

# Design and Development of Ocean Wave Energy Power Generation System

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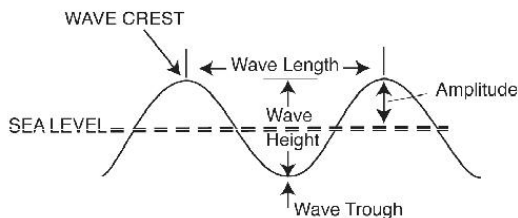
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**Abstract:-** Ocean waves are a huge, largely untapped energy resource, and the potential for extracting energy from waves is considerable. Research in this area is driven by the need to meet renewable energy targets, but is relatively immature compared to other renewable energy technologies. This review introduces the general status of wave energy and evaluates the device type that represents current wave energy converter (WEC) technologies. Here, our research paper focusing to eliminate the existing limitations of wave energy converter methods, and also helps the potential of this method for generating electricity and this could be common way to producing electricity in future.

**Keywords-** Ocean power generation, wave energy, power generation, wave energy conversion system

## I. INTRODUCTION

Wave energy is as source of power that comes from the endless march of the waves as they roll into the shore then back out again. Humans harness this power along the coastal regions of the India, United States, Canada, Scotland, and Australia. Energy that comes from the waves in



[Fig: Ocean Wave nomenclature]

the ocean sounds like a boundless, harmless supply.

Ocean Wave Energy also known as Wave Energy, is another type of ocean based renewable energy source that uses the power of the waves to generate electricity. Unlike tidal energy which uses the ebb and flow of the tides, wave energy uses the vertical movement of the surface water that produce tidal waves. Wave power converts the periodic up-and down movement of the oceans waves into electricity by placing equipment on the surface of the oceans that captures the energy produced by the wave movement and converts this mechanical energy into electrical power.

The point absorbers method, oscillating water column, wave overtopping reservoir, Tidal lagoon power, Ebb & Flood generation and many other method are established but they have limited working features.

Waves transport energy from where they were created by storms far out in the ocean to a shoreline. But a typical ocean wave does not resemble a perfect sinusoid, they are more

irregular and complex than a simple sinusoidal wave. Only the steady up-and-down movement of a heavy swell resembles a sinusoidal wave much more than the chaotic nature of locally generated wind waves.

The method extend perpendicular to the direction of the wave and capture or reflect the power of the wave. These devices are typically onshore or nearshore; however, floating versions have been designed for offshore applications. The method have potential to produce power 500kw to 2mw, according to systems size and using in series or parallel system.

## II. PROBLEM STATEMENT

- Mostly the current technology are consist submerged or floating type structures. So they affected to limitations (like corrosion, fouling) hence the special type of material required, Also design, operation quite complex; so they're not economic feasible.
- Affecting the marine ecosystems.
- Generally located to deep sea, so the power distribution not reliable. In some of the cases chances of international conflict.
- The limitations of working principle, the continuous power output not achieve. (Depending on Flood tide and ebb tide, Air pressure difference.)

## III. OBJECTIVE

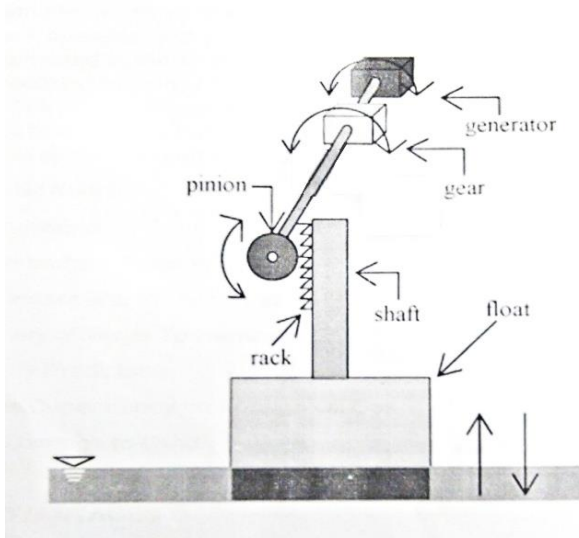
- To achieve continuous electricity power output.
- For desalination of water, also to operate machine tools etc.
- Use for remote area's where transmission and distribution not feasible (like islands).
- The system located above sea level (also at territorial to contiguous range) so, the problems discuss above will be eliminated.

## IV. LITERATURE REVIEW

- Tidal power: An effective method of generating power
- Ocean energy: The future of renewable energy
- Current trend and prospect of tidal energy technology
- Wave energy conversion device
- Wave energy for desalination plant
- Design & fabrication of power generation by combined wind & tidal turbine.

## V. WORKING PRINCIPLE

The system consists mechanical arrangements by which continues wave energy would be captured and this captured energy further transmitted and converted into mechanical energy. So Here the float has direct contact to ocean wave as the wave passed through system the float will captures energy and simultaneously the gear are in action and start rotation according to intensity of wave. Thus the connected gear transmitted energy to generator ,and generator produces electricity which is stored or directly use; And the system is continuous work in same cycles.



[Fig: Working principle of ocean wave energy converter]

## VI. CONCLUSION

As increasing demand of energy, the alternative way can be useful in future. With design at large scale to fulfil the power demand of domestic as well commercial. The dependency on Non renewable resources will be overcomes and reducing emissions of green house gases.

In future, this method can be developed more and area of establishment are using it in series of system. As per our design we observed from prototype the power generate only in upward motion of float while the downward motion can not be utilised, so to utilise both motion of float we can solve this problem by designing the gearbox to produce continuous power with single generator. Also by placing two generator one can produce in upward motion & other one will produce energy in downward motion. This can be alternative way to fulfil the energy demand and prevention again energy crisis.

## VII. PROTOTYPE



## VIII. ACKNOWLEDGEMENT

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