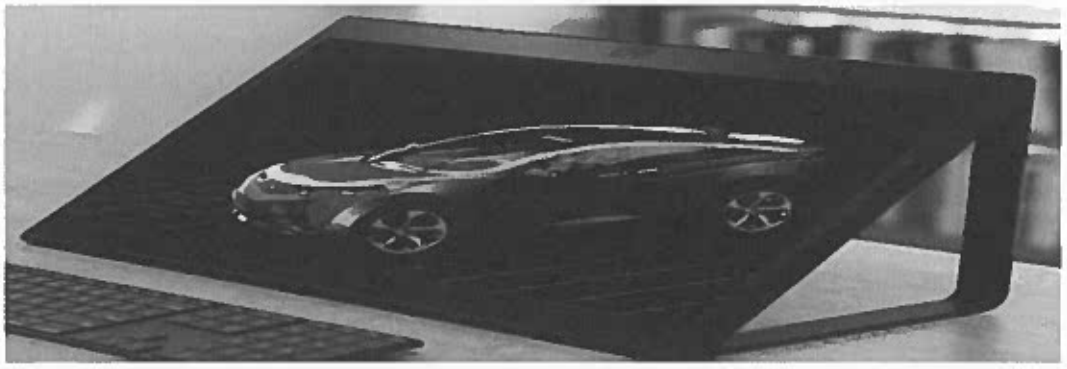


Reference image for an interactive 3D immersive virtual reality solution

3.1.5 Portable Spatial Reality Device with 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 billionColours (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, electrical equipmentneeds 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.	
Screen size	14" inch touch screen	

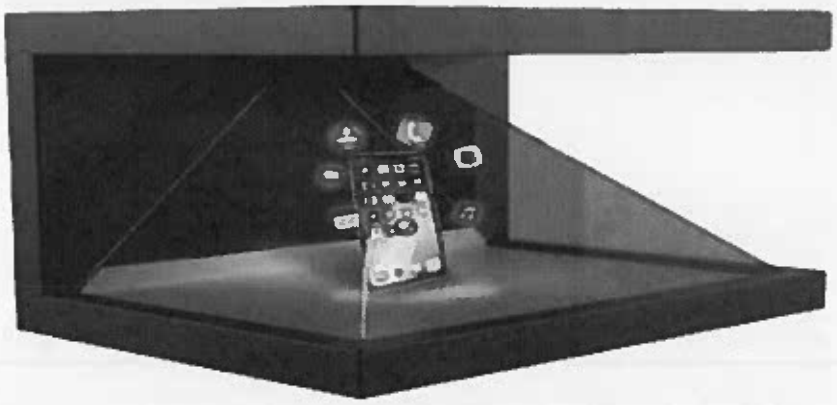


Reference image for spatial reality display

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	

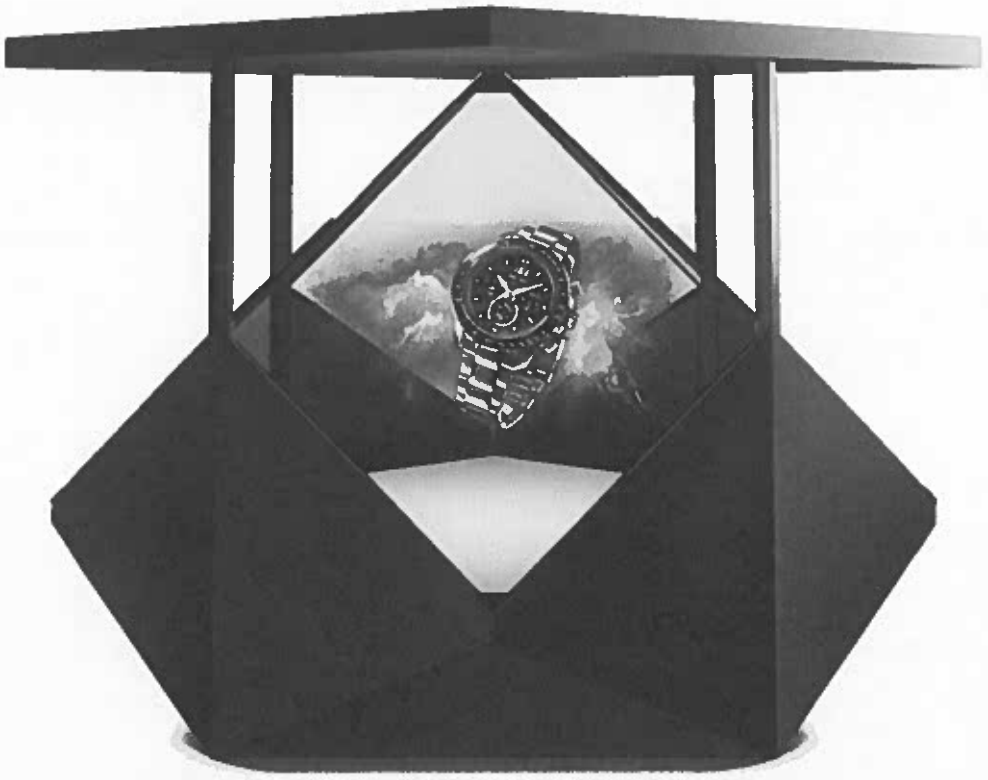


Reference image for a 3-Sided Pyramid Holographic Display

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	Any premium brand tablet (such as IPad, Samsung, Dell etc.) or a custom CMS solution.	
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 by bidder>**	
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 and 500 GB SSD	
Operating System	Windows 11 Pro	

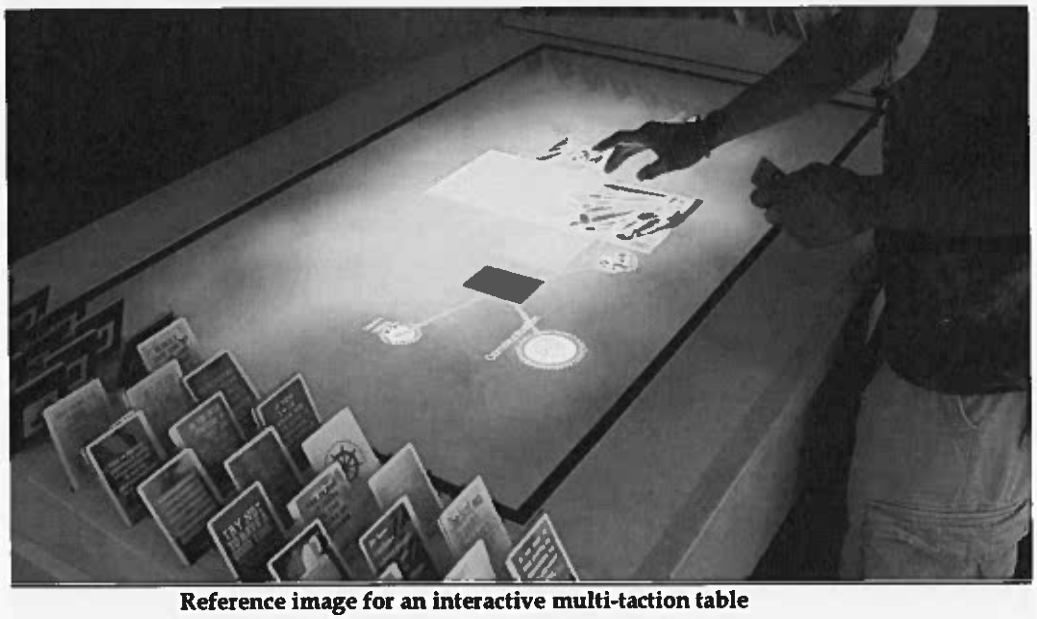
Reference image for a magic book display

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 colours	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

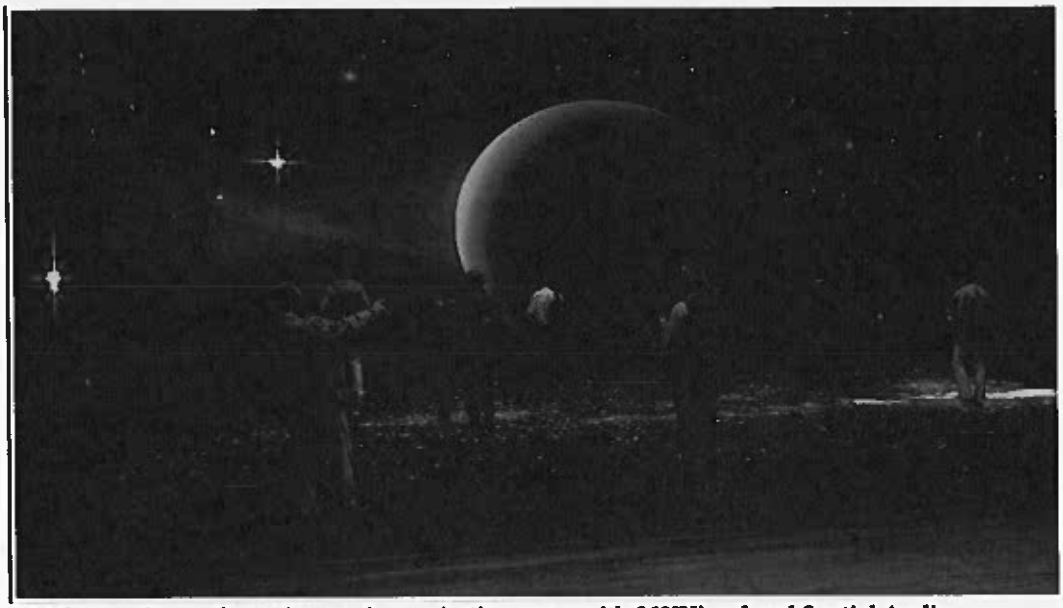
3.1.10 Immersive Projection Room With 360^{0}Visuals and Spatial Audio

Immersive 360-degree projection on 4 walls and the floor is required within a 20ft x 20ft room. Successful bidder 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 360^0 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	Minimum 6 projectors More number ofprojectors may also be proposed while meeting the required specificationsand keeping the cost in view.	
Brightness Uniformity	>90%	
Light source lifetime	Up to 30,000 hours or more	
Aspect Ratio	Native: 16:10 with support for 16:9 or better	
Full Field Contrast Ratio	1600:1 or more	
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 and Short Throw as suitable	
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 360⁰ 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. Open source/Disguise/Touch Designer etc. Custom stacks may also be used if it has any specific advantage after consulting with INCOIS team) 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. Successful bidder 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°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.

3.2. Content 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. INCOIS experts will review and provide approval/any additional inputs for accuracy of scientific phenomena .INCOIS will be able to provide relevant datasets if available with INCOIS. Otherwise, successful bidder may need to fetch it from outside sources.
- **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°Visual 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: Gesture-based Interactions:** Trigger warnings, open datasets, zoom into data layers
- CS-1.9: Contextual popups should be included for improving the understanding.

- **CS-1.10:** Spatial and ambient sound design should **enhance realism;** Voiceovers (Multi-language) should be clear and suitable for different age groups.
    - **Voice-based Narrator:** Explains Ocean phenomena, guided simulation
- **CS-1.11:** The following additional features may be included
    - Integration of AI elements like NLP & Generative AI based interaction/Q&A
    - 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 checkpoints/quizzesetc.
    - Historical events case studies .Historical event content is to be validated by INCOIS committee.
    - Impact assessment mode
    - **Data Visualizations:** Real-time or simulated forecast overlays
- **CS-1.11: Integration with tablet: Control Panel of the display on all hardware can also be made available through tablet 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:** Stock 3D assets could be utilized as appropriate.
- **TS-3.3.2.3:** Textures must be of high resolution (2K or better based on different device capabilities)
- **TS-3.3.2.4:** Multiple texture maps must be used to make the models more realistic like - Albedo, Normal, Metallic, Roughness, Occlusion, Height,etc.
- **TS-3.3.2.5:** 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 & UX 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.
- **TS-3.3.4.6:**Successful bidder may propose suitable branding guidelines (colors, typography, logo usage)
- **TS-3.3.4.7:** A simplified UI targeting different user groups as mentioned in CS-1.2 is preferred.
- **TS-3.3.4.8:**Museum grade wayfinding, accessibility readability standards to be followed.
- **TS-3.3.4.9:** UI panels can be multilingual and include 10 languages (namely English, Hindi, Telugu, Tamil, Malayalam, Kannada, Marathi, Gujarati, Odia, Bengali)
- **TS-3.3.4.10:**Content duration will be of two types: long version (3-4 minutes) and short version (1-2 minutes) that can target different environments (exhibitions/experience center) and different audience types (VIPs/Students)
- **TS-3.3.4.11:**Guided narration is preferable. Few suitable modules may include free exploration, if suitable. Successfulbidder to provide suitable content design during the storyboard preparation phase.
- **TS-3.3.4.12:**Group interaction may be provided for selected modules.
- **TS-3.3.4.13:** Roles may be defined based on the module (For e.g. Tsunami module may include INCOIS operator, Disaster management authority, and General Public roles). Suitable coordination (turn-based/event-driven) and appropriate prompts could be developed based on the storyboard created.

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 .Supporting version and modular updates is required for trackability
- **TS-3.3.5.5:**Updates are to be deployed on-site.
- **TS-3.3.5.6:**Application can also provide an option to integrate **live data** wherever possible, but it is not mandatory.

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 Multi Taction 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 360⁰ 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:**Successful bidder shall also demonstrate test cases for future content updates/integration, as applicable.
- TS-3.3.6.4: Acceptance Test document is to be provided with details of device wise test cases specified above and will be reviewed by INCOIS committee.

3.3.7 Security & Compliance

- **TS-3.3.7.1:**The core part of the immersive applications must operate **without any dependency on external internet connectivity** during run time.Additional features like LLM style Q&A etc. could be enabled through internal network/other forms of connectivity to a central server or a supporting system. As specified in Section 2, the scope of the work also extends to portable devices which may be placed in exhibitions/conferences where connectivity might be limited. So, the selected bidder must include details of such features in the content design phase and approval needs to be taken from INCOIS for implementing the same.
- **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. Encryption is not mandatory for offline data.
- **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:**Any relevant and trusted marketplace plugins can be built into the signed application. Source code of the plugin is preferable to be included.
- **TS-3.3.7.7:**Successful bidder s 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 successfulbidder mustsubmit a suitable design within 2 weeks from the date of awardfor INCOIS approval covering (a) master architectural and interior layouts, zoning and visitor-flow plans; (b) coordinated MEP concept drawings.
- Upon INCOIS approval of the design, the execution of the project needs to be completed within 4 months.

3.4.2 Installation

- The successfulbidder 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 successful 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 successful bidder shall provide detailed installation and configuration documentation, including version numbers, serial numbers, and system diagrams.

3.4.3 Training

- The successfulbidder 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 successfulbidder 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 successfulbidder 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.Perpetual license and Royalty Free licenses to be given to INCOIS for the content to be played and to change the content whenever needed.
- The successfulbidder shall submit a signed declaration confirming authorized usage rights for all third-party graphics and information used.
- 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 successfulbidder 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 successful bidder 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 Successful bidder 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:
- Successful bidder 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 Successful bidder 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 successful bidder 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 Successful bidder 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 Successful bidder 's scope and covered by the quoted lumpsum price, with no additional claims admissible on this account.

4.1.6 Working Conditions and Coordination. AllWorks 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 Successful bidder s etc).

