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EDITORIAL

Recent Development in Ice Engineering

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ARTICLE INFO

Article history
Received: 8 November 2021
Accepted: 10 November 2021
Published Online: 17 November 2021

Ice Engineering is associated with how to solve challenges from different kinds of ice, such as, sea ice, river ice, lake ice, icing, and snow in cold regions. The aim is to design special structures which could resist structural and global impact from drifting ice and freezing ice.

The foundation of ice engineering is to study ice properties and its action on various structures, icing process within ice mechanics by using theoretical analysis, numerical simulation, model scale tests and field measurements. Ice is a kind of non-uniform material and its properties depends on many factors such as loading rate, temperature, freezing disturbance. The scope of Ice Engineering covers the science and engineering projects in cold regions, especially for offshore oil and gas, Arctic shipping, and offshore renewable energy.

Arctic area is very popular for oil and gas industry. In this area, it accounts 28% of total oil and gas production so far. Moreover, there are 23.9% of world's undiscovered oil and gas resources in the Arctic [1]. There is an increasing interest in oil and gas activities for the petroleum industry in Arctic waters, including a number of locations in Arctic and Subarctic regions where ice loads and ice operations pose major challenges for year around operations [2]. Depending on ice conditions, operation season and location of operation, different types of offshore structures are developed and applied to the oil and gas activities, such as fixed structures, floating platforms and dynamically-positioned vessels.

As for renewable energy, the focus of offshore engineering is changed from fossil fuel exploration and extraction to renewable energy in ice-covered waters. The energy harvesting is mainly from offshore wind and solar in lakes. In winter, icing on wind blades may cause problems to efficiency of electrical production as well as safety and life of wind turbines [3]. The drifting ice may act on marine structures which are used to support solar systems and accumulate around the structures to pile up.

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DOI: https://doi.org/10.30564/hsme.v3i2.4081
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This will endanger overall safety of offshore solar power plant.

A number of scientists and engineers are working at the frontier of Ice Engineering and Hydro Science & Marine Engineering provides an excellent platform for the publication of most updated research outcomes. The Journal focuses on innovative research methods at all stages and is committed to providing theoretical and practical experience for all those who are involved in Ice Engineering.

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