

Surge wave Desalination Equipment



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Basis for large-scale utilization of ocean energy by human beings

The basis for large-scale utilization of ocean energy by human beings is the invention of the machine with commercial profit; otherwise, it will not attract the interest of commercial capital, and the efforts of human beings can only stay in the experimental stage.

Ocean energy equipment must comply with the following conditions simultaneously before it can have the commercial value,

- 一、 Safety

- 1、 It is safe and capable of power generation in case of typhoon at Scale 12
- Capable of resisting: the jacking force from down to up, and hitting force, bending force and twist torsion from up to down
- 2、 Capable of being adapted to the tidal range
- 3、 Strong capacity against corrosion
- 4、 Strong capacity against adhering

- 二、 Low cost

- 1、 Low manufacturing cost; 2、 Low transportation cost
- 3、 Low installation cost ; 4、 Low fixed cost
- 5、 Low maintenance cost ; 6、 Low operation cost
- 7、 Low grid-connecting cost ; 8、 Low environmental protection expenses
- —— With the unit: kw, the above total cost is slightly higher than that of the offshore wind power, and is no more than 50%.

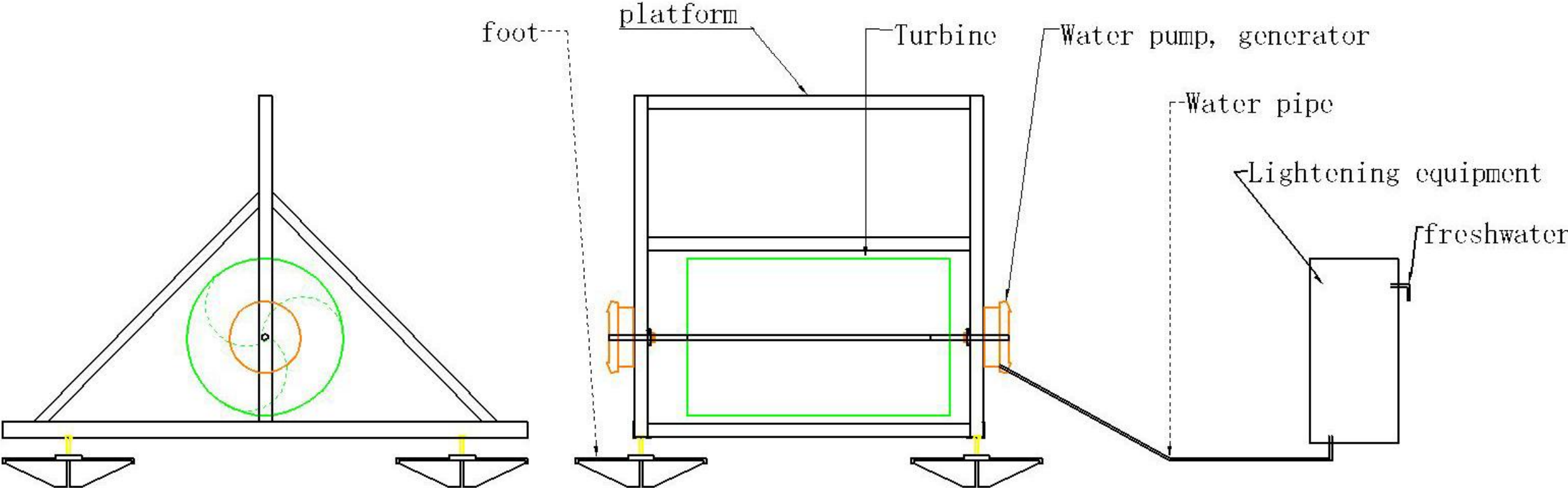
—、 The travel of the surge is n times of the travel of corrugated wave

- Wave mainly exists in two forms, :
- 1、 Ripple form, where the wave moves in the up-down direction, and mainly exists in the deep-water zone.
- 2、 Surge form, where the wave moves back and forth in horizontal direction, and exists on the shoreside.
- Travel of the ripple wave= peak- valley, that is, the height of the wave determines the travel of wave;
- Travel of the surge = wave length, that is, the travel of horizontal surge reaches one wavelength theoretically. 。
- Wavelength is much bigger than wave height: according to the observation, the general wavelength/wave height $\approx 25\text{m}/1\text{m}$. It may be seen that in the same cycle, the distance moving with the wavelength is many times bigger than the distance moving with the wave height. 。
- For the devices in the same scale, if the surge can be used, the efficiency will be higher by many times. Supposing wavelength/wave height $\approx 25\text{m}/1\text{m}$, then the efficiency for the utilization of surge is up to 25 times theoretically.
- Horizontal water turbine cannot only make use of the up-down energy of ripple wave, but also make use of horizontal energy from surge; when it is placed on the seashore to make use of the surge, the efficiency will be higher by many times.

二、 Working principle of this invention

- Water turbine turns the surge into the torque of the shaft, the shaft of water turbine transmits the torque by the gear to the high-pressure pump, which transports the sea water through the pipe to the desalination equipment on the shore. After the filter membrane, it will produce the drinkable freshwater. The high-pressure pump can be replaced by the power generator, the power from the power generator drives the desalination motor to produce freshwater.
- Water turbine is installed on a support platform, for which the specially made “foot” can resist the transportation of the drift sand, thus guaranteeing the stableness of the platform on the sand bed, and resisting the attack of typhoon.
- The filtered substances, such as salt, can be piled together for use by the chemical enterprises; or can be brought back into the sea.