4.1.7 Qualified Professionals. The Successful bidder 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 Successful bidder 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 - Successful bidder 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 Successful bidder 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,CCTV and 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 replacement of existing flush doors with fire rated 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.All raw power and UPS-backed feeds for the Centre shall be tapped from the Ground Floor Electrical Panels Room. Contractor shall provide new feeders/raceways/risers/cabling/distributions and complete terminations as required, in coordination with INCOIS. No temporary/unsafe taping shall be permitted.
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 Successful bidder 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 Successful bidder 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 GPBAASRISitefor the GPBAASRI site, no interior or MEP works are in scope. However, the Successful bidder 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.g. RPWD 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 Successful bidder Responsibility. The Successful bidder 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 Successful bidder is limited to equipment related design, supply and documentation as defined elsewhere in the tender.

4.5.3 Bill of Materials (BoM). The Successful bidder 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.

Bidders are required to submit a Preliminary Bill of Materials as part of the technical bid – essentially a high-level BoM aligned with their proposed concept design. This should list major items by zone (e.g. "flooring – approx. X sqm, type; No. of projectors; servers; major furniture") with specifications and makes/models if decided. This BoM shows the bidder's understanding and quality intent. However, precise quantities may change during the Detailed Design phase after award. The contract is a fixed-price lump sum for delivering the approved concept turnkey. Therefore, any quantity variations needed to realize the concept as approved are the bidder's responsibility and will not warrant a price change. Only if there's a client-initiated scope change beyond the original tender requirements would a change order and price adjustment be considered. In practice: after award, the bidder will prepare a detailed GFC design and final BoM (Milestone-1 deliverable), and if it's within the originally envisaged scope, the lump sum is unchanged even if some line items differ from the preliminary bid BoM.

4.5.4 Equipment Schedule Reference. The Equipment Schedule (Annexure-IV) attached with the tender shall be treated as integral to this Scope. The Successful bidder '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 Successful bidder 's scope and price.
4.5.5 All the samples, materials, shades, schemes must be approved by INCOIS before execution.

The consolidated museum-grade interior materials & workmanship specifications are enclosed at Annexure VIII.

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 360ºVisual 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 System 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 Successful bidder 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 Successful bidder '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. Until Warranty, successful bidder s need to pay the license/subscription fees. Post warranty, INCOIS will make the payments.

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 Deliverables

Sl. No.	Deliverable	Description
1	3-Year Warranty	Full onsite support, repairs, PM.

6. Eligibility Criteria

Only those bidder s 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 bidder 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 Bidder 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 Bidder should provide an escalation matrix with full contact details, for the resolution of reported issues during the Warranty period.

6.4 The Bidder 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 bidder does not have an office in Hyderabad, bidder should submit an undertaking that an office will be established at the time of delivery of the product.Undertaking is acceptable at a bid stage and post contract. Support centre must be functional no later than commencement of onsite installation (or within 30 days of LOA) and must remain available through warranty for onsite support.Failure to do so will constitute ground for termination and /or forfeiture of Performance Security.

6.5 The bidder should have an average annual financial turnover of **Rs. 3.55Cror** 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 The Bidder shall have a minimum of Three (3) years of relevant experience in execution of works of similar nature in Government / Semi-Govt / Private sector entities. The experience shall be substantiated by submission of at least one Work Order/Contract issued not less than five (5) years prior to bidclosing date of this tender.

Further, preferably, the Bidder shall be an active entity and have executed or be executing at least one (1) work of similar nature during the last two (2) years prior to bidclosing date of this tender. This shall be supportedwith Work Order(s)/Contract(s), Completion Certificate(s), Client Satisfactory Performance Certificate(s), valid Work-in-Progress Certificate issued by the client and/or TDS Certificates reflecting the payment value, to establish authenticity of the claimed experience.

During the last five (5) years, the Bidder must have successfully completed works of similar nature meeting **any one** of the following value criteria:

(a) **One (1) work** of value not less than **₹5.69 Crore**, or

(b) **Two (2) works**, each of value not less than **₹4.26 Crore**, or

(c) **Three (3) works**, each of value not less than **₹2.84 Crore**.

Similar nature of work shall mean *Design, development, and deployment of customized 2D and 3D visual systems–based services for immersive experiences, including Virtual Reality (VR), Augmented Reality (AR), and Holographic systems.*

6.7 MSME/Startup exemption shall be given for turnover criteria as per GFR rules on submission of relevant proof.

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 bidder must have at least 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. For employment proof, either EPF challan filing or an undertaking with details of consultants for these technical roles such as name, number of years of experience, address, educational qualifications, brief background, organization hierarchy structure of team members is allowed. The Core Project Team (Project Manager, Lead Developer, Solution Architect) must have atleast four years of experience.

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

6.11Bidder 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.

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

6.13 Bidder 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 (spares, firmware, etc). Bidder should submit all the relevant product catalogues / data sheets.

Successful bidder s should ensure a 3-year warranty.MAF is required for major OEM equipment and critical items; Commodities exempt (bidder warranty applies). Critical items involve VR headsets, supporting systems, projectors, holographic devices.

6.14 Bid Security (BS) as per section 10, Point No. 12.

6.15 Startups: To promote make in India and startups, the prior turnover for all startups shall be relaxed subject to their meeting of quality, technical specifications and tender conditions as per tender. The bidder 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.

6.16 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 willbe required for formulating appropriate turnkey solutions. Therefore, the bidder may perform a site visit to understand the project better way. The site visit will be held on the same day as the pre-bid meeting date (as mentioned at Page 1).

7. Contents of the Bid

The quote should be submitted inatwo-bidformat. (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
- Undertaking from the Successful bidder to ensure continuous operation during warranty for all the bill of materials. MAF is to be submitted for the critical items. Critical items involve VR headsets, supporting systems, projectors, holographic devices.
- 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, cyber security, warranty 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 execution. milestones in Content design & finalization, Content development, Hardware delivery & installation, Interior

design & implementation, Integration & Testing, Acceptance & Training, Risk Management & Contingency plans to be indicated.

- **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)

NOTE:

The documentary proof attached should be legible and relevant Offers without the following documents will not be accepted:

(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.
(v) Part/conditional/incomplete quotations.

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>Bidder Name, Address, Email, Contact Number</td><td></td><td></td></tr>
<tr><td>2</td><td>Bidder Bank Details</td><td></td><td></td></tr>
<tr><td></td><td>Name of the Bank</td><td></td><td></td></tr>
<tr><td></td><td>Branch address</td><td></td><td></td></tr>
<tr><td></td><td>Account holder name</td><td></td><td></td></tr>
<tr><td></td><td>Account number</td><td></td><td></td></tr>
<tr><td></td><td>IFSC CODE</td><td></td><td></td></tr>
<tr><td></td><td>PFMS Account No.</td><td></td><td></td></tr>
<tr><td>3</td><td>Bidder '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 should 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, and 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 bidder 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>The Bidder shall have a minimum of five (5) years of relevant experience in execution of works of similar nature in Government/Private sector entities. The experience shall</td><td></td><td></td></tr>
</table>

	be substantiated by submission of at least one Work Order/Contract issued not less than five (5) years prior to bid closing date of this tender. Further, preferably, the Bidder shall be an active entity and have executed or be executing at least one (1) work of similar nature during the last two (2) years prior to bid closing date of this tender. This shall be supported with Work Order(s)/Contract(s), Completion Certificate(s), Client Satisfactory Performance Certificate(s), valid Work-in-Progress Certificate issued by the client and/or TDS Certificates reflecting the payment value, to establish authenticity of the claimed experience. During the last five (5) years, the Bidder must have successfully completed works of similar nature meeting any one of the following value criteria: (a) **One (1) work** of value not less than **₹5.69 Crore**, or (b) **Two (2) works**, each of value not less than **₹4.26 Crore**, or (c) **Three (3) works**, each of value not less than **₹2.84 Crore**. Similar nature of work shall mean *Design, development, and deployment of customized 2D and 3D visual systems-based services for immersive experiences, including Virtual Reality (VR), Augmented Reality (AR), and Holographic systems.*		
12	Client-side Technical Contact details		
13	Undertaking from the Successful bidder to ensure continuous operation during warranty for all the bill of materials. MAF is to be submitted for the critical items. Critical items involve VR headsets, supporting systems, projectors, holographic devices.		
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 Bid Security		
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	Integrity Pact as per (Annexure VII)		
23	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	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 360⁰Visual 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		
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 deliverables) of	LS	1	

	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 Successful bidder 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.			

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 successful 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.

Penalty during SITC: In case the supply/delivery/services are delayed and if the delay is attributable to the successful bidder 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

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	**Project Plan, Approach and Methodology (Score: 16)- Detailed Solution Architecture and Timelines to be covered** • Clarity of concept (2) • 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) • Use of VR development frameworks/standards (1)				**16**

	• Development approach proposed (1) • 3D content realism enhancement mechanism (2) •				
2	**Draft Storyboard Conceptualization (Score:20)** **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) (6) • Any introduction of innovative concepts (say interactions/additional features etc.) (4) • Introduction of any AI elements (3) • Adapting the storyboard for different immersive experience devices (3)				**20**
3	**Demo of content (Score: 35)** • VR Demo is aligned closely with requirements of the given script (Accuracy, Completeness, Innovations) (4) • Interaction & UX elements (4) • Texture quality in the demo (3) • 6 DOF virtual reality experience (4) • Use of high-quality models efficiently (2) • Sculpting, Lighting, Shadows (3) • 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				**35**

	scientific principles (2) • Screen transition smoothness(3) • Audio effects: Recorded voice over (128 kbps), voice over clarity, sound effects, Emotion (2) • Demo includes VR headsets 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)				
4	**Hardware Integration Capability (Score: 15)** **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 of the devices (3) • Previous work demo shown on customized devices (like interactive wall projection systems, other holographic devices etc.) (5) • Proposal for innovative and simple immersive experience devices (2)				**15**
5	**Spatial Design, Interior Layout & Museum-Grade Experience (Score: 14)** **Overall spatial concept & visitor journey (INCOIS) – 4 marks** Clarity of zoning Quality of visitor flow: intuitive direction, no dead-ends, appropriate circulation widths, provision for both short visits and full tour paths. **Conceptual layout & 2D plans for both sites – 3 marks** Appropriateness of placement of				**14**

	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 exhibits, 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 maneuverability). **3D visualization / 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 1-3 minutes **"Demo"** should be 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 by including creativity, innovation, UX experience, performance etc.
- The Demonstration should include VR headsets (PC Based) at a minimum, and optionally any other experiences (for e.g. low-cost AR/WebXR) as suitable. Any additional devices will be part of the scoring. 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 - Project Plan, Approach and Methodology: Minimum 11 out of 16 marks
    - Sl. No. 2 - Draft Storyboard Conceptualization: Minimum15 out of 20 marks
    - Sl. No. 3 – Demo of Content – Minimum30 out of 35 marks.
    - Sl. No. 4 - Hardware Integration Capability – Minimum 10 out of 15 marks.
    - Sl. No. 5 – Spatial Design, Interior Layout & Museum-Grade Experience: Minimum 9 out of 14 marks.
- Bidders failing to achieve these sub-minimum scores shall be treated as technically non-responsive, even if their overall technical score is 75.
- 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 bidders 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. 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.

3. 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.

4. 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.

5. Offers received without Bid Security 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.

6. Validityof Offers: Bid should have a validity period of 90 days from the bid closing date.

7. Delivery Period: Split into design approval phase and execution phase. 4 months for the execution phase once design is approved by INCOIS. Details are specified in section 3.4.1 Delivery Timeline.

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

9. 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 within 10days, then PO would be deemed accepted and binding to the successful bidder.

10. **Payment terms:**

All payments shall be made against verified deliverables and certification by INCOIS.
No advance payments shall be made.
The quoted prices shall be all-inclusive. Taxes and duties shall be payable as per applicable law.
Percentages mentioned below are applied to the **Total Contract Value (TCV)**.

Milestone No.	Milestone Description	Payment %
1	Completion of all the phases below and acceptance of the solution **DesignApproval**: Submission of design and INCOIS approval of: (a) master architectural and interior layouts, zoning and visitor-flow plans; (b) coordinated MEP concept drawings; as required under Sections 3, 4 and 5. **Delivery of Equipment and Interior Materials**: Physical delivery at INCOIS (and GPBAASRI, wherever applicable) of all the immersive devices, supporting systems and interior fit-out materials, as per approved BoM, and verification by INCOIS (Delivery Challans / CRAC). **Custom Scientific Content Design &Development – Acceptance** Preparation of content storyboards / flow diagrams for all 5 INCOIS services in collaboration with INCOIS and approval from INCOIS. Completion of all custom 2D/3D/VR/AR/holographic content for the 5 services, demonstrated on the devices. Acceptance shall be based on agreed storyboards, scientific correctness and functional/acceptance test procedures as listed in Section 3.3.6. **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. **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)	90% of TCV

	resolution of all punch-list items and issue of Final Acceptance Certificate by INCOIS.	
2	**Balance payment**	**Retention / Warranty Holdback:** 10%TCV will be released after of 3-year warranty period (or) will be released earlier against submission of equivalent Bank Guarantee valid for the warranty duration with a 60 day claim period.

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.

Net payment will be released after statutory deductions.

11. 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 not replaced with 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 successful bidder fails to resolve the reported issues within72hrs, INCOIS will take up alternative measures for resolving the issues at risk and cost of the successful bidder. And this step of INCOIS should not have any implications on the already agreed support for the systems / peripherals provided.

12. Bid Security (BS)Rs.14,24,000/- (Rupees fourteen lakhs and twenty-four thousand only) has tobe submitted as per the following form/ options:

    a) Demand Draft
    b) Insurance Bond
    c) e-Bank Guarantee valid for 45 days beyond the bid validity period
    d) Fixed Deposit Receipt in favour of Director, INCOIS payable at Hyderabad
    e) Bid Security declaration on the tendering firm's letter head duly signed and stamped by the authorized signatory as per Annexure-VI
    f) Online payment through NEFT/RTGS as per Bank details given below:
    Name of the Bank: SBI, HAL Campus
    Branch: HAL Campus
    Account Name: Director, INCOIS
    Account No.10442322840
    IFSC Code: SBIN0001676

    The scanned copy of the same is to be uploaded to the GeM Portal while submitting the tender. Bank Guarantee 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 within 5 working days of Bid opening, failing which the bid may treated as incomplete & may lead to rejection of the bid by buyer without making any reference to the bidder.

13. Performance Guarantee: Successful bidder mustsubmit 05% of the contract value, valid for 38 months, within 15 days of acceptance of contract, towards Performance Guarantee as per the following form/ options:

    a) Demand Draft
    b) Insurance Bond
    c) e-Bank Guarantee
    d) Fixed Deposit Receipt in favour of Director, INCOIS payable at Hyderabad
    e) Online payment through NEFT/RTGS as per Bank details given below:
    Name of the Bank: SBI, HAL Campus
    Branch: HAL Campus
    Account Name: Director, INCOIS
    Account No.10442322840
    IFSC Code: SBIN0001676

    The scanned copy of the same is to be uploaded to the GeM Portal while submitting the tender. Bank Guarantee 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 within 5 working days of Bid opening, failing which the bid may treated as incomplete & may lead to rejection of the bid by buyer without making any reference to the bidder.

Performance Guarantee is liable to be invoked in the event of

a. Non-execution contract during validity period of the contract
b. If the service of the successful bidder is found to be unsatisfactory and fails to adhere to our tender terms and conditions
c. Any unilateral revision/decision made by the successful bidder during the validity period of the contract.

14. 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 successful bidder.

15. 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.

16. Liquidated Damages Clause: In case the supply/delivery/services are 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 Bidder Inc., on 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
    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.

d) To extend the period of delivery with or without penalty which will not be more than agreed liquidated damages referred to in clause (a) above.

