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Short Communication

Simultaneous Application of Genetic Algorithm and Analytic Hierarchy Process to Generate an Oil Spill Risk Map

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Abstract

Transporting a significant amount of oil and gas from the Persian Gulf has caused damages to marine environment due to oil spills and water pollution. Therefore, it is an important task to model oil spill damages and evaluate risks in order to prevent damages to the ecosystem. By considering the velocity and cleaning capacity of oil cleaning vessels in order to determine the oil slick behaviour, the Genetic Algorithm (GA) was used in several oil spill scenarios to obtain the optimum placement of the vessels. Six major risks of damages were considered for the Persian Gulf and all damages were analysed using Analytic Hierarchy Process (AHP). With simultaneous using of GA and AHP, a quantitative analysis of probabilities of hazards, financial losses and environmental damages was provided. The effects of each major risk based on location, volume of oil spill, weather condition and optimum placement of oil cleaning vessels were determined and overall risks were assessed to develop the risk map of oil spill in the Persian Gulf. As a quantitative evaluation, the critical scenario in the risk map may be a refined oil with a spill size greater than 500 tones with wind speed greater than 14 [m/sec] and happens in spring. Final arrangement for all vessels and an overall risk map is proposed

Biography:

Mohammad Ali Badri has completed his PhD from Isfahan University of Technology (IUT). He has been the director of Hydrodynamics research group at Research Institute for Subsea Science & Technology. He has published more than 50 papers in reputed journals and has been serving as a reviewer of: Journal of petroleum science & engineering, Journal of Energy Efficiency, Journal of Industrial robot and the Open Fuels & Energy Science, Journal Horizon Research Publishing world academic publishing Bentham Science Publishers and His research interests are: Modelling of Environmental Contaminants, Computational Fluid Dynamics (CFD) and Renewable Energies.

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