

## Maximization of Conversion Efficiency of Attenuator type Wave Energy Converters by Nature Based Optimization Techniques

Conversion efficiency of Wave Energy Converter depends on the efficacy of the power takeoff unit, prime mover, hydraulic circuit and stability of mooring structure.

However due to the complexity and non-linearities that exist in the interaction between the elements complete transformation of wave energy into electrical energy is not possible.

Again the cost for conversion of energy from ocean waves into electrical energy and its supply to grid for distribution is a matter of concern which prevent wide scale implementation of wave energy converters for supplying to the demand for electricity.

Cost of materials and the low efficiency of the elements which are generally employed for production of electrical energy also raise the total cost of installation, operation and maintenance,

Expected Outcome :

Optimal value for the following parameters :

- 1) Shape and Size of the container
- 2) Efficiency of Prime Mover and Rotary Equipment
- 3) Material, Shape and Size of Mooring Structure
- 4) Selected hydraulic fluid

which ensure maximum efficiency against minimum cost possible within the applied constraints.

As per the configuration identified in the optimization phase a prototype may be prepared and tested in laboratory and real life environment for reliability and if satisfied, commercial models may be produced.

In the present study, an approach was attempted to maximize the conversion efficiency of Attenuator type wave energy converters and minimization of cost for installation and operation with the help of nature based optimization techniques.

Here, the shape and size of the container, efficiency of prime mover and rotary element along with the stability of the mooring structure and fluid type was varied in such a manner that it increase the efficacy of the conversion process.