17. *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.
18. If any bidder withdraws his tender after price bid is opened, with in the validity period or makes any modifications in the terms and conditions of tender, 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 apart from other administrative activities.
19. Defect Liability Period if any: Same as Warranty Period.
20. 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.
21. 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.
22. Director, INCOIS reserves the right terminate the contract either whole or part of the contract with one month notice and bidder shall not have any claim whatsoever on this account.
23. 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.
24. Clarifications: For clarifications related to tender (format attached as Annexure - X), 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"**.

Signature of the Bidder / Authorized Signatory & date

Name OFFICE SEAL, Address

Note: The bidder /bidder 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:

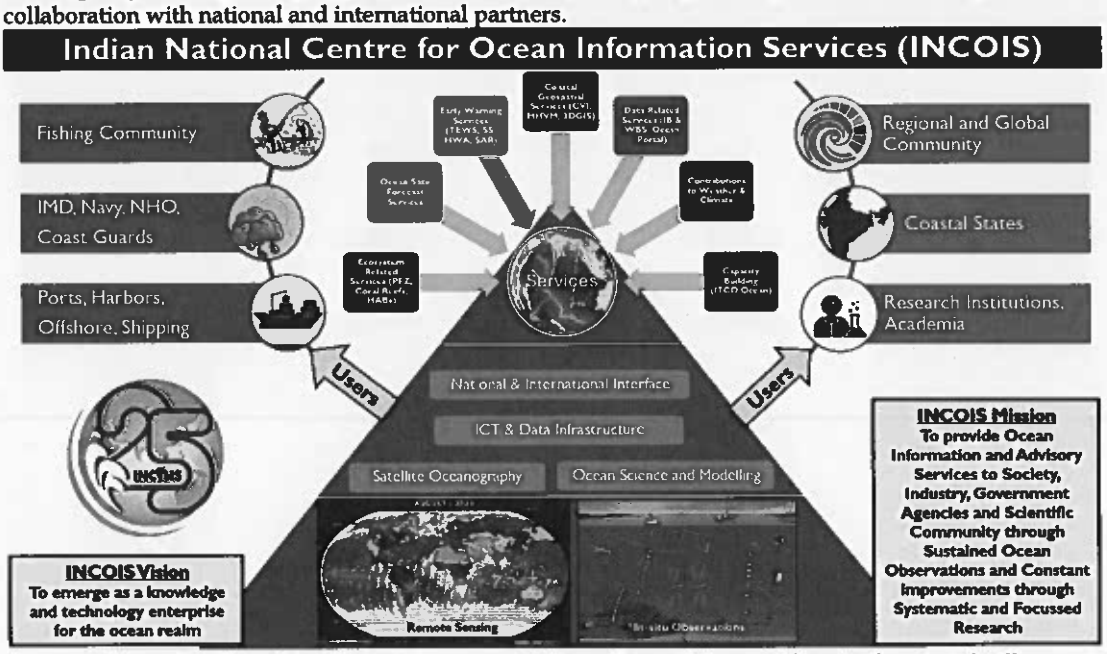
- A deeper understanding of how marine heatwaves and coral bleaching occur.
- Insights into the ecological and economic importance of coral reefs.
- Awareness of the need for conservation efforts and climate action to protect marine ecosystems.

ANNEXURE-II

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:

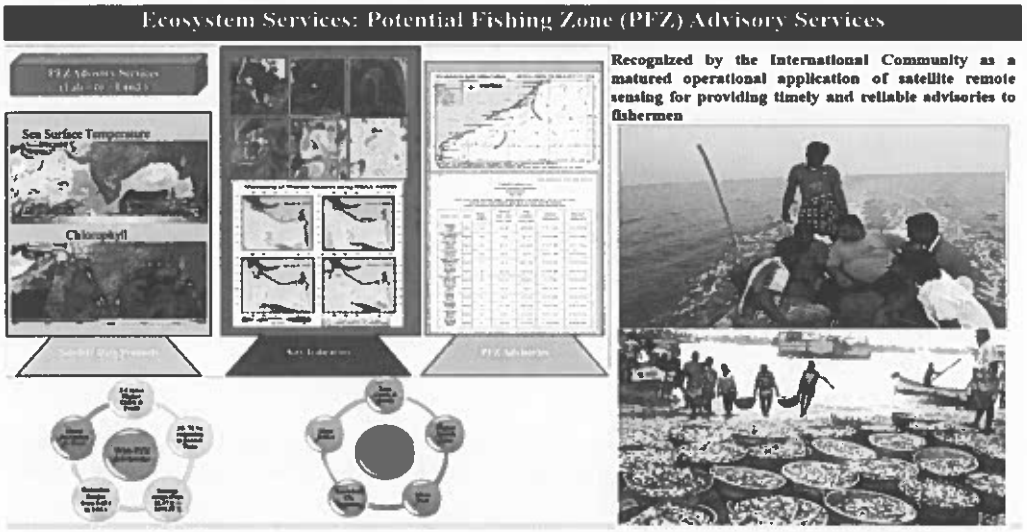
Potential Fishing Zones (PFZ) Advisories:

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

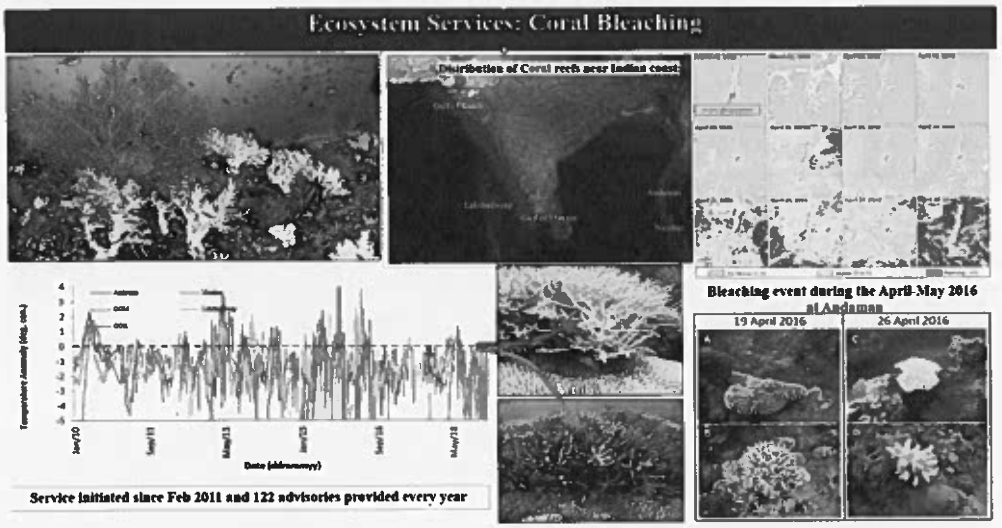


Coral Bleaching Alerts System (CBAS)

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.

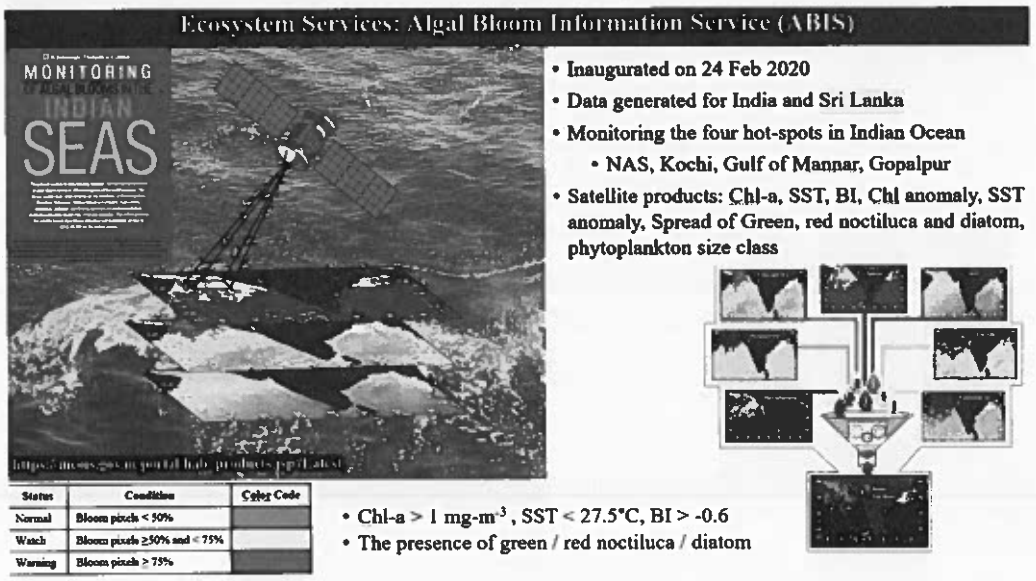


Algal Bloom Information Services (ABIS)

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.

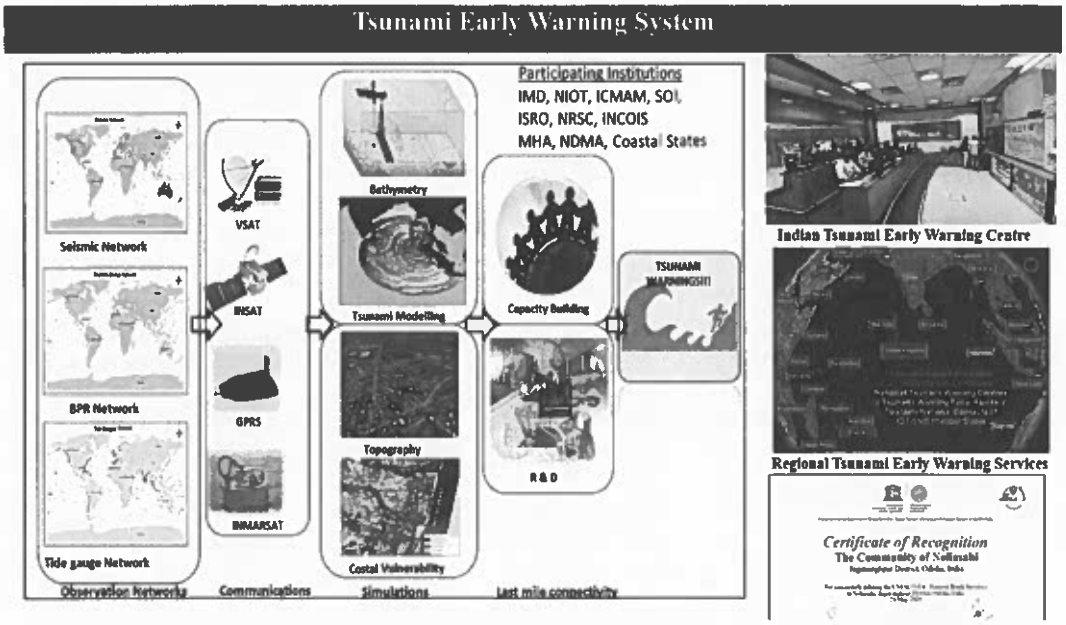


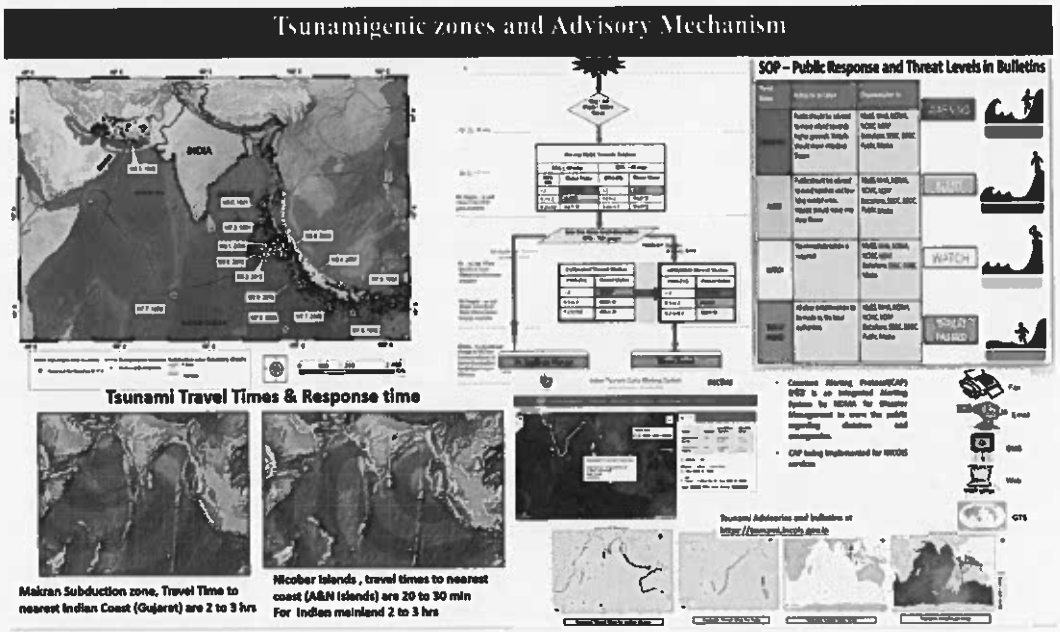
Multi-Hazard Services:
Tsunami Early Warning Services

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.





Ocean State Forecasts (OSFs)

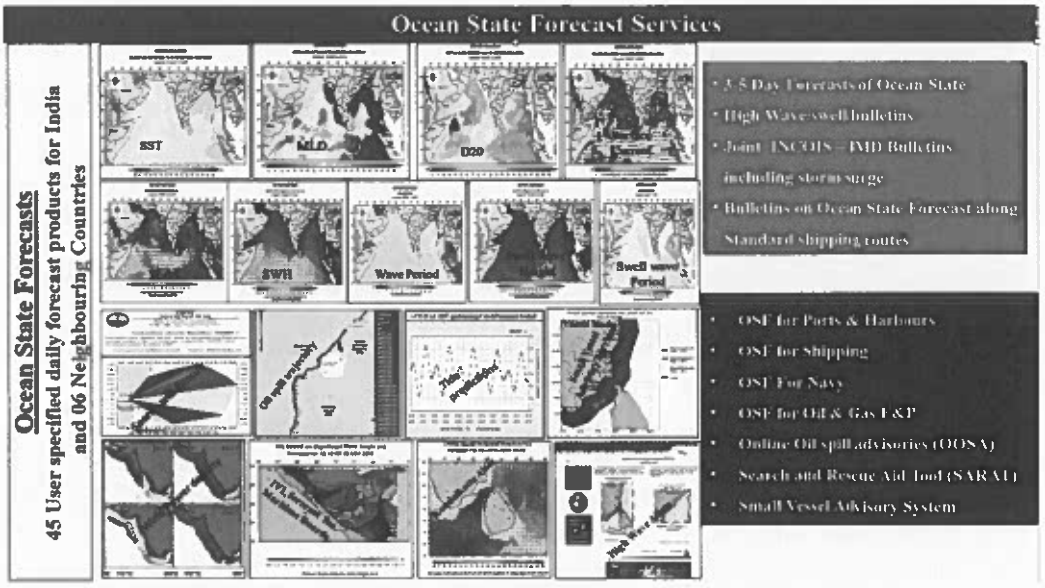
Objective: To provide real-time, user-specific ocean condition forecasts, including waves, swell, currents, winds, SST, etc. through numerical models and ocean observations.

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.



