ISSN : 2348 - 9065 (Online)
ISSN : 2349 - 3143 (Print)

Can Direct Business Operations of Large Self-propelled Sea Wave Power Device

Shoucai Pan

Abstract

It is estimated that the world can to be development and utilization of wave energy up to 2.5 TW. This suggests that sea waves energy is huge. But so far, In the world is not can be directly commercialization of wave power device, decent power systems. This article not only theoretical breakthrough and technological breakthrough, can achieve commercialization of large sea wave power directly, very decent power generation. Economic and social benefits are high, Welcome cooperation development.

Keywords

Principle of wave work-energy, Self-propelled, Size match, Weight matching, theoretical breakthrough

I. Introduction

First, wave energy is huge, it has been recognized. The second, but is not sent out decent electricity, it's the truth. Third, especially since the world has no commercial operation of large sea wave power device, and true. Fourth, this article has to publish online exclusive technology [2] scheme of ten years ago: commercial operation can be directly self-propelled large sea wave power device, as follows. Fifth, studies show that huge wave energy could not make electricity, mainly because of theory bottlenecks and technical bottlenecks. This article opens two bottlenecks of know-how, In order to find the corresponding international power enterprise, cooperative development wave power of new and high technology. Create economic benefits and social benefits.

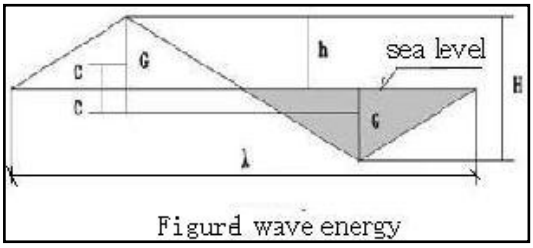
II. Theory and Theory breakthroughs

1. Wave power theory bottleneck

Theory of bottleneck is, wave energy has more perfect theoretical calculation: 'the time domain mode[1] and 'frequency domain model'[1], but superficially clever, cannot calculate average 2 or 3 meters high waves' energy exactly how many.

Therefore, this article had to give 2 or 3 meters high waves energy be calculated not only simple and practical and conservative and reliable.

Common wave waveform is close to sine curve, for simple do triangle theory calculation as shown in figure 1:



Figurd wave energy

In figure 1 white triangle on behalf of the wave crest, black triangles represent wave troughs. Density of sea water as ρ = 1000 kg / m3, the wave height H as 3 meters, wave wavelength λ= 80 meters, the wave period T off for 10 seconds. G is the center of gravity of the triangle.

So, a linear meter of waves, within a period T, the change of potential energy, equivalent to the location of the black triangle to white triangle. The potential energy changes in W_1, then:

W_1 =120000 Kg - m

So, expressed in N_1 wave power per meter length:

N_1 = 12000 Kg / s = 160 horsepower = 117 KW

This is obviously the most conservative calculations; that is to say, 3 meters high waves of each factor, there are at least 117 kilowatts of energy. If use sine curve calculation, power can significantly increase.

This calculation results have shown that wave energy is huge. But Chinese scholars, some say, 2-3 meters high waves energy, each factor that power is only 3 to 7 KW, this data clearly inappropriate.

In addition, the waves and also the corresponding kinetic energy, for kinetic energy, not only hard to calculate, to extract more difficult, so ignore it.

2. Wave power technology bottleneck

There are three wave power technology bottlenecks:

The first point: wave power device overall size must match the wave wavelength λ. Size does not match cannot effectively to generate electricity. Size does not match: this is the common fault of the all power devices. This is the key factors influencing the generation capacity.

The second point: the total weight of wave power devices need to match the wave height. This is wave power device another key factor.

The third point: wave power need to conform to the wave work-energy principle.

Sadly, this principle, the world is no one understands. This principle shows that a wave come over, use the float, a float maximum extraction is 0.75 wave energy.

III. The power generation device design

Then, can be direct commercial operation, self-propelled large sea wave power device design scheme for the following figure 2:

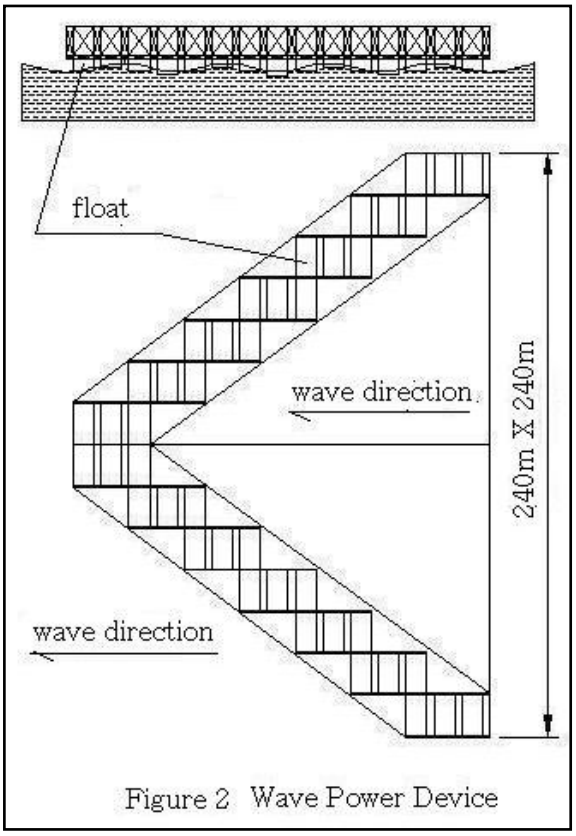


Figure 2 Wave Power Device

The first, the device was able to walk by oneself, at three point in the reserve sea surface of the anchor to generate electricity.
The second, the device on the above of the sea surface, is a triangle steel truss structure, out of the sea water corrosion. When the wave power, steel truss structure is stability unassailable, as motionless as a statue.
Third, floater is glass fiber reinforced plastic products, be able to bear or endure seawater corrosion, as the waves up and down movement within the truss, can pick up the waves energy. According to the functional principle of wave energy efficiency on pick up is 0.75. Adopts hydraulic drive, the efficiency is 0.8. The overall plant efficiency is 0.6.
The fourth, this device size match the wave wavelength λ completely, can be the most effective power.
Fifth, the total weight of this device, matching with the wave height can also be the most efficient generation of electricity.
The sixth the number of float design conforms to the wave "principle of function" and therefore can effectively to generate electricity.
The seventh, the device shape size is 240 m X 240m. can resist 12 the typhoon. Design life of 10 years.

IV. Economic benefit analysis

This device is the total weight of 5300 tons. Total cost is 58 million yuan RMB, cost performance is 3440 yuan RMB per KW, Is far less than the ground thermal power. In the 3 m waves of work area, power generation total efficiency of 0.6, the output power for 16848 KW.
Work 20 hours a day, throughout the year work 200 days, total generating capacity 67392000 degrees. According to 0.8 yuan per kilowatt-hour parallel in, Annual income is 53.91 million yuan RMB. So, 13 months can recycle early all one-time investment. Economic benefit is very considerable.

V. Conclusions

The first, wave energy is huge. Second, this device theory and technology of a major breakthrough, effectively solves the bottleneck problem of wave power, effective power. Third, the huge economic benefits and social benefits, is worth energetically promoting. Fourth, welcome to conditional enterprise cooperation development. 2016-06-10

References

[1] *http://www.doc88.com/p-2009597463828.html Based on the time domain model of a new wave energy calculation method*
[2] *http://blog.sina.com.cn/s/blog_624e65b40101krlj.html Can be directly commercialization of sea wave power device*