بسم الله الرحمن الرحيم

Ministry of Finance
Ameenee Magu, Male', Republic of Maldives

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CLARIFICATION 01

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ނަންބަރ No:	**TES/2021/G-013-R01**	
ޕްރޮޖެކްޓް Project:	**Design, Build and Supply of Solar Powered-Battery Operated GRP Made Catamaran Type Passenger Ferry including Support for Operation, Maintenance and Training - Retender**	
ތާރީޚް Issued Date	**13th December 2021**	
ސަފްޙާ ގަނަޑު No. of Pages: -05	ބޮކ.ސ.ބ Boq: -00	ޑްރޮއިންގ Drawings: -00

Please include this clarification when submitting the bid

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- Please find attached, answers to the queries received.

ނަން **Name: Aishath Nadheema**	ސޮއި **Signature:**

MINISTRY OF FINANCE
Male', Republic of Maldives

CLARIFICATION 01

#	Document Name	Document Reference	Query	Response
1			Have you done any studies?	No
2			What is the budget?	Cannot be disclosed
3			How many catamarans are to be build?	One (1)
4			Passengers capacity?	Seating arrangement will be provided for minimum 75 passengers and 3 crew members
5			Speed?	The vessel shall be designed and constructed to operate at a speed of maximum 8 Knots.
6			Range?	Bidder/Firm should optimize the vessel for low propulsive power and it must submit power curve for speed of 5,6,7,8 knots
7			Can a JV be submitted?	If the Supplier is a Joint Venture all of the parties shall be jointly and severally liable to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the Joint Venture.
8		5. Hull outfit and deck equipment 6 Page 6-11 Mast A small mast is to be provided forward on the coach roof for fitting the navigational lights as per statutory requirements.	What is the statutory authority required?	Ministry of Transport and Civil Aviation, Republic of Maldives

9		General Query	Does it require toilets? It doesn't mention on the Specification.	Yes
10		3. Solar PV system & storage -PV Modules Page 6-9 The solar PV modules must conform and be certified according to the latest edition of the following IEC standards: Bidder has to provide valid test certificates for the following o IEC 61215- Part 1 for design qualification and type approval	Is Manufacturer's test certification and IEC Standards acceptable?	The solar PV modules must conform and be certified according to the latest edition of the following IEC standards: Bidder has to provide valid test certificates for the following o IEC 61215- Part 1 for design qualification and type approval o IEC 61730 Part 1 for requirements for construction o IEC 61730 Part 2 for requirements for testing o IEC 61701 for qualifying salt mist corrosion testing
11		1. General Description: Page 6-2 Both propulsion motors and marine grade Lithium-iron phosphate batteries should have type approval from any of the above leading IACS classification societies	Majority of Electric Propulsion motor manufacturer doesn't have type approval certificate issued by class for small to medium range of EP motors. They manufacture the propulsion motors as per IEC Standards which is highly recognized in marine and offshore installations. If required, unit certification can be proposed involving class during manufacturing process based on PDA (product design assessment). Type approval is not required for class approval or review process. Is IEC Standards acceptable?	Both propulsion motors and marine grade Lithium-iron phosphate batteries should have type approval from any of the above leading IACS classification societies. Firms must submit type approval certificate for the Battery and Propulsion motors along with technical bid
12		3. Solar PV system & storage - Battery Bank	Can we propose Li-ion NMC (Nickel Manganese Cobalt) battery banks	Marine grade Lithium–iron phosphate batteries with type approval from any

		Page 6-9 Lithium-iron phosphate type battery bank of minimum capacity 100 kWh (One hundred-kilowatt hour) will be provided as the energy storage option. They will be located in two separate battery compartments, one in each demi- hull. The battery bank in each demi-hull will be connected to its own independent solar charge controller providing redundancy in case of failure of any system. Marine grade Lithium–iron phosphate batteries with type approval from any of the following classification societies IRS/DNV GL/ABS/LR/NK/BV will be provided as the energy storage medium. Batteries will be certified in accordance to IEC standard 62133-2: 2017 and or UL1642.	instead of Liion Phosphate considering duty cycle and faster charging rate?	of the following classification societies IRS/DNV GL/ABS/LR/NK/BV will be provided as the energy storage medium. Batteries will be certified in accordance to IEC standard 62133-2: 2017 and or UL1642
13		3. Solar PV system & storage - Shore Charging System Page 6-10 Battery Management System (BMS) A charger of minimum 20 kW capacity for fast charging at 380-400V with single connector gun of reliable make shall be provided to charge the batteries using three phase AC power from the grid.	We might require to add one diesel generator to charge the Li-ion battery whenever solar power out of range and contingency plan to propel the boat using onboard generator power when boat is in middle of sea and at same time Li-ion batteries are out of order. Since it is sea going vessel, Class may ask functional philosophy which covers this resolution point	To ensure safety and long life of the batteries, a dedicated battery management system will be provided. The system will include cut-offs when the batteries are fully charged and also when the discharge exceeds a specified limit. The BMS will have provisions for PLC (programmable logic controller) based monitoring system for controlling temperature. The BMS will also continuously monitor battery state

				of charge which can be remotely accessed from the wheel house
14		3. Solar PV system & storage - Battery Bank Page 6-9 Lithium-iron phosphate type battery bank of minimum capacity 100 kWh (One hundred-kilowatt hour) will be provided as the energy storage option	The Propulsion power advised and the Battery bank size don't match with the operational requirement, for 25KW x 2 if we consider full power that's 50 KWh which with 100 KWh battery will be less than 2 hours, so to design and size we need the actual vessel operational profile - divided into cast off, maneuvering and berthing and we will also need to have details on the Propeller curve sample attached. the max amount of PV panel area available. the Utilities load etc.	Bidders to provide the following conceptual Design drawings and Documents: 1. General Arrangement 2. Midship section 3. Hydrostatic particulars and cross curves of stability. 4. Preliminary weight & C.G. estimates 5. Preliminary stability calculation 6. Electricity load chart 7. General machinery layout 8. List of main & auxiliary machinery, equipment 9. Any additional drawings required for construction shall also be prepared by the builder and submitted for the approval of the purchaser