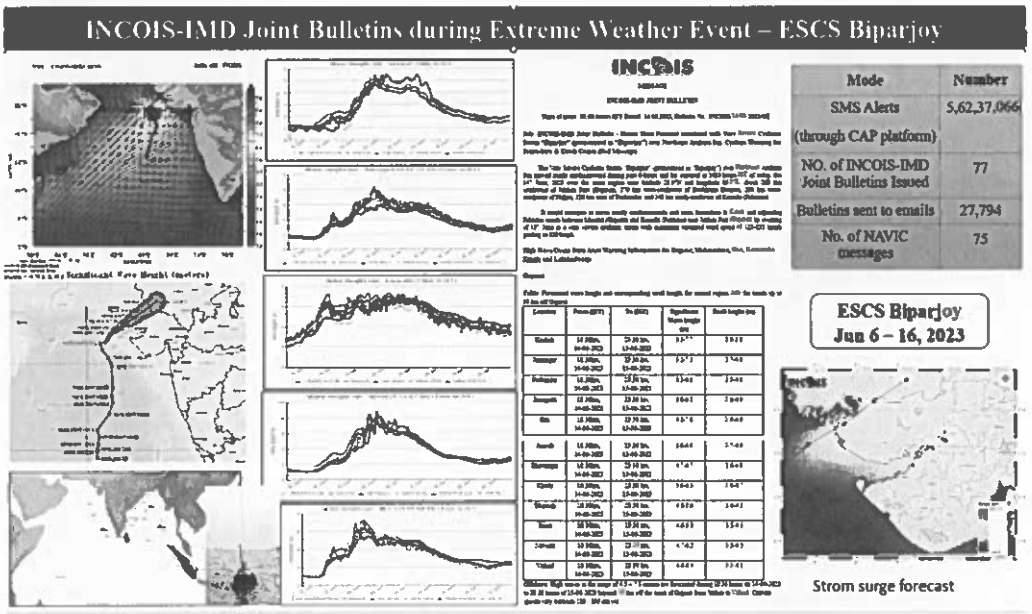
High Wave/Swe Surge/ Ocean Currents Alerts/Warnings

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.

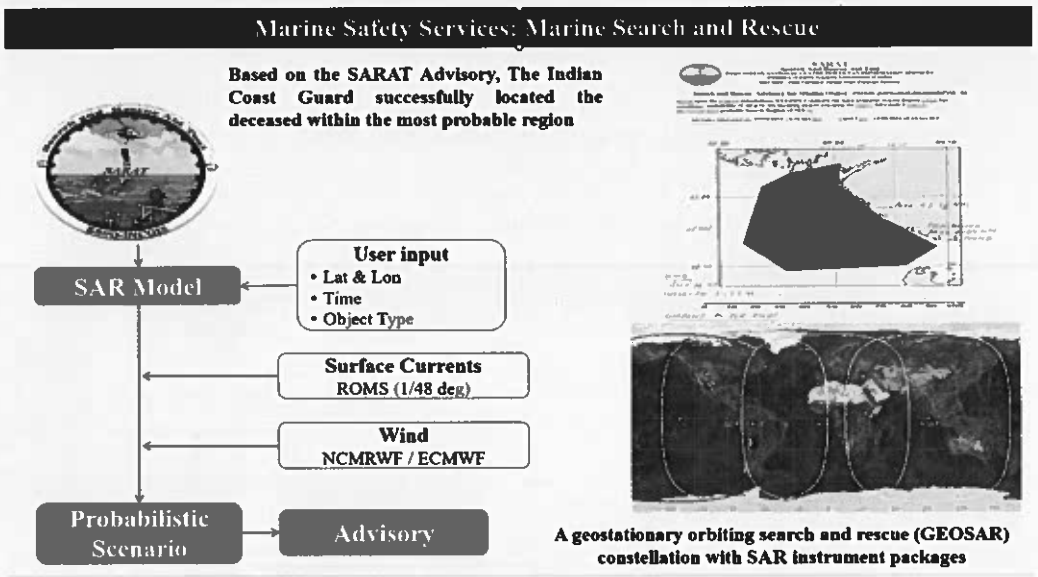
Users: Disaster Management Authorities, IMD, Navy, Coast Guard, Coastal Communities, Government Agencies, Coastal Residents and port authorities.

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.



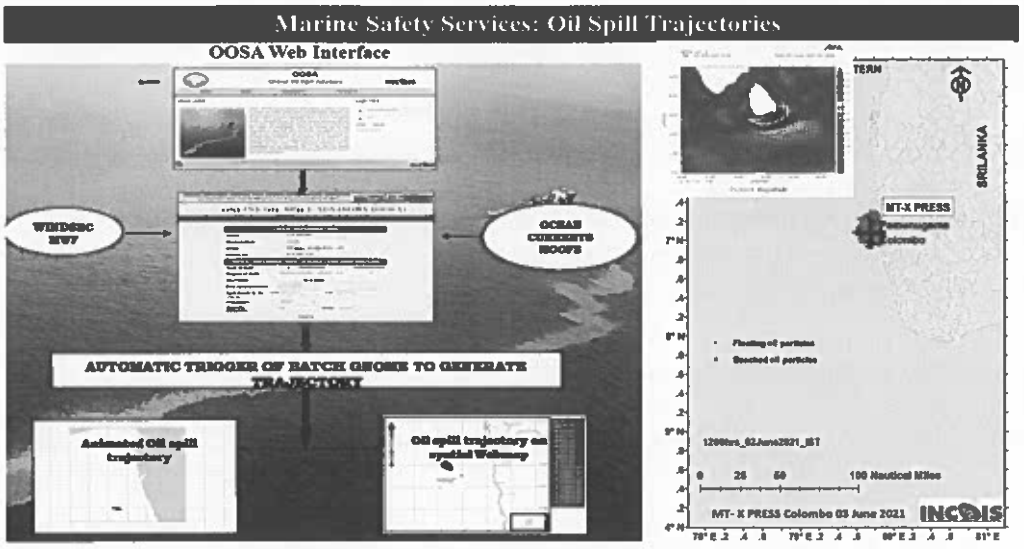
A geostationary orbiting search and rescue (GEOSAR) constellation with SAR instrument packages

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.

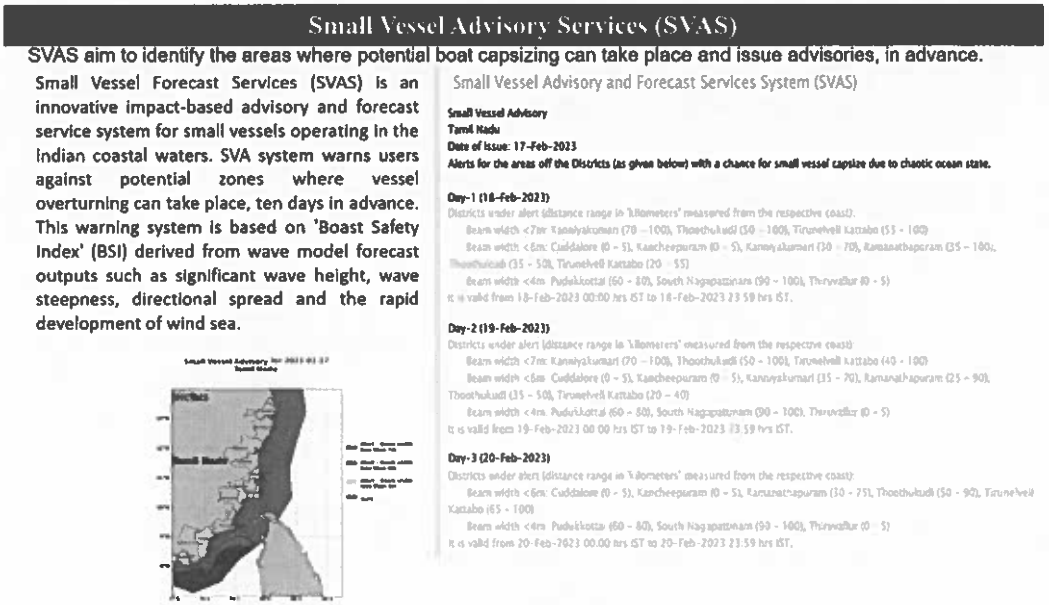


Small Vessel Advisory Services (SVAS)

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.

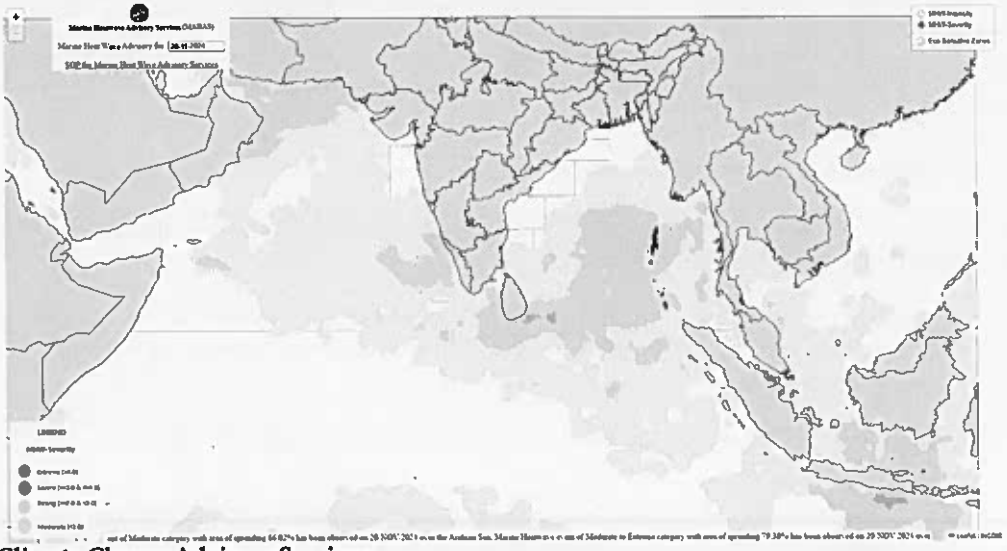


Marine Heatwave Advisory Services (MAHAS)

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.

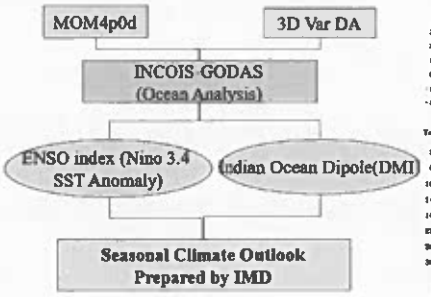
Users: Fishermen, coastal communities, marine researchers, environmental protection agencies, Project Investigators, NGOs and public health authorities concerned with water quality and marine safety.

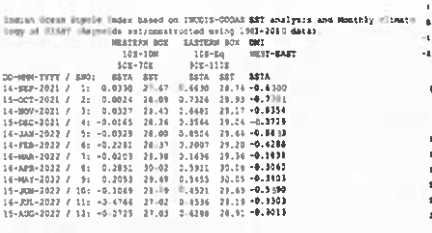


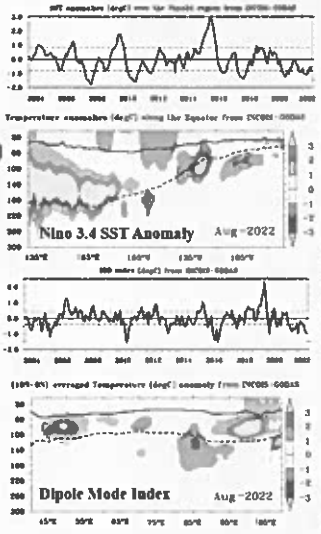
Ocean Climate Change Advisory Services:

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







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

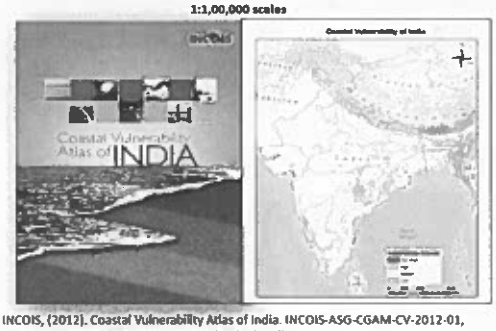
Coastal Vulnerability Maps:

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

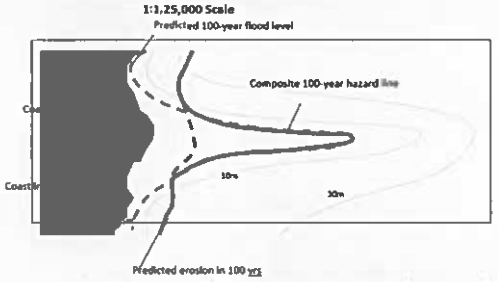


INCOIS, (2012). Coastal Vulnerability Atlas of India. INCOIS-ASG-CGAM-CV-2012-01, Pages 212, Maps 156, INCOIS, Hyderabad, India. ISBN 978-81-923474-0-0.

Parameter	Data
Geomorphology	IRS LISS-IV
Slope	GEBCO
Elevation	SRTM / CartoDEM (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

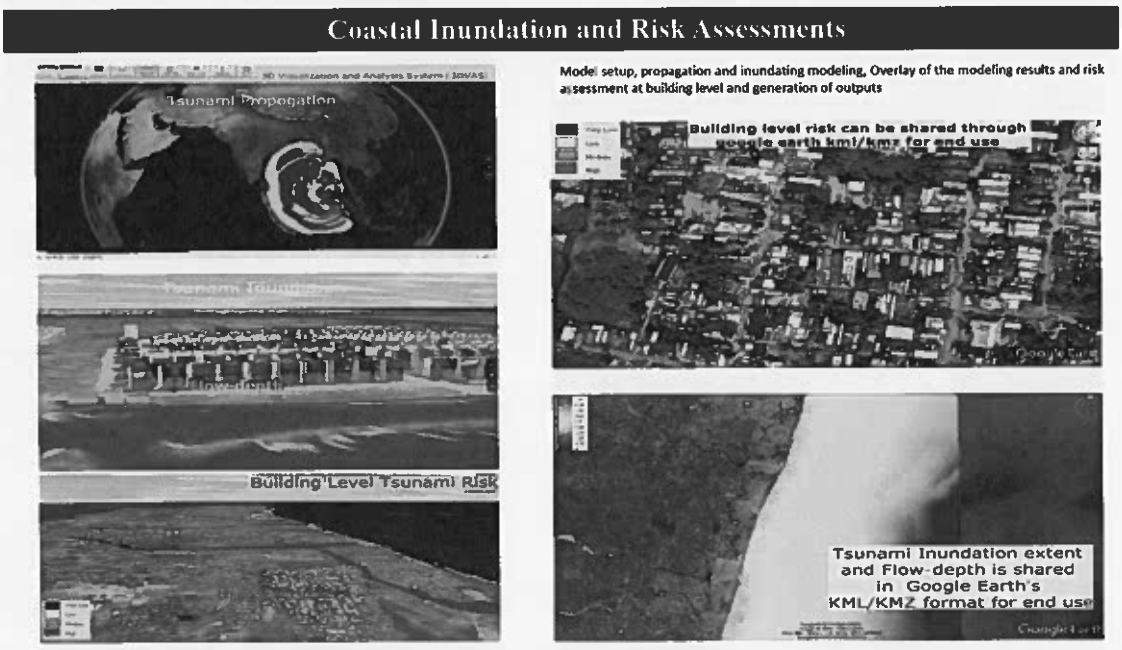
1:1,25,000 Scale



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

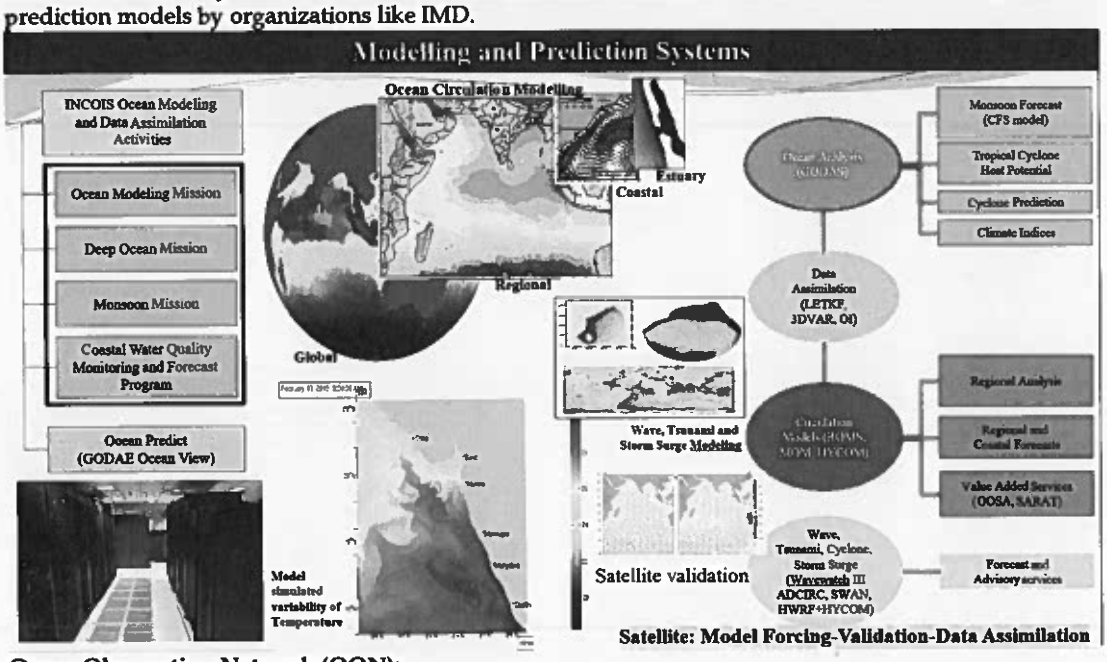
Multi-hazard Vulnerability Map

Coastal Inundation – 3D Mapping



Numerical Ocean Modeling:

