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INLAND WATERWAYS AUTHORITY OF INDIA

(Ministry of Ports, Shipping and Waterways, Govt. of India)

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23.09.2026

To,

All Shipyards

(As per circulation list)

Subject: Request for inputs of shipyards on Technical Specification of 20 Pax Electric Passenger Boats for Operation at Ghats in Cities on National Waterways and its budgetary cost -reg.

Sir/Madam,

The Inland Waterways Authority of India (IWAI) is endeavouring to introduce 20-Pax electric passenger boats at the Ghats of cities on National Waterways. Towards this, a technical specification for a 10-metre, 20-passenger, fully electric passenger boat has been prepared, enclosed as Annexure to this letter.

2. You are requested to review the enclosed technical specification and to furnish your **assessment of technical feasibility, any modifications suggested on technical or cost grounds, and budgetary estimate against the cost heads given there in the Annexure.**
3. This letter and its Annexure are issued solely to obtain technical and indicative commercial inputs only.
4. Responses may kindly be submitted electronically to lkrajak@iwai.gov.in and vpandey@iwai.gov.in on or before **05th October 2026.**

This issues with the approval of the Competent Authority.

Encl.: Technical Specification (Annexure)

Yours faithfully,


(L. K. Rajak)
Chief Engineer (Technical)

Copy for favour of information to:

1. Dr. K. K. Nath, Advisor Statistics (IWT-I & II, TRW), MoPSW.
2. PPS/Chairman, PS/Vice Chairman, PS/Member (Technical), IWAI, Noida.

TECHNICAL SPECIFICATION AND PROBLEM STATEMENT FOR DESIGN, CONSTRUCTION AND SUPPLY OF 20 PAX ELECTRIC PASSENGER BOATS FOR OPERATION AT GHATS IN CITIES ON NATIONAL WATERWAYS-1 (GANGA-BHAGIRATHI-HOOGHLY RIVER SYSTEM) AND VARIOUS OTHER NATIONAL WATERWAYS

1. Background

1.1. The Inland Waterways Authority of India (IWAI) is endeavouring to introduce 20-Pax electric passenger boats at the ghats of cities on National Waterways-1 (Ganga-Bhagirathi-Hooghly River System) and various other National Waterways, which called for optimisation and examination of component-wise manufacturing cost of vessels.

1.2. In this context, a concept design of a 10-metre fully electric passenger boat, suitable for 20 passengers and 2–3 crew, is being developed for gentle river conditions (current of 0.5 m/s). This document sets out a consolidated requirement, for circulation to shipyards to assess technical feasibility, indicative pricing and construction capability prior to detailed design and procurement.

1.3. The technical particulars at Sections 4 onward have been aligned to the 20 Pax Fully Electric Catamaran Vessel design developed by the India Ship Technology Centre (ISTC) in association with IWAI, furnished as a reference design for shipyard evaluation (placed as Annexure-1). This is a concept-stage document intended to seek shipyard feedback. Nothing in this document confers any commitment, financial or otherwise, on IWAI.

2. Requirements

2.1. Existing passenger boats operating at the ghats of various tourist locations/cities are predominantly diesel-powered, resulting in air and noise pollution on stretches of river that carry heavy religious, tourist and ceremonial significance, and recurring fuel expenditure.

2.2. IWAI requires a purpose-built, shallow-draft, zero-emission electric passenger boat that can operate reliably within gentle river conditions.

2.3. The core design requirement is to construct the vessel within a cost ceiling of ₹2 to 2.5 crore per vessel duly fulfilling following requirements:

- (a) adequate passenger and crew capacity (20 pax+ 3 crew) and comfort;
- (b) shallow draft and low wake;
- (c) sufficient battery reserve and propulsion redundancy to complete a defined duty cycle (three round trips of around 10 km each with not less than 20% battery reserve) for 10 months (except in monsoon/flood conditions);
- (d) compliance with applicable inland vessel safety, stability and construction regulations; and

2.4. Shipyards are accordingly requested to review the technical specification at Section 4 onward and to furnish their assessment of construction feasibility, any suggested modifications on technical or cost grounds, and an indicative quotation, as detailed at Section 12.

3. Objective and Scope

3.1. To finalise, through shipyard consultation, a build-ready technical configuration for the electric passenger boat and to identify shipyards capable of undertaking detailed design, construction, testing, certification and delivery of the vessel(s) within the stated cost envelope.

