

Hydraulic transport of manganese nodule slurry in vertical pipe lines

Product/Process Profile

In order to transport sea bed minerals (manganese nodules) in vertically upward direction from a sea depth of 6 km in slurry form, the vertical pipe loop test facility has set up for providing basic design parameters. The pipe loop test facility consisting of 75 mm NB and 100 mm NB flexible hose pipes of 20 m high each run by centrifugal pump. One slurry flow meter (magnetic type) and two nos. pressure transducers are mounted on each pipe loop to evaluate the pipe flow characteristics of minerals slurries at different solids concentrations. Based on the experimental data, scale-up design for a depth of 6 km can be determined and provided to National Institute of ocean Technology, Chennai for their implementation for sea bed minerals transportation.

Application Area

- Sea bed minerals (Manganese nodules) transportation

Advantage

- Less energy consuming, high rate of transport and safe technology

Major Raw Materials/Plant Equipments/ Machinery/Gadgets

- Centrifugal pump, Piping & Valves, slurry flow meter, pressure transducers, Data acquisition system

Scale of Development

- Pilot Scale experiments in 75 mm and 100 mm Nominal Bore pipes in a 20m height vertical set up.

Validation Level

- Pilot plant experiments

Commercialization Status

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Techno-economics

- Cost effective method for transportation of minerals from sea bed.

IP Status

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Technology Package

- Engineering drawings, basic design engineering