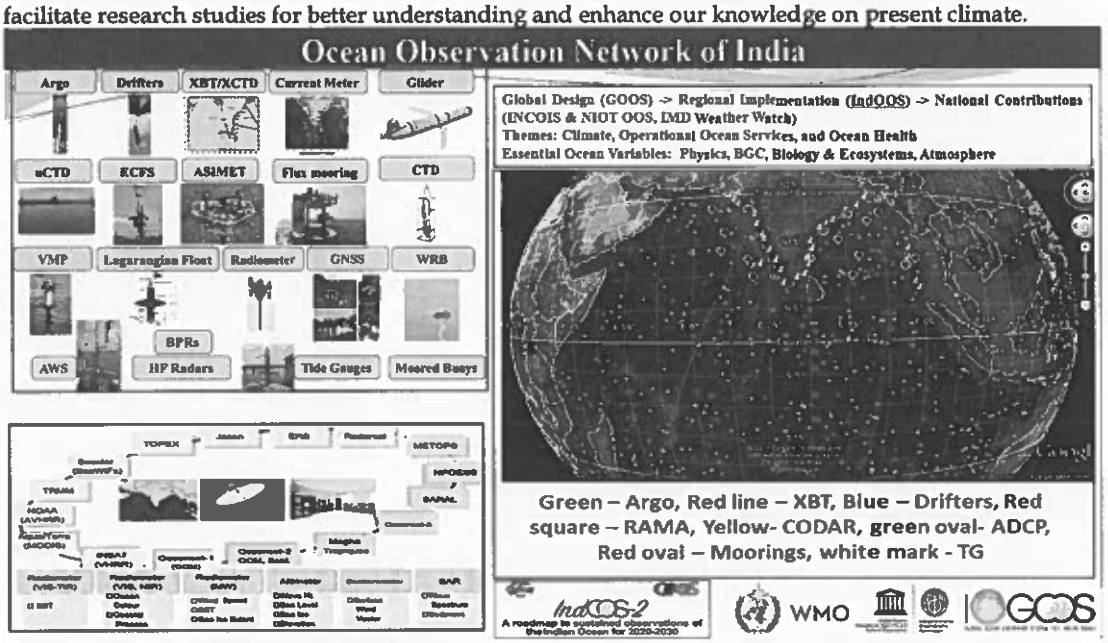
This activity in INCOIS is aimed at configuring the models and data assimilation systems to predict various ocean parameters such as waves, currents, tsunami, storm surge, temperature, salinity, sea level etc. A suit of numerical models such as Modular Ocean Model, Hycom, Regional Ocean Modeling System, 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):

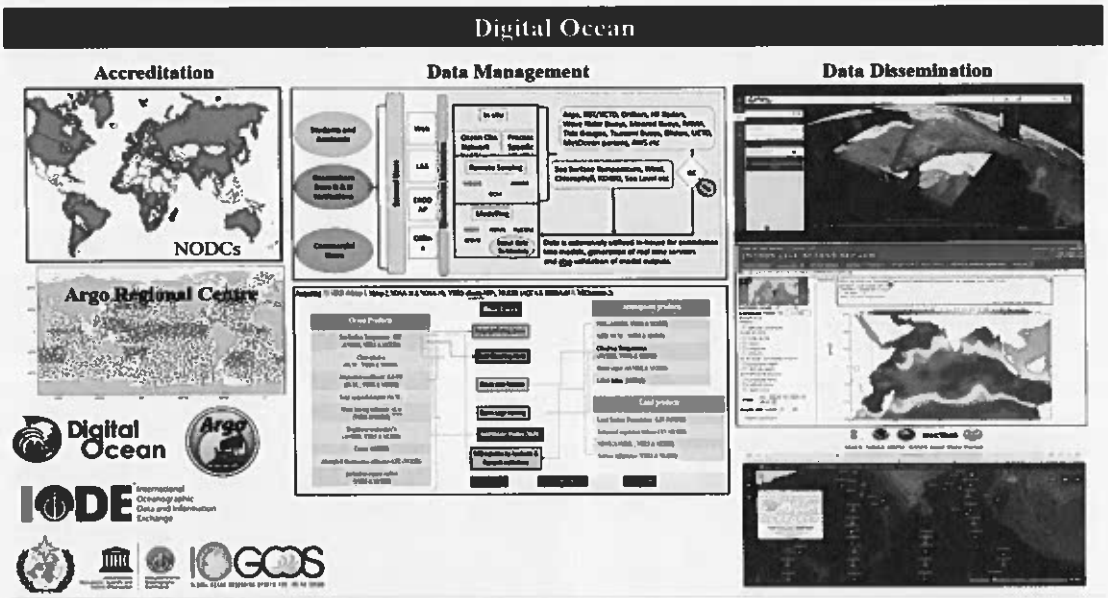
The primary objective of Ocean Observation Network (OON), is to establish and maintain various in-situ observation platforms, such as Argo floats, satellite-tracked surface drifting buoys (drifters), expendable bathythermograph/expendable conductivity temperature depth (XBTs/XCTDs), ship-board Automated 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.



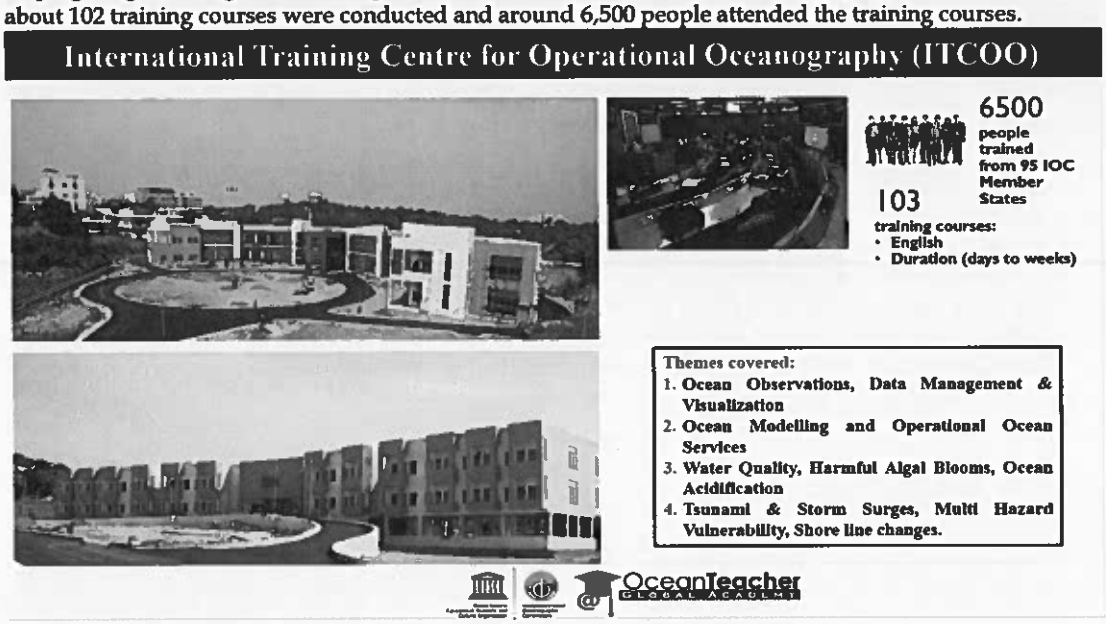
Ocean Data Services:

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

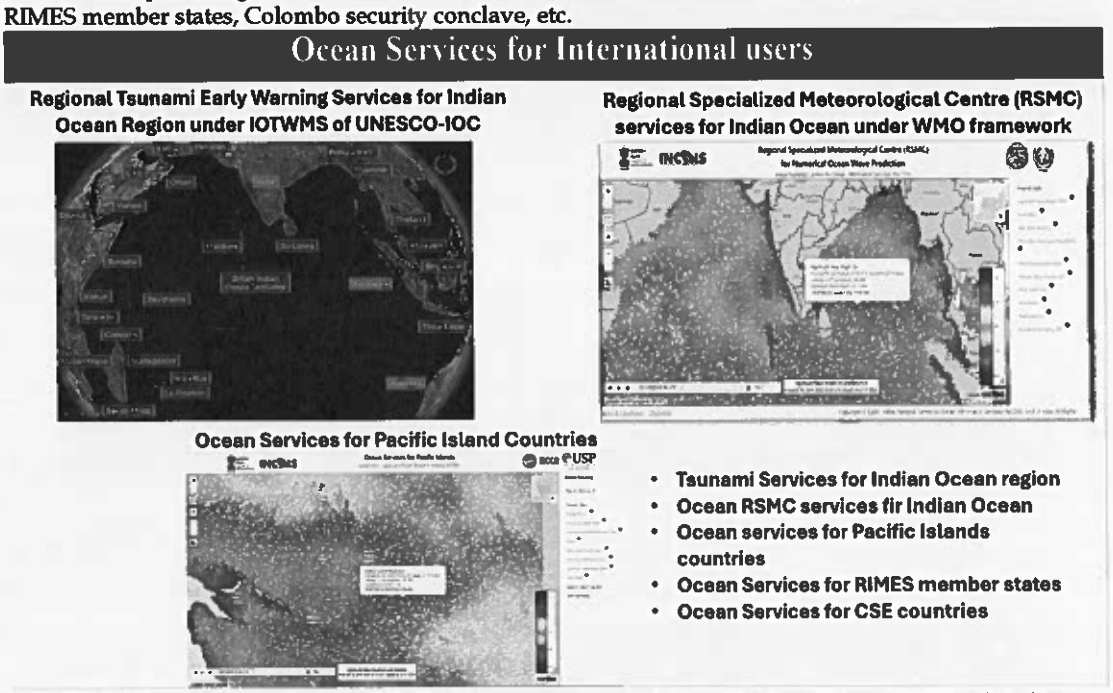
Venkatraipur and Noliasahi villages as Tsunami ready communities by the UNESCO-IOC. India is the first country to achieve this distinction in the Indian Ocean region. Other coastal states of India (Gujarat, Kerala, Tamil Nadu, Puducherry, West Bengal and Andaman & Nicobar Islands) are impending this 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:

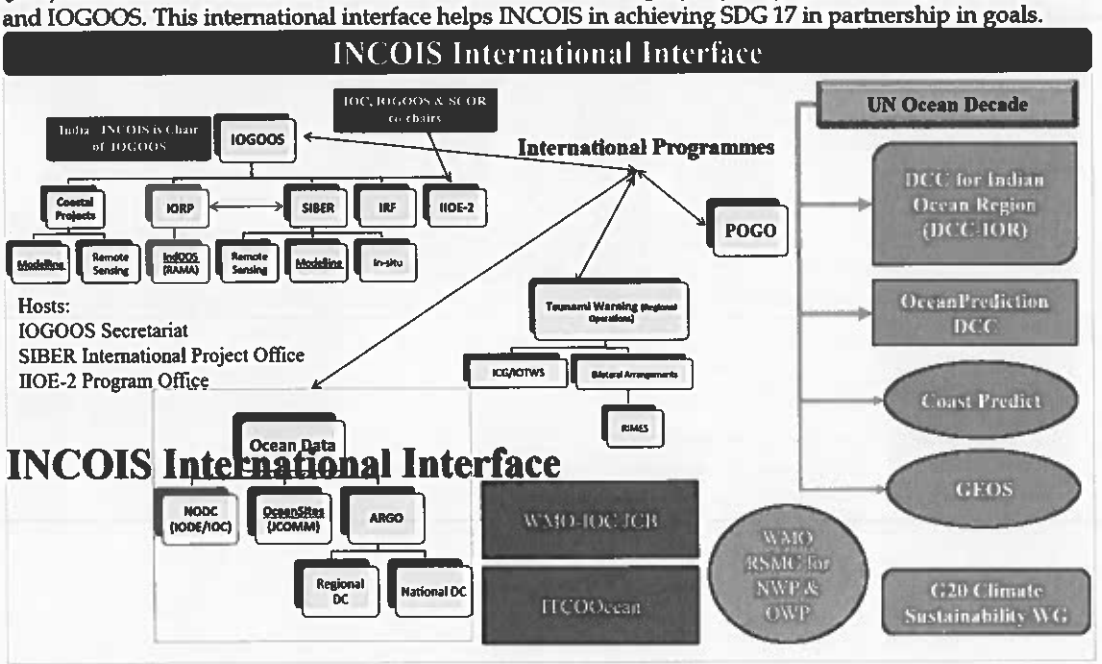
International Interface and Services:

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.



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.



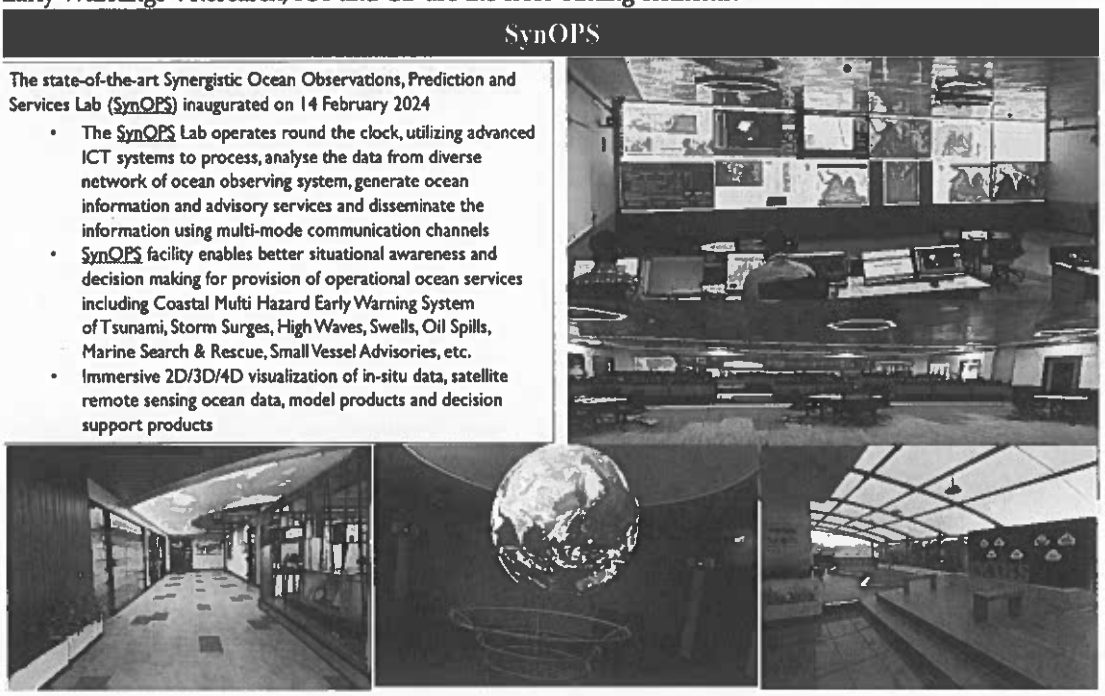
Synergistic Ocean Observation Prediction Services (SynOPS):

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.

