

Samudrayaan project trials likely in 2024

3 Persons To Be Sent 6k Metres Deep Into Sea

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Visakhapatnam:The National Institute of Ocean Technology (NIOT) is working on a mission named 'Samudrayaan' to send three people to 6000-metre depth in a vehicle called 'Matsya 6000' for deep sea exploration. The sea trials at 500 metre shallow water depth are likely to be conducted in 2024 before propelling it to 6,000 metres in the subsequent phases.

The indigenous mission will lead India to the elite group of nations as only five countries have so far tasted success with such manned submersible vehicles at such depths. The 'Matsya 6000' will help scientific personnel explore deep ocean mineral resources rich in nickel, manganese, cobalt, and other rare earth elements.

Speaking to TOI, NIOT group head-ocean electronics group Dr Tata Sudhakar, who was in Visakhapatnam to participate in industry innovation meet organised by National Research Development Corporation on Friday, said, "Once a human comes into picture for any operation, safety assumes top priority. As the vehicle has been designed to have an endurance of 12 hours of operational period, factors like oxygen supply and carbon dioxide release, low temperature at deep basins, deep ocean currents, humidity, etc. need to be taken care of. Most importantly, a backup system needs to be in place," said Dr Sudhakar.

Sudhakar added that basic engineering design has been completed for the submersible vehicle. "Life support system was recently tested in



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The Union government launched India's first manned ocean mission named 'Samudrayaan' in 2021

- Samudrayaan is aimed at sending three personnel to **6000-metre** depth in a vehicle called **'Matsya 6000'**
- The vehicle is being designed and developed by NIOT, Chennai
- Design of the vehicle is completed and realization of various components of the vehicle is in progress
- The vehicle will facilitate deep ocean exploration of polymetallic manganese nodules, gas hydrates, hydro-thermal sulphides, and cobalt crusts
- There will be scientific research and technological empowerment
- This mission will also have immediate spin-offs in the form of underwater engineering innovations in asset inspection, tourism, and promotion of ocean literacy

The mission is taken up by the Union ministry of earth sciences

- If this becomes successful, India will join the elite club of nations such as the USA, Russia, Japan, France and China to have such underwater vehicles for carrying out subsea activities

our laboratory tank. The operations of 'Matsya 6000' is likely to be demonstrated at 500-metre depth by this time next year. The mission will be ultimately taken up to 6,000 metre depth in the next phases. As this huge mission has assumed greater national significance, several government agencies and institutions are supporting NIOT in this endeavour.

For instance, the Indian Navy has several deep diving vehicles. We need someone having a submarine experience as a pilot for the mission as we at NIOT are all scientists to travel in the manned vehicle," said Dr Sudhakar.

When asked about the major advantages of the mission, Dr Sudhakar said that it would empower the nation on the research and technology front

besides the direct deep-sea exploration benefits.

According to experts, underwater vehicles are essential for carrying out subsea activities such as high-resolution bathymetry, biodiversity assessment, geo-scientific observation, search activities, salvage operation, and engineering support.

Even though unmanned underwater vehicles have improved manoeuvring and excellent vision systems resembling direct observation, a manned submersible can provide a feel of direct physical presence for researchers and has better intervention capability. With the advancing subsea technologies, the Fendouzhe manned submersible developed by China in 2020 touched about 11,000 metre water depths.