3.2. The scope covers design and construction of the hull and superstructure, propulsion and battery/charging systems, electrical architecture, passenger accommodation, and navigation/safety systems, together with classification/certification, river trials and commissioning, as elaborated in the sections below.

4. Principal Particulars

The vessel shall conform to the following principal dimensions and general particulars, aligned to the reference catamaran design:

Parameter	Specification
Length overall (LOA)	9.8 m
Breadth (max)	4.5 m
Breadth (demi-hull)	1.1 m
Depth	1.2 m
Loaded draft	0.6 m
Speed	Up to 7 knots
Vessel category	Category C
Passenger capacity	20 Nos., plus 2-3 crew
Passenger space	Non-AC, with wall-mounted fans
Hull & superstructure material	Aluminium
Hull form	Catamaran (twin demi-hull), aluminium
Aluminium weight	1.8 tonnes
Lightweight (lightship)	4.0 tonnes
Roof deck	Aluminium truss type, integrating solar canopy

5. Design Philosophy, Hull Form and Structure

5.1. The vessel shall be a catamaran (twin demi-hull) configuration designed for gentle river conditions (current ~0.5 m/s), optimised for low resistance, low wake, shallow draft, good stability and low propulsion power, at a maximum speed of up to 7 knots.

5.2 Hull form

- Catamaran hull comprising two slender demi-hulls (demi-hull breadth ~1.1 m) joined by a common cross-structure, giving an overall beam of ~4.5 m.
- Hull form optimised for shallow draft (0.6 m loaded) and low wake generation, suited to ghat operations.

5.3 Structure and material

- Aluminium hull and superstructure throughout; aluminium weight ~1.8 tonnes; lightship displacement ~4.0 tonnes.
- Non-skid aluminium deck.

- Roof deck of aluminium truss construction, doubling as the mounting structure for the solar canopy (Section 9.3) and walkway at mid portion for sight-seeing.
- Open-sided profile for natural cross ventilation and low structural weight.

6. Passenger Accommodation and Layout

6.1. The passenger deck shall be open, non-air-conditioned, and fitted with wall-mounted fans, laid out for passenger ergonomics and panoramic river views.

6.2. The aluminium truss roof deck shall provide shade over the passenger area and shall integrate the solar canopy(optional) (Section 9.3), with a retractable/roll-up side curtain provided for monsoon conditions.

6.3. Comfort features shall include marine cushioned seating, non-skid deck surfaces, grab rails and boarding handrails, low operating noise and vibration, and adequate lighting.

7. Propulsion System

7.1. Twin electric outboard motors are specified in preference to a single unit, in order to provide propulsion redundancy, independent propulsion channels, better manoeuvrability and docking control, a return-to-shore capability in the event of failure of one motor, better control in river currents, and easier maintenance.

Parameter	Specification
Configuration	2 × electric outboard motors (one per demi-hull)
Rating (each)	15 bhp (≈ 11 kW), reference design; tentative
Propeller	Matched to each motor; independent channels

7.2. One 15 bhp Petrol OBM(optional) for auxiliary/emergency power.

8. Battery System

8.1. The reference design specifies a 65-kWh nominal LFP (lithium iron phosphate) battery with active thermal management (1-tonne split-AC cooling), sized to cover the defined duty cycle together with reserve for battery degradation over service life and unplanned additional trips.

Parameter	Specification
Chemistry	Lithium Iron Phosphate (LFP)
Nominal capacity	65 kWh
Battery cooling	1-tonne split-AC (active cooling)
BMS	Dual-level intelligent BMS with individual cell monitoring, mandatory thermal monitoring, CAN communication, emergency isolation
Enclosure protection	IP67

Shipyards may propose an alternative battery configuration (capacity, voltage, cooling strategy) with technical justification, provided the route performance requirement at Section 10 and the cost ceiling at Section 12 are met.

9. Charging, Electrical Architecture and Solar Power

9.1. Charging architecture (onboard AC charger rating, number of chargers, shore-charging arrangement) shall be proposed by the shipyard, sized to the 65 kWh battery and the vessel's duty cycle, for IWAI's review.