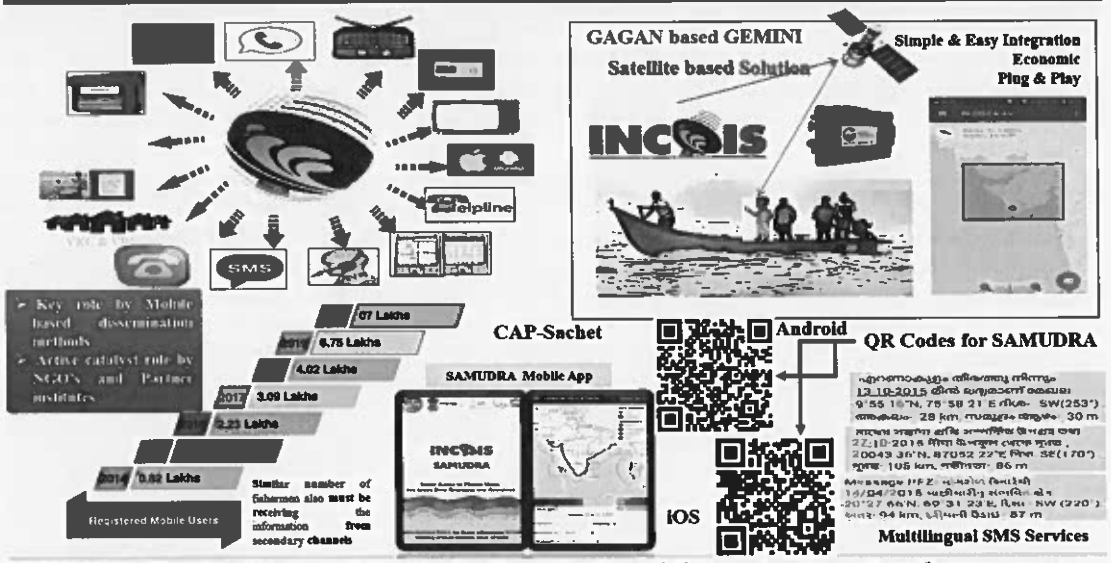
The main outcomes / deliverables "Observation Networks", "Data Systems including Digital Ocean", "Unified Modelling and Data Assimilation" and "Services including Ocean and Coastal Multi hazard Early Warnings". Research, ICT and CD are the cross-cutting elements.



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.

Information Dissemination



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-IV

Equipment Schedule for planning Interior furnishing works

#	Equipment	INCOIS	Birla
1	3D Stereoscopic Immersive Visualisation	8×8m	6×6m
2	Immersive Projection Room with 360⁰Visual 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 -V

BID-SECURING DECLARATION FORM

Bid No. INCOIS: PUR:49/2025 date _____"Turnkey Design, Development, Supply, Installation, Testing, Commissioning and Integration of Immersive Experience Centre at INCOIS and GPBAASRI -

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 two years 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 Bidder/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 -VI

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 and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this____day of_20____.

THE CONDITIONS of this obligation are:

1. If the Bidder Withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or

2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity:

   (a) fails or refuses to execute the Contract Form if required;or

   (b) fails or refuses to furnish the performance security, in accordance with the instruction to Bidders.

We undertake to pay the Purchaser upto the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it, owingtotheoccurrenceofone orbothofthetwoconditions,specifyingtheoccurredconditionorconditions.

Thisguaranteeshallremaininforceupto_____fromthedateofsubmissionofthebidand anydemandinrespectthereofshouldreachtheBanknotlaterthantheabovedate.

(SignatureoftheBank)

NameoftheBidder

Annexure VII

INTEGRITY PACT

(To be submitted on Plain Paper)

General

This 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."**andthe BIDDER/ 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 favour 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 immediatelycancel thecontract, ifalready signed, 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 debarthe BIDDERfrom participatingin futurebidding 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 theBIDDER shallbe finaland conclusiveon 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 Monitorwill submita writtenreport tothe 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._____

CONSOLIDATED MUSEUM-GRADE INTERIOR MATERIALS & WORKMANSHIP SPECIFICATIONS

INCOIS ITCOOcean Experience Centre - Turnkey Interior Works & Interior-Integrated MEP/ICT

1.0 GENERAL, SCOPE COMPLETENESS AND BASIS OF ACCEPTANCE

1.1 These specifications define the minimum acceptable materials, systems, workmanship, testing, documentation, maintenance and warranty obligations for a museum-grade, high-footfall public interior and all interior-integrated works required to deliver a complete, safe, code-compliant and inauguration-ready Experience Centre. The Contractor shall include, without extra cost, all ancillaries and works necessary for completeness, including but not limited to: sub-frames/backing, blocking and reinforcements for heavy mounts, fixing hardware, trims, reveal profiles, corner protection, edge sealing, access panels, fire-stopping, acoustic sealing, making good of disturbed surfaces, removal of debris, final cleaning and protection until handover.

1.2 All products and systems shall be commercial/public grade, suitable for high traffic, frequent cleaning and continuous operation. Any deviation from these minimum measurable criteria shall be supported by datasheets and test certificates and shall require written approval prior to procurement.

1.3 Interface note (mandatory): Normal power and UPS-backed power for the Experience Centre shall be tapped/extended from the Electrical Panels Room located at Ground Floor of the same building. The Contractor shall include feeder sizing, containment routes, terminations, protective devices, segregation of UPS/non-UPS circuits, labelling, earthing/bonding and all coordination required to deliver usable power at all DBs, racks and final outlets within the Centre.

1.0.4 Brand neutrality: All requirements are functional/performance-based. Contractor may propose any equivalent make that meets or exceeds these requirements, subject to written approval. Any scope necessary for complete and code-compliant installation shall be deemed included even if not expressly mentioned; no extra claims shall be entertained for such completeness items.

2.0 STANDARDS, COMPLIANCE AND PERFORMANCE BENCHMARKING

2.1 Compliance: Works shall comply with NBC 2016 (Part 4 Fire & Life Safety and other applicable parts), relevant BIS/IS standards, and applicable IEC/ISO/EN/ASTM standards where BIS standards are unavailable. Local Fire NOC conditions and statutory requirements shall prevail. Where two standards conflict, the higher/safe requirement shall govern.

2.2 Fire performance (minimum): Interior finish materials (paints, wall coverings, fabrics, acoustic panels, carpets, floor resins, adhesives and sealants) shall be fire-retardant and suitable for public interiors. Use non-combustible substrates wherever practicable. Fire-rated doors/partitions, where required, shall be tested assemblies with valid type-test certificates for the complete set (leaf, frame, hardware, seals) and shall be installed exactly as per tested configuration.

2.3 Indoor air quality: Paints, adhesives, sealants, flooring resins and composite wood products shall be low-VOC/low-odour. VOC for paints/primers shall be <= 50 g/L (or better). Composite wood (ply/MDF/particle board) shall meet E1 formaldehyde emission class (or better).

2.4 Durability and maintainability: All finishes shall be scratch/scuff/stain resistant and maintainable. High-touch corners/edges shall be protected with corner guards/edge trims. Systems shall be designed for replaceability without visual patchiness (e.g., carpet tiles, modular acoustic panels).

2.5 Acoustic comfort targets: Overall acoustic design shall target reverberation time RT60 <= 1.2 s for typical gallery areas and <= 1.0 s for classroom/briefing areas, achieved via ceiling and wall acoustic treatments and soft finishes where applicable. Noise from HVAC shall be controlled to maintain comfortable conditions (indicative: <= 40 dB(A) in gallery areas).

3.0 SUBMITTALS, MOCK-UPS, COORDINATION AND QUALITY CONTROL

3.1 Mandatory submittals prior to procurement: product datasheets; fire test certificates for relevant finishes; VOC/IAQ declarations; acoustic test reports (NRC/alpha-w, STC/Rw as applicable); electrical/ELV compliance certificates; shop drawings and coordinated services drawings; method statements for specialized works (resin flooring, heavy mounts, ceiling systems); and a complete colour/finish schedule.

3.2 Samples and mock-ups: Provide finish sample boards and on-site mock-ups for critical build-ups (minimum: (a) flooring + skirting + transition; (b) one wall finish with graphic/film and corner guard; (c) one ceiling bay with luminaire + diffuser + access panel; (d) one acoustic panel installation; (e) one signage panel; (f) one typical outlet set including normal and UPS labelling). Approved mock-ups shall become the quality benchmark.

3.3 Coordination and hold points: No closing of ceilings/walls shall occur until MEP/ELV routing, supports, terminations and inspections are completed and approved. Maintain segregation of power and ELV routes. All penetrations through fire/smoke/acoustic separations shall be sealed with approved fire-stopping/acoustic sealing systems prior to concealment.
3.4 Testing and acceptance: Contractor shall perform and submit results for substrate level checks, pull-off adhesion tests where specified, lux measurements, cable certification reports, PA intelligibility checks, CCTV coverage and recording verification, and functional testing of all systems prior to handover.

4.0 FLOORING – VITRIFIED/PORCELAIN TILES (WHERE USED)

4.1 Minimum material performance: Pressed vitrified/porcelain floor tiles, first quality, minimum 10 mm thickness, complying with IS 15622 (latest revision) or equivalent. Slip resistance minimum DIN 51130 R9 for general interiors; for ramps/areas prone to wet cleaning or near entries, provide R10 minimum. Where slip is declared via alternate methods, provide equivalent test evidence. Abrasion resistance shall be suitable for heavy public footfall (commercial grade); submit manufacturer declaration/test report. Impact resistance shall be declared and not less than 2.5 kJ/m² (or equivalent performance declaration) and tiles shall be free from chipping at edges during normal use.
4.2 Build-up and substrate: Provide minimum 40 mm leveling screed on slab (or as required to achieve final levels), properly cured and moisture controlled. Provide skim-bed where required for bonding uniformity. Slope to drains shall be provided wherever wet cleaning or any floor wash is expected; ensure no ponding.
4.3 Installation: Fully bonded installation using polymer-modified tile adhesive suitable for vitrified/porcelain tiles; joints shall be flush and even. Grout shall be polymer-modified, stain-resistant and crack-resistant. Provide movement joints as per manufacturer recommendation and good practice. Provide edge trims/reducers at transitions and protect exposed tile edges.
4.4 Finish/palette guidance: Matte or low-sheen finishes only (avoid reflective glare). Recommended base palette: sand-beige/neutral greige with optional aqua-blue accent strip/inlay motif (ocean theme), subject to approval. Tile layout shall be symmetrical and aligned with major axes; cut tiles at edges shall be minimized.
4.5 QA/QC: Substrate level tolerance shall be <= 2 mm over 1 m and <= 3 mm over 3 m prior to laying. Hollow sound tiles are not acceptable; re-lay. Acceptance includes visual flatness, lippage within acceptable limits, and no cracked/chipped tiles at handover. Provide attic stock minimum 2 percent of installed quantity per tile type/colour.

5.0 FLOORING – CARPET TILES (WHERE USED)

5.1 Minimum system performance: Modular carpet tiles, 7-10 mm thick, heavy-commercial wear class (equivalent Class 33), suitable for high footfall. Carpet system (tile plus backing/underlay where used) shall contribute to acoustic absorption; submit NRC declaration not less than 0.8 for the carpet system (ASTM C423 or equivalent) or provide equivalent absorption declaration and demonstrate compliance with RT60 targets when combined with wall/ceiling treatments. Provide fire performance certificate for floor covering system (e.g., ASTM E648 Class I or equivalent) suitable for public interiors.
5.2 Anti-static: Where sensitive AV/IT equipment is used, provide anti-static carpet tiles or anti-static treatment with declared surface resistance suitable for public interiors; provide manufacturer declaration and maintenance guidance.
5.3 Finish/palette guidance: Neutral gray-beige base (non-distracting), with optional ocean-accent runner/wayfinding strip under aisles, subject to approval. Pattern direction shall be consistent as approved.
5.4 Installation: Glue-down using approved low-VOC adhesive/tackifier compatible with substrate and carpet backing. Seams shall be tight; no curling edges; transitions flush with adjacent flooring. Provide edge trims at thresholds. Provide neat cable management strategy to lecterns/exhibit points through floor boxes or routed channels without trip hazards.
5.5 QA/QC and spares: Provide sample tile and adhesive datasheet. Inspect for shading mismatch, gaps or adhesive bleed. Provide attic stock minimum 3 percent of installed tiles (minimum one full carton per colour/batch).

6.0 FLOORING – EPOXY/PU RESIN (SEAMLESS, WHERE USED)

6.1 Minimum system performance: Seamless epoxy or polyurethane resin floor system, 3-5 mm multi-coat build-up on smooth screed. Hardness >= 80 Shore D (after cure), slip resistance minimum DIN 51130 R9, chemical resistance suitable for routine cleaning agents, and abrasion loss <= 0.1 g (Taber abrasion; declare wheel/load/cycles). Finish shall be matte (no reflective gloss) to avoid glare on exhibits/screens.