Schematic:



experiment:



Use the wave up and down to do work



Doing work with swelling lateral travel

Transportation, installation :

It can be transported in containers and, once installed at the destination, can be manually lifted into the seabed or lifted to the seabed by barges. The picture on the right shows the forklift lift.



三、team



Chen Wenbin

engaging in the research on the utilization of ocean energy for more than ten years, with multiple invention patents. Main inventor of this competition scheme; team leader.



Dr. and Professor Pan Jianfei has multiple patents on the utilization of ocean energy; serves as the expert on control of electric appliance and energy storage.



Li Zhimao is the desalination equipment manufacturer, and serves as the main inventor of 7 desalination technology patents



Xiao Peng, graduate student in control engineering, studies wave energy conversion efficiency.

三、team



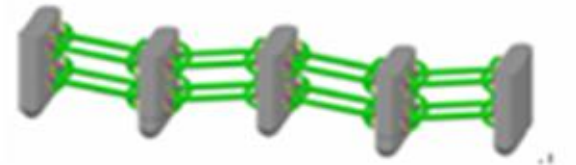
Huang Ren, graduate student in control engineering, studies wave energy generation.



The team has a plan :

Patented equipment

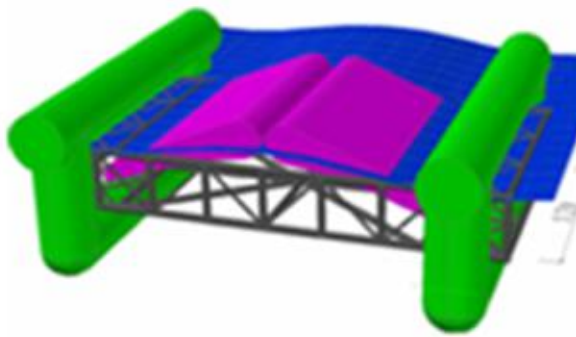
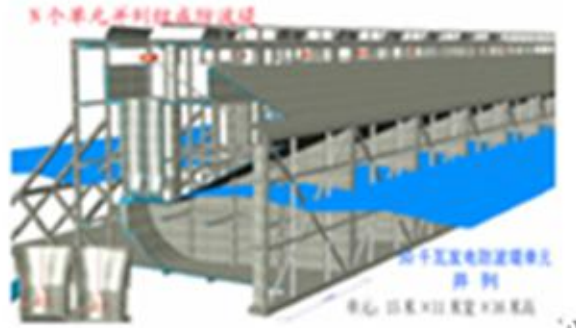
Turbine type wave power generation equipment., Multi-floating link power generation equipment.,



Inspired by the sea snake



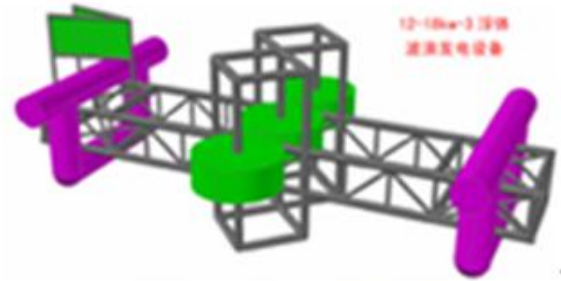
Double contraction channel power generation breakwater., Wave amplification power generation ship (double duck type).,



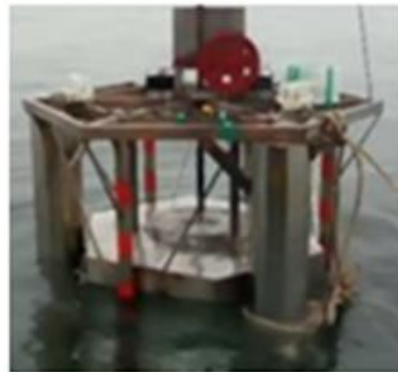
Wave-amplified power generation ship (turbine type).,



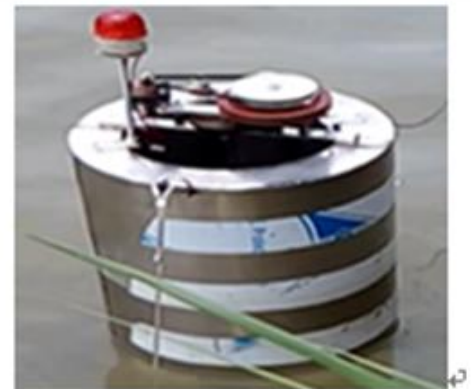
Wave-amplifying power generation ship (multi-floating type).,



Wave power generation device with automatic anchor chain adjustment device.,



Turbine buoy.,



Conclusion

- This team has quite strong backup research and development capacity, and has multiple patent schemes. Based on the design scheme in the Chinese sea area with average wave height of 1m, the equipment is used in the wave zone with average wave height of more than 2m in the west and east coasts of USA, and the designed scheme has the conversion efficiency higher by multiple times.
- Once the fund is sufficient, the production can be organized immediately, so as to make full use of rich wave energy in the west and east coasts of USA.