9.2. The high-voltage propulsion bus shall, at minimum, comprise: battery → main HV fuse → contactor → pre-charge circuit → DC bus → motor controllers → motors, supported by BMS, insulation monitoring, emergency isolation, a DC–DC converter, shore-charging connection, and an auxiliary 12/24 V battery.

9.3. A rooftop solar photovoltaic array(optional) of 3 kWp capacity shall be integrated into the aluminium truss roof deck, to supplement onboard charging and reduce shore-power dependency.

10. Target Operating Performance

Performance is to be optimised for sustained river passenger service under gentle river conditions rather than maximum speed.

Parameter	Specification
Maximum speed	Up to 7 knots
Service/cruising speed	8 – 10 km/h (indicative)
River condition (design basis)	Current ~0.5 m/s
Route performance requirement	Minimum three complete round trips of ~10 km each, at specified passenger load and defined river conditions, with not less than 20% battery reserve on completion

11. Navigation, Safety and Passenger Protection

Safety and navigation equipment shall be treated as integral to the vessel, not as an accessory, and shall include the following, without limitation:

11.1 Navigation

- GPS
- AIS, if mandated or considered appropriate by the certifying authority
- Navigation lights and horn

11.2 Emergency equipment

- Emergency stop and battery isolation switch
- Emergency communication equipment
- First-aid kit and bilge pumps

11.3 Life-saving appliances

- Buoyant apparatus
- Lifebuoys
- Life jackets
- Fire extinguishers, as per applicable inland vessel safety norms

11.4 Battery safety

- Thermal monitoring, protected/segregated battery compartment, HV isolation and BMS protections

12. Indicative Cost

12.1. The design target cost is ~₹2.0 crore per vessel with a ceiling of ₹2.5 crore per vessel. Shipyards are requested to provide their budgetary estimate preferably under following heads; shipyards may indicate their own cost estimate against other heads and are free to add heads as applicable.

Component	Indicative Cost
Hull (Aluminum, Superstructure (FRP), outfitting, painting, interiors & anchor gear	
Propulsion (PMS + Motors + Pods + Controls)	
Battery + BMS + TMS (incl. racks)	
Diesel Generator	
Pumps & piping, valves, fittings	
Electrical panels, items & trays	
Life-saving, fire-fighting, radio & navigation equipment	
Misc items (fenders, vent fans, tyres etc.)	
Design, testing, CFD/model & class charges	
Test & trials	
Yard overheads, misc expenses & contingency	
Transportation & craneage/trucking	
Profit	
Total cost of vessel	

13. Regulatory Compliance and Certification

13.1. The vessel shall be designed, constructed and surveyed in accordance with the Inland Vessels Act, 2021 and the rules made thereunder.

13.2. Stability shall be demonstrated through an inclining experiment and stability booklet prepared in accordance with the applicable Design and Construction Rules, and shall account for the full passenger-load and battery-weight distribution described in this specification.

14. Scope of Supply and Deliverables Expected of the Shipyard

- Detailed design (naval architecture, structural, electrical and stability) based on this specification, for IWAI review and approval prior to construction.
- Construction of the catamaran hull, superstructure and outfitting in aluminium as specified.
- Supply, integration and testing of the propulsion, battery, BMS, charging and solar PV systems as specified (or shipyard-proposed equivalent, with technical justification).
- Installation of navigation, safety and communication equipment as specified.
- River trials and commissioning, including demonstration of the route performance requirement at Section 10.
- Operation and maintenance manuals, as-built drawings, and an initial spares package.
- Warranty and after-sales/maintenance support arrangement, to be specified by the shipyard.

15. Information Sought from Shipyards

Shipyards are requested to respond in writing, addressing each of the following, for evaluation of technical feasibility and indicative pricing:

- Confirmation of technical feasibility of the specification at Sections 4–11, with any recommended modifications and their technical justification.
- Budgetary Estimated (refer to Sec. 12).
- Details of prior experience in construction of aluminium-hulled electric or hybrid passenger vessels (including catamaran hulls), with references and, where available, performance data.
- Proposed propulsion, battery and BMS suppliers/OEMs, with technical datasheets.
- Yard capacity and indicative build schedule (design, construction, trials and delivery) for a single vessel and for a multi-vessel order.
- Any deviations sought from this specification, with reasons and cost/performance implications.

