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A Review of Iceberg and Bergy Bit Hydrodynamic Interaction with Offshore Structures

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ABSTRACT

This paper establishes the current state of the art in the subject of iceberg and bergy bit motion during interaction and impact with offshore structures. Our particular interest in the present case is the influence of hydrodynamic interaction on change in velocity as small ice masses approach a larger structure in open water. Iceberg impacts are a design driver for structures located in offshore regions subject to drifting glacial ice. It is found that although many studies note that near-field effects influence the velocity and trajectory of drifting bergs prior to impact, the understanding of near-field hydrodynamic effects such as negative wave drift force, fluid cushioning, shadowing, reduction in impact velocity, and hydrodynamic damping, is incomplete. These effects are more obvious for small ice masses and bergy bits and although they have been identified qualitatively, there is very little quantitative information available. The inability to properly account for these phenomena generally leads to overestimation in impact velocity and consequently input impact energy. Better understanding of hydrodynamic interaction between small icebergs and offshore structures in very close proximity could improve load predictions by improving the estimation of input energy.

KEY WORDS: Iceberg, bergy bit, hydrodynamic interaction, offshore structure, proximity effect, impact load.

INTRODUCTION

Fixed or floating offshore structures in ice prone regions are subject to unique environmental loading by various

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