World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:14, No:08, 2020

Dynamic Behaviors of a Floating Bridge with Mooring Lines under Wind and Wave Excitations

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Abstract : This paper presents global performance and dynamic behaviors of a discrete-pontoon-type floating bridge with mooring lines in time domain under wind and wave excitations. The structure is designed for long-distance and deep-water crossing and consists of the girder, columns, pontoons, and mooring lines. Their functionality and behaviors are investigated by using elastic-floater/mooring fully-coupled dynamic simulation computer program. Dynamic wind, first- and second-order wave forces, and current loads are considered as environmental loads. Girder’s dynamic responses and mooring tensions are analyzed under different analysis methods and environmental conditions. Girder’s lateral responses are highly influenced by the second-order wave and wind loads while the first-order wave load mainly influences its vertical responses.

Keywords : floating bridge, mooring line, pontoon, wave excitation
Conference Title : ICFM 2020 : International Conference on Fluid Mechanics
Conference Location : Vancouver, Canada
Conference Dates : August 06-07, 2020