16. Indicative Timeline

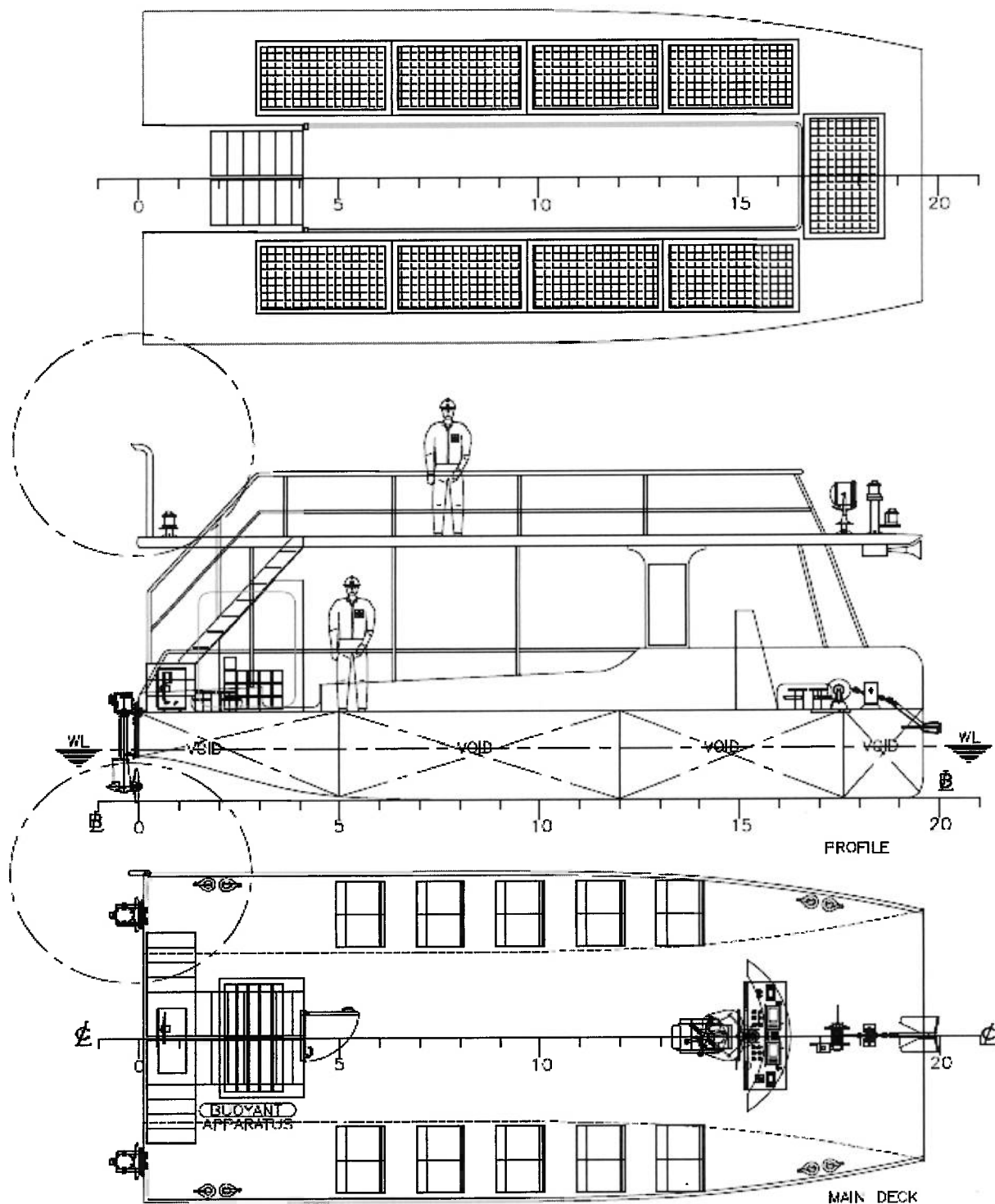
Responses to this document may be submitted electronically to lkrajak@iwai.gov.in and vpandey@iwai.gov.in, on or before **05th October 2026**.

17. Point of Contact

Queries and responses to this document may be addressed to the above address. IWAI reserves the right to invite respondents for further technical discussion.

Annexure-1

20 Pax Fully Electric Catamaran Vessel-General Layout



INDICATIVE IMAGE OF 20 PAX ELECTRIC PASSENGER BOAT

