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| **Title:** | Analyzing the Prospects of Electric Power Generation from Kaplan Turbine Driven Wave Energy Using MATLAB | | |
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| **Abstract:** |  |
| Abstract— Wave energy is sea wave energy, which is harnessed from the ocean or sea waves. This energy is used to generate electrical power, which is very much effective for reducing pollution and the cost of power generation, especially, the cost is much less than any other conventional power generation systems available, for example, diesel, coal, gas, etc. based power plants. Therefore, the main objective of this work is to analyze the prospects of a sea wave energy converter system for Bangladesh, especially in the coastal regions using Kaplan Turbine. Thus, we studied different characteristics of the Kaplan turbine. Then we designed each part of the Kaplan turbine including the speed governor in SolidWorks and assembled them into a complete wave energy converter system. After that, we simulated the designed turbine in MATLAB Simulink to analyze its performances for various systems as well as operational parameters. Finally, we analyzed the cost-effectiveness of such a kind of energy converter that can produce 500 MW of electric power from wave energy in EXCEL. Considering the use of this power plant for a full lifetime of 20 years, it was found that the average cost per kWh of electric energy production is approximately BDTK6.5. In the future, we would like to design control strategies that allow the operation of doubly fed induction generators with the presence of harmonics and unbalanced voltages of the power grid. We would also like to design the energy storage system since there is no scope for the use of electricity all the time when wave energy is available. | |