6.2 Fire performance: Resin flooring system shall have flame spread performance suitable for public interiors, with test evidence such as BS 476 Part 7 Class 1 (or equivalent) and/or ASTM E648 compliance (or equivalent). Combustible underlayers are not permitted unless explicitly approved with fire evidence.
6.3 Finish/palette guidance: Indicative palette includes matte deep-teal base with sandy-beige inlay/demarcation zones (ocean motif), subject to approval. Demarcation shall be achieved by inlay/colour change within resin, not by surface tape markings.
6.4 Installation: Prepare substrate by grinding/shot blasting; ensure moisture content is within manufacturer limits. Apply primer, base coats and topcoat as per system. Seal edges and provide flush transitions at thresholds. Provide concealed floor outlets/floor boxes before resin pour, with sealed collars and removable covers.
6.5 QA/QC: Perform adhesion pull-off test (minimum 1.5 MPa on concrete or as per system requirement, whichever is higher) and hardness verification after cure. Verify level tolerance <= 2 mm over 1 m. Any pinholes, blisters, colour banding or debonding is not acceptable. Provide method statement and cure time plan to prevent damage during subsequent works.
7.0 SKIRTING, TRIMS, CORNER GUARDS AND CRASH RAILS
7.1 Skirting: Provide fire-retardant vinyl skirting minimum 100 mm height, minimum 2 mm thick, fixed on suitable backing where required. Skirting shall be bonded with approved contact adhesive and neatly sealed at top edge. Colour to match floor/wall as approved.
7.2 Trims and corner guards: Provide anodized aluminium trims/corner guards or equivalent robust protection at exposed corners and finish transitions. All exposed edges shall be protected; no sharp edges. Fixings shall be concealed where practicable and joints aligned.
7.3 Crash rails: Provide brushed stainless steel (Grade 304) crash rail at approximately 0.5 m height in high impact zones, minimum 19 mm OD or equivalent robust section with concealed brackets and continuous backing. Replace any dented or scratched rails.
7.4 Spares and maintenance: Provide spare trims/skirting minimum 2 percent and spare brackets/fasteners set. Provide cleaning and replacement instructions and ensure replaceability without damage to adjacent finishes.
8.0 WALL FINISHES - PAINTS, WALL FILMS, WALLPAPER (WHERE USED)
8.1 Paint system: Premium low-VOC paint system with surface preparation, primer and minimum two finish coats (additional as needed). VOC <= 50 g/L. Durability benchmark: minimum 1500 scrub cycles (ASTM D2486 or equivalent). Finish shall be matte/eggshell in screen/exhibit viewing zones to reduce glare; satin only where enhanced washability is required.
8.2 Wall films/graphics: Vinyl graphics shall be UV-stable, laminated (minimum 0.1 mm protective laminate), matte anti-glare and cleanable. Pattern alignment shall be maintained; no bubbles, wrinkles or edge peel. Adhesives shall be low-odour and compatible with the paint/substrate.
8.3 Wallpaper and specialty wall coverings: Where used, thickness 0.6-1.0 mm, stain-resistant, and fire-retardant with suitable flame spread certificate. Provide edge sealing and corner protection strategy for high traffic areas.
8.4 Palette guidance: Base walls off-white/light gray; accent walls deep sea-blue/coral accents for identity and wayfinding, subject to approval via sample and on-wall trial patch or as per the approved design.
8.5 QA/QC: Provide colour samples, paint film uniformity check, and adhesion tape test for films. No roller marks, patchiness, cracking, chalking or peeling accepted at handover.
9.0 WALL CLADDING - HPL/COMPACT LAMINATE ON SUBSTRATE (WHERE USED)
9.1 System: HPL or compact laminate wall cladding suitable for high-touch public interiors, mounted on stable substrate with concealed mechanical fixing and/or approved adhesive plus mechanical restraint. Provide sub-frame/battens where required to achieve flatness and accommodate services.
9.2 Performance: HPL/compact laminate shall comply with EN 438 (or equivalent) for abrasion, scratch and impact resistance. Compact laminate thickness typically 6-12 mm. For HPL sheet systems, minimum 0.8-1.0 mm HPL bonded to FR/MR substrate with sealed edges/lippings. Provide fire performance certificate suitable for interior wall lining and declaration of surface spread of flame and smoke development.
9.3 Workmanship: Panels shall be true and aligned; joints uniform; edges protected; corners finished with robust profiles. Provide removable panels/access hatches where services require access; access panels shall match surrounding finish.
9.4 QA/QC: Submit samples, edge detail, fixing method statement and fire certificate. Acceptance includes no delamination/oil-canning, no sharp edges, and consistent alignment.
10.0 ACOUSTIC WALL PANELS AND TREATMENTS (WHERE USED)

10.1 System performance: Fabric-wrapped acoustic panels or perforated panels with acoustic infill, NRC >= 0.7 (tested). Panel thickness 25-50 mm (or as designed) mounted on damping strips/resilient channels to reduce vibration and rattling.
10.2 Fire and hygiene: Fabrics shall be durable, stain-resistant and fire-retardant with test certificate (ASTM E84 Class B or equivalent). Acoustic infill shall be non-combustible mineral wool and faced to prevent fibre shedding.
10.3 Acoustic targets: Combined treatment shall support RT60 targets and control flutter echo. Provide neat cut-outs for speakers/control devices and sealed edges to prevent dust ingress.
10.4 QA/QC: Provide one installed sample for approval. Acceptance includes uniform appearance, no sagging or rattling, and submission of acoustic performance declarations.

11.0 SIGNAGE, WAYFINDING AND INTERPRETATION

11.1 Interpretive panels: Aluminium frame with UV-protected print, matte anti-glare lamination, and non-glare acrylic face where required. Minimum readable text size 18 pt for main body copy unless otherwise approved. Indicative build-up: 4 mm ACP/ACM backer + 3 mm acrylic face with sealed edges.
11.2 Installation and accessibility: Mounting heights and contrast shall follow applicable accessibility norms and good practice. Provide braille/tactile where required. Provide standoff mounting 15-30 mm from wall with hidden fasteners or tamper-resistant screws. No sharp edges.
11.3 Exit and statutory signage: Provide LED exit signs and evacuation maps with standard colours/symbols. Exit sign LED life >= 50,000 h. Provide photoluminescent elements where required and ensure visibility during blackout.
11.4 QA/QC: Submit artwork proofs and one installed sample for review. Verify legibility and glare in actual lighting conditions. Provide agreed spares for future replacement.

12.0 PARTITIONS, GLAZING AND DOORS (INCLUDING FIRE/ACOUSTIC WHERE REQUIRED)

12.1 Stud partitions: Gypsum board partitions on galvanized steel stud framing. Studs and tracks minimum 0.55 mm thickness (or heavier as required for height), properly anchored to resist impact. Typical build-up: >= 100 mm overall with insulation. Minimum sound insulation benchmark: STC >= 45 for shared walls; STC >= 50 for immersive/quiet rooms where required. Deflection limit: L/240 maximum and no perceptible wobble; partitions shall resist a 50 N lateral load without movement.
12.2 Fire-rated assemblies: Where required, provide tested fire-rated partition and door assemblies (minimum 60 minutes or as required) with intumescent/smoke seals and fire-stopping at penetrations. Certificates shall be provided for the complete assembly and installed as tested.
12.3 Doors and hardware: Solid core doors minimum 45 mm thick (or FR door as required) with commercial-grade SS304 hinges, closers (EN 1154 or equivalent), lever handles (accessible), mortise locks and door stops. Fire exit doors shall include panic hardware where required and statutory signage. Provide acoustic drop seals for acoustic-rated doors.
12.4 Glazing: Safety glazing shall be toughened/laminated (e.g., 8.8 mm laminated or 10-12 mm toughened as appropriate) with polished edges, correct gaskets and manifestations at eye level to prevent collision. Use acoustic interlayer glazing where acoustic separation is needed.
12.5 QA/QC: Provide partition/door mock-up showing finish, corner protection and seal details. Verify plumb/level, door operation, alignment and sealing. Fire-stop and acoustic sealant continuity shall be inspected prior to concealment.

13.0 CEILING SYSTEMS (ACOUSTIC CLOUDS/PANELS/SPRAYED ACOUSTIC WHERE USED)

13.1 Acoustic ceiling benchmark: Acoustic clouds/panels and/or sprayed acoustic plaster as specified to damp crowd noise. Minimum NRC >= 0.8 for acoustic ceiling elements, with suitable fire performance (Class A or equivalent test evidence). Panels typically 40-50 mm thick mounted on suspension grid. Provide service access panels and coordinate with lighting/HVAC/projector mounts.
13.2 Workmanship and tolerances: Ceiling surfaces shall be clean and dust-free. Alignment shall be neat; tolerance: level within +/- 2 mm over 3 m, and no visible sagging or misaligned edges. Exposed grid/edges shall be straight and uniform.
13.3 Mock-ups: Provide a ceiling mock-up bay showing suspension, acoustic panel, access panel, one luminaire, one diffuser and one speaker opening (if applicable) for approval before bulk execution.

14.0 CABLE RACEWAYS, TRUNKING, CONDUITS AND FLOOR BOXES

14.1 Containment: Perforated GI cable trays/ladder trays with minimum 1.5 mm steel thickness and load rating >= 50 kg/m, with supports at <= 1.5 m spacing. Conduits/trunking heavy-duty and compliant with IS 9537 or equivalent. Metallic containment shall be bonded/ earthed.

14.2 Segregation and routing: Maintain >= 300 mm separation between power and data/ELV routes or provide physical segregation. Cable fill <= 50 percent. Provide sleeves, grommets and fire-stopping at penetrations.
14.3 Acceptance: Verify tray earth continuity, fastener tightness and absence of sharp edges. Provide corrosion protection in humid locations and maintenance plan for periodic inspection.
15.0 ELECTRICAL – OUTLETS, DBs, CIRCUITS, EARTHING AND TESTING
15.1 Supply origin: All raw power and UPS-backed feeds for the Centre shall be tapped from the Ground Floor Electrical Panels Room. Contractor shall provide new feeders/raceways/risers/cabling/distributions and complete terminations as required, in coordination with INCOIS. No temporary/unsafe tapping shall be permitted.
15.2 Outlets and circuits: Provide 230 V normal and UPS outlets as per equipment schedule and layout. Provide 10A/16A general outlets and 20A/32A dedicated outlets for high-load AV/projectors where required. Provide dedicated circuits for AV racks and show control points. Socket circuits shall be protected with RCCB/RCBO (30 mA). Segregate normal and UPS circuits with clear colour-coding and labelling at DBs and outlets (e.g., blue for UPS).
15.3 Wiring and materials: Copper conductors FRLS/LSZH as required complying with IS 694 / IS 1554. Minimum conductor sizes as a benchmark: 1.5 sqmm for lighting, 2.5 sqmm for general sockets, and 4 sqmm (or as per load) for higher loads; feeder sizes as per load calculations. Provide balanced three-phase loading where applicable and minimum 20 percent spare capacity for future expansion.
15.4 Distribution boards: DBs shall be metal, lockable, IP54 minimum, sized with 20 percent spare ways, and fitted with appropriately rated MCBs/RCBOs. Provide circuit schedules, engraved labels and clear segregation between UPS and normal sections. Provide surge protection for sensitive electronics where required.
15.5 Earthing and bonding: Earthing shall follow IS 3043. Bond all metallic trays, racks, equipment frames and DBs. Earth resistance at point of utilization shall be <= 2 ohm wherever achievable; in any case, not worse than the existing building earthing performance. Provide isolated/clean earth for AV/IT racks where required.
15.6 Testing and certification: Perform insulation resistance, continuity, polarity, earth loop impedance and RCD trip tests; submit results. Provide an electrical installation completion certificate signed by a licensed electrical contractor. Any overheating, loose terminations or unlabeled circuits are not acceptable.
16.0 LIGHTING – FIXTURES, LEVELS, CONTROLS, EMERGENCY LIGHTING
16.1 Performance: LED luminaires with rated life >= 50,000 h (L70), driver PF >= 0.9, CRI >= 90 for exhibit lighting, and flicker-free dimming. Ambient illuminance benchmark approximately 300 lux in public areas; teaching/task areas 300-500 lux; exhibit accents up to ~300 lux where required, with glare control.
16.2 Colour temperature: Typical range 3500K-4000K for general lighting, with controlled accent/tunable white (3000K-6000K) and/or RGBW effects where specified for immersion. Avoid CCT variation within one visual field. Provide glare control accessories as required.
16.3 Controls: Scene-based dimming with minimum 4 preset scenes and integration capability with AV shows where required. Use DALI/DMX (with RDM where applicable) or equivalent. Provide commissioning, addressing, scene programming and operator training.
16.4 Emergency and exit lighting: Provide emergency luminaires and exit signs on egress paths with minimum 2 h backup (or as required by authority). Emergency function shall be tested during blackout and recorded. Exit signs shall remain clearly visible and compliant with statutory norms.
16.0.5 Testing: Lux level measurements and uniformity checks shall be conducted and documented. Verify emergency auto-on, battery duration, and scene programming acceptance demonstration.
17.0 HVAC MODIFICATIONS AND COORDINATION
17.1 Scope: Modify existing HVAC distribution as required due to interior layout changes, including duct rerouting/branching, additional/relocated diffusers/grilles, balancing dampers and attenuators where required. Maintain comfortable conditions (indicative: 24 +/- 2 degC and 50-60 percent RH) without objectionable drafts (indicative max 0.25 m/s) and noise (<= 40 dB(A) in galleries).
17.2 Fresh air and returns: Maintain return air pathways and provide fresh air provisions as per code and good practice. Enclosed rooms shall have appropriate return/transfer provisions to avoid pressure issues.
17.3 Testing: Provide air balancing report and demonstrate performance after modifications. Rectify any leaks, vibration, whistling or comfort complaints under warranty.
18.0 NETWORKING AND AV INFRASTRUCTURE (STRUCTURED CABLING, RACKS, Wi-Fi)

18.1 Cabling: Cat 6A horizontal cabling to all exhibit/AV/control points (10 Gbps capable) and fibre backbone (OM4 multimode or singlemode as required) where needed for high bandwidth. Cabling shall comply with ISO/IEC 11801 and ANSI/TIA-568. Segregate ELV pathways from power by >= 300 mm or provide physical segregation. Use FRLS as minimum and LSZH/plenum-rated where required.
18.2 Racks and terminations: Provide 19-inch rack(s) with cable management, ventilation, earthing and lockable doors. Provide patch panels and outlets with 20 percent spare capacity. Provide rack grounding (minimum 4 sqmm earth to nearest earth bus).
18.3 Testing and labelling: Label all outlets and both ends of cables with unique IDs. Test each Cat 6A permanent link with calibrated tester and submit certification reports. Test fibre insertion loss (and OTDR where required). Provide as-built rack layout, cable schedules and logical labelling scheme.
18.4 Wi-Fi readiness: Provide data outlets and PoE provisions for ceiling-mounted Wi-Fi APs as per coverage design and expected visitor load.

19.0 PUBLIC ADDRESS (PA) AND VOICE ALARM / EVACUATION (PAVA) SYSTEM

19.1 General PA: Multi-zone 100V line PA system for paging and curated audio. Design for even coverage (<= 3 dB variation within zone) and speech intelligibility STI >= 0.5. Provide zoning, paging microphone, and override functions.
19.2 PAVA / voice evacuation (where required by NBC/Fire NOC): Provide a voice alarm/evacuation capable system integrated with the fire alarm system. VACIE/voice alarm controller shall comply with EN 54-16 (or equivalent) and monitored power supplies EN 54-4 (or equivalent). Voice evacuation loudspeakers shall comply with EN 54-24 (or equivalent). Provide supervised lines, fault monitoring, emergency microphone, and pre-recorded evacuation messages (English/Hindi or as directed). Provide interface with fire alarm for automatic override and zoning.
19.3 Backup power: Provide standby power sized for minimum 24 h standby plus 30 min alarm operation (or as required by authority) with automatic charging and health monitoring. Provide UPS-backed supply for critical paging as required.
19.4 Cabling and installation: Use FRLS/LSZH speaker cables routed in dedicated ELV containment and segregated from power. Speakers shall be securely mounted (ceiling or surface), grilles flush, and wiring concealed. Provide rack wiring diagrams and neat terminations.
19.5 Testing and maintenance: Demonstrate paging in each zone, zoning logic, fault indications (for PAVA), and SPL/intelligibility verification. Provide preventive maintenance schedule (minimum quarterly checks) and spares (minimum one spare speaker per type or 2 percent, whichever higher; and critical spares as recommended).

20.0 CCTV VIDEO SURVEILLANCE, ACCESS CONTROL AND SECURITY INTEGRATION

20.1 IP cameras: Minimum 4MP IP cameras, H.265/H.265+ capable, day/night with IR, true WDR (minimum 120 dB declared or equivalent), PoE, and ONVIF Profile S compliant (Profile T preferred). Public area domes shall be vandal-resistant (IK10 preferred). Provide IP66/IP67 where environmental exposure exists. Lens selection (fixed or varifocal 2.8-12 mm) shall suit coverage. Provide secure access features (unique passwords, HTTPS/TLS, role-based users) and basic analytics.
20.2 NVR and storage: NVR sized for installed cameras plus minimum 25 percent spare channel capacity, supporting H.265 recording, minimum 4 HDD bays, RAID support (minimum RAID-1), dual NIC, HDMI output and audit logs. Storage shall be sized to provide minimum 45 days retention at configured resolution and frame rate (minimum 15 fps for general areas) on 24x7 recording. Submit storage sizing calculation and provide surveillance-grade HDDs rated for 24x7 use.
20.3 Cabling and integration: Provide Cat 6/Cat 6A cabling in dedicated ELV pathways with labelling and testing. Provide time synchronization (NTP), proper network segregation/VLAN where required, and earthing/bonding of metallic mounts and trays.
20.4 Access control readiness: Provide conduits/cabling for readers and locks where required, with provision for secure RFID (e.g., MIFARE) and fire alarm interface for emergency release where required.
20.0.5 Testing: Demonstrate each camera view, focus, IR performance, recording/playback and time synchronization. Provide evidence of retention configuration. Hand over as-built camera list, IP plan, admin credential handover procedure and training.

21.0 FIRE AND LIFE SAFETY INTEGRATION (COORDINATION, DEVICES, EXIT SYSTEMS)

21.1 Coordination: Coordinate with existing fire detection/suppression systems for any device relocation due to ceilings/partitions. Maintain code-required spacing, accessibility and visibility. All works shall be done in coordination with authorized fire system vendor and as per Fire NOC.

21.2 Fire/PA cabling survivability: Cables for fire alarm and voice evacuation circuits shall be routed in metal conduits or physically segregated/protected as required by authority and good practice. All penetrations shall be fire-stopped with approved systems.
21.3 Emergency signage and lighting: Provide exit signage and emergency lighting as per NBC/Fire NOC and test during blackout conditions. Provide evacuation maps at key decision points and ensure visibility and legibility.

22.0 EXHIBIT PLATFORMS, PEDESTALS, MOUNTING HARDWARE AND SAFETY

22.1 Structural supports: Provide engineered mounting hardware and structural supports for video walls, projectors, screens, kiosks, interactive devices and heavy physical models. Do not anchor heavy loads to gypsum board alone; provide backing/reinforcement to structure. Provide secondary safety cables for overhead items and anti-tip anchoring for racks and tall elements.
22.2 Load benchmarks: Floor-based platforms/pedestals (where provided) shall be designed for high public loading; indicative minimum live load 500 kg/m² unless design dictates higher. Provide rounded edges, anti-slip surfaces and no trip hazards. Provide concealed access for cabling and ventilation for heat loads.
22.3 QA/QC: Provide a fastener/anchor schedule and demonstrate pull-out capacities where required. Provide safe maintenance access strategy for mounted equipment (service hatches, access panels).

23.0 DOCUMENTATION, AS-BUILTS, SPARES, WARRANTY AND MAINTENANCE

23.1 Documentation: Provide as-built drawings (CAD + PDF) for architectural, electrical and ELV routes, DB schedules, cable schedules, rack layouts, IP plans, lighting addressing and scene list, PA/PAVA zone diagrams, test reports and commissioning sheets. Provide O&M manuals and cleaning/maintenance guidance for each finish.
23.2 Spares/attic stock: Provide attic stock/spares for finishes and maintainable items: minimum 2-5 percent for tiles/carpet/acoustic elements/skirting/trims; touch-up paint per colour; spare signage prints/panels as agreed; and critical spares for ELV systems (patch cords, spare speaker(s), spare drivers as applicable). All spares shall be from same batch/lot where relevant.
23.3 Warranty and AMC obligations: Provide comprehensive warranty for all interiors and interior-integrated systems for the period stated in the tender (minimum not less than 12 months for workmanship and not less than 24 months for ELV/controls, unless the tender specifies higher). Manufacturer warranties shall be passed through. Provide preventive maintenance obligations during warranty/AMC including quarterly checks for PA/PAVA, annual checks of lighting controls and emergency lighting batteries, inspection of cable trays/anchors, and tightening/re-tensioning of mounted exhibits.

24.0 REFERENCE STANDARDS (INDICATIVE – LATEST EDITIONS SHALL APPLY)

24.1 NBC 2016 – National Building Code of India (including Part 4 Fire & Life Safety).
24.2 IS 15622 – Pressed ceramic tiles (BIS). Product Manual (official): https://bis.gov.in/wp-content/uploads/2019/09/PM_IS_15622.pdf
24.3 IS 3043 – Code of practice for earthing.
24.4 ISO/IEC 11801 – Generic cabling for customer premises (ISO official): https://www.iso.org/standard/66182.html
24.5 EN 54 series for voice alarm/evacuation (EN 54-16, EN 54-4, EN 54-24) or equivalent.
24.6 ONVIF Profile S (official): https://www.onvif.org/profiles/profile-s/
24.7 IEC 62676 series – Video surveillance systems for use in security applications (IEC webstore): https://webstore.iec.ch/en/publication/62442

25.0 SUBMITTALS & APPROVALS CHECKLIST (MANDATORY FOR BIDDERS/CONTRACTOR)

25.1 Detailed layouts and shop drawings: Submit coordinated shop drawings for architectural layouts, partitions, reflected ceiling plans, flooring patterns, joinery, signage and integrated services (lighting, HVAC diffusers, sprinklers/detectors if any, speakers, CCTV, Wi-Fi APs, projectors and mounts). Drawings shall include fixing details/brackets for exhibits and equipment. No related work shall commence without written approval.
25.2 Material and finish schedule: Submit a complete material/finish schedule (surface-wise and area-wise) listing proposed make/model, technical specifications, colour/finish codes, and declared fire/acoustic ratings as applicable. No finishing materials shall be procured or applied without approval.
25.3 Samples and sample boards: Provide physical sample boards for approval including paint swatches, flooring (tile/carpet/resin chip), wall films/graphics, acoustic panel fabric,

laminate/cladding, trims/corner guards, a typical light fixture, diffuser/grille sample and any other requested hardware. Approval of samples shall lock aesthetics and quality before bulk procurement.
25.4 Mock-up installations: Execute on-site mock-ups for critical assemblies (typical wall section with skirting/corner guard and one graphic panel; one ceiling bay with luminaire/diffuser/speaker/access; and one flooring transition integrating all floor types and floor-box detail). Mock-ups shall serve as quality benchmark. Written approval is mandatory before full-scale work.
25.5 MEP/ELV coordination drawings: Submit coordination drawings reflecting integration of Mechanical, Electrical, IT/AV and low-voltage systems with interiors, including ceiling void coordination, exact positions for floor outlets/floor boxes, builder's work openings and service access. Approvals from relevant discipline representatives shall be obtained before closing-up.
25.6 Compliance certificates: Submit datasheets and valid test certificates for all relevant materials prior to installation, including fire resistance certificates for doors/fabrics/carpets, acoustic NRC/STC reports for acoustic materials, FRLS/LSZH declarations for cables, floor slip resistance test data, VOC compliance for paints/adhesives, and any statutory certificates required. Material approval is contingent on evidence of compliance.
25.7 Work method statements: For specialized works (e.g., epoxy/PU resin flooring, heavy mounting, ceiling suspension, PAVA integration), submit method statements describing process steps, safety measures, QA checks and hold points. Obtain approval before execution.
25.8 Stage-wise inspections and approvals: Facilitate inspections at key hold points including (a) substrate preparation, (b) framing before boarding/closing ceilings, (c) first coat/colour trial, (d) pre-commissioning of MEP/ELV systems, and (e) final snag and handover. The programme shall include these inspection milestones.
25.9 As-built drawings and documentation: Submit as-built drawings for interiors and services, O&M manuals for finishes and systems, warranty certificates, inventory of spares/attic stock handed over, test/commissioning reports and training records prior to final handover/payment.
25.10 Spare materials (attic stock): Explicitly include spare materials typically 2-5 percent of installed quantities (tiles, carpet tiles, laminate/cladding sheets where feasible, acoustic panels, skirting/trims, touch-up paint, spare signage skins). Spares shall be of the same batch/lot where relevant and shall be verified at project close.
25.11 Structured cabling and low-voltage test reports: Submit complete labelling scheme, Fluke certification reports for all Cat 6A links, fibre loss/OTDR reports where applicable, PA zone and speaker line test reports, CCTV camera list and retention sizing, and rack layout/wiring diagrams as part of commissioning and handover.

26.Fire-Rated Exit Door Upgradation (Existing Doors to be Removed and Replaced) Scope of Work (Mandatory)
The Contractor shall remove and dispose the existing double-leaf flush doors and frames (approx. 1800 mm clear width) at the identified entry/exit openings, including all existing hinges, locks, bolts, closers, stoppers, glazing (if any), and associated accessories. The Contractor shall supply, install, test and commission new certified fire-rated double-leaf exit door sets complete with tested frame + shutter(s) + hardware as one approved assembly, including all necessary civil making-good, patch plastering, surface finishing, fire stopping, seals, signage, and final painting to achieve a complete, code-compliant, visitor-ready installation. Any temporary door/barricading required for safety and building security during replacement shall be included.
Fire Rating and Compliance
Provide minimum 120-minute fire resistance (or minimum 60-minute if directed/approved by the competent fire authority/INCOIS; however bidder shall quote considering 120 minutes as base requirement). Door sets shall comply with NBC 2016 fire & life safety provisions and be type-tested by a NABL-accredited / recognized laboratory as a complete assembly. Fire rating test shall be in accordance with IS 3614 (Part 2) / IS 3614 (Part 1) (latest) or equivalent BS 476 Part 22 / EN 1634-1 / UL 10C (any one accepted) with valid test certificate(s). The test certificate shall clearly indicate the door shutter construction, frame type, hardware compatibility, seals, glazing (if any), and rating duration.
Door Construction (Minimum)

- **Door Type:** Double-leaf fire-rated steel door set (preferred for high footfall) or fire-rated composite/flush door set only if fully type-tested with matching frame and hardware.
- **Shutter Thickness:Minimum 50–60 mm thick shutter.**

- **Steel Shutter Skin:** Minimum 0.9 mm GI (each face) with internal stiffeners and fire-resistant infill (honeycomb/mineral core as per tested assembly).
- **Frame:** Pressed steel frame minimum 1.6 mm thick, with integral rebate suitable for smoke seals and hardware; frame to be fully anchored to wall with approved anchors/holdfasts.
- **Leaf Size & Clear Opening:** Maintain existing opening and provide maximum possible clear egress width; no reduction beyond what is unavoidable due to certified frame system.
- **Finish:** Factory powder-coated or site enamel over approved primer, matte/low-sheen, colour as per approved palette (neutral grey/white). No sharp edges; corners rounded where feasible.

Hardware & Accessories (All to be Fire-Door Rated/Compatible)

Provide only hardware that is listed/approved for use on the rated door assembly as per manufacturer/test report.

1. **Panic Exit Device:** Each leaf shall be provided with panic bar / touch bar (EN 1125 or equivalent) suitable for emergency egress. Configuration (rim/vertical rod) shall suit double-leaf operation and door height.
2. **Door Closers:** Heavy-duty door closers (EN 1154 or equivalent) sized to door leaf width/weight. Provide door coordinator for double-leaf so inactive leaf closes first.
3. **Hinges:** Minimum 3 heavy-duty SS 304 ball-bearing hinges per leaf (or as per manufacturer's tested configuration).
4. **Bolts & Latching:** Provide top and bottom flush bolts for inactive leaf (if required) compatible with panic hardware; no manual padlock arrangements on escape route doors.
5. **Fire/Smoke Seals:** Provide intumescent strip and cold-smoke seals continuously around frame/leaf, including meeting stile.
6. **Automatic Drop Seal:** Provide automatic drop seal at bottom of each leaf where required to limit smoke/light leakage (as per tested assembly).
7. **Vision Panel (If Required by Code/INCOIS):** Only if permitted by test certification; glazing shall be fire-rated glass with matching beading system tested for the same rating.
8. **Door Stopper:** Concealed or floor stopper compatible with egress and door closer operation; must not impede panic opening.

Installation, Civil Making-Good and Fire-Stopping

1. Carefully remove existing frame without damaging surrounding structure beyond workable limits.
2. Repair jambs/sill/soffit, restore plumb and true lines, and finish surfaces to match adjacent wall finishes.
3. Frame installation shall be plumb/level; fix using approved anchors/holdfasts at manufacturer-recommended spacing; pack voids with fire-rated mortar/foam as per certification.
4. All perimeter gaps and penetrations shall be fire-stopped using approved fire sealant/systems maintaining door assembly integrity.
5. Floor level difference at threshold shall be minimized; no trip hazards; ensure accessibility and smooth trolley movement.

Signage and Identification (Mandatory)

Provide and fix durable signage on both sides:

- **"FIRE EXIT – KEEP CLEAR"** and/or **"PUSH BAR TO OPEN"** as applicable.
- **"FIRE DOOR – KEEP SHUT"** where required.
- Directional exit sign coordination with emergency lighting/exit signage system. All signage shall comply with **NBC/ISO 7010** pictograms and be in high-contrast, photo-luminescent where specified.

Testing, Commissioning and Acceptance

1. Functional testing of panic devices, closers, coordinator, latching and self-closing. Door shall self-close and latch reliably from any open position.
2. Check clear opening, smooth operation, and no scraping.
3. Verify continuity and completeness of smoke seals; verify no visible light leakage at perimeter in closed position (indicative of poor sealing), subject to acceptable door tolerances.
4. Submit as-built installation photographs, hardware list, and commissioning checklist signed by installer and site engineer.

Submittals (With Technical Bid / Before Procurement)

- Manufacturer datasheets for door, frame, hardware and seals.

- Type-test certificate(s) for the complete door set (rating duration, standard used, scope).
- Installation manual and recommended maintenance plan.
- Warranty certificates and spares list.

ANNEXURE-IX

Bank Guarantee Format for Performance Security
To

The Director
Indian National Centre for Ocean Information Services (INCOIS)
Oceanvally, Pragathi Nagar (BO), Nizampet (SO)
Pragathi Nagar
Hyderabad-500 090

Whereas..... (name and address of the contractor) (hereinafter called "the contractor") has undertaken, in pursuance of contract no ..... date..... to supply ..... (Description of goods and Works/ Services) (hereinafter called "the contract").
And whereas you have stipulated it in the said contract that the contractor shall furnish you with a bank guarantee by a Commercial bank for the sum specified therein as security for compliance with its obligations as perthe contract.
And, whereas we have agreed to give the contractor such a bank guarantee.
Now Therefore we hereby affirm that we are guarantors and responsible to you, on behalf of the contractor, up to a total of .....(amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the contractor to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.
We hereby waive the necessity of your demanding the sail debt from the contractor before presenting us with demand.We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition, or modification.

This guarantee shall be valid until the .....day of .....20.....

Our.....branch at.....*(Name & Address of the .....*(branch) is liable to pay the guaranteed amount depending on the filing of a claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our .....* branch a written claim or demand and received by us at our .....* branch on or before Dt..... Otherwise, the bank shall be discharged of all liabilities under this guarantee after that.

(Signature of the authorized officer of the Bank)

.....
.....
Name and designation of the officer
.....
Seal, name & address of the Bank and address of Branch

*Preferably at the headquarters of the authority competent to sanction the expenditure for the procurement of goods or at the concerned district headquarters or the state headquarters.

ANNEXURE-X

Clarifications Format

To

Shri V Subrahmanyam, Purchase Officer, INCOIS
email: manyam@incois.gov.in
Tel: 040-23886022

S.No.	Page No. &Clause No.	Tender document Statement	Your Statement	Justification for Changing the Statement

Send the clarifications by the due date mentioned in the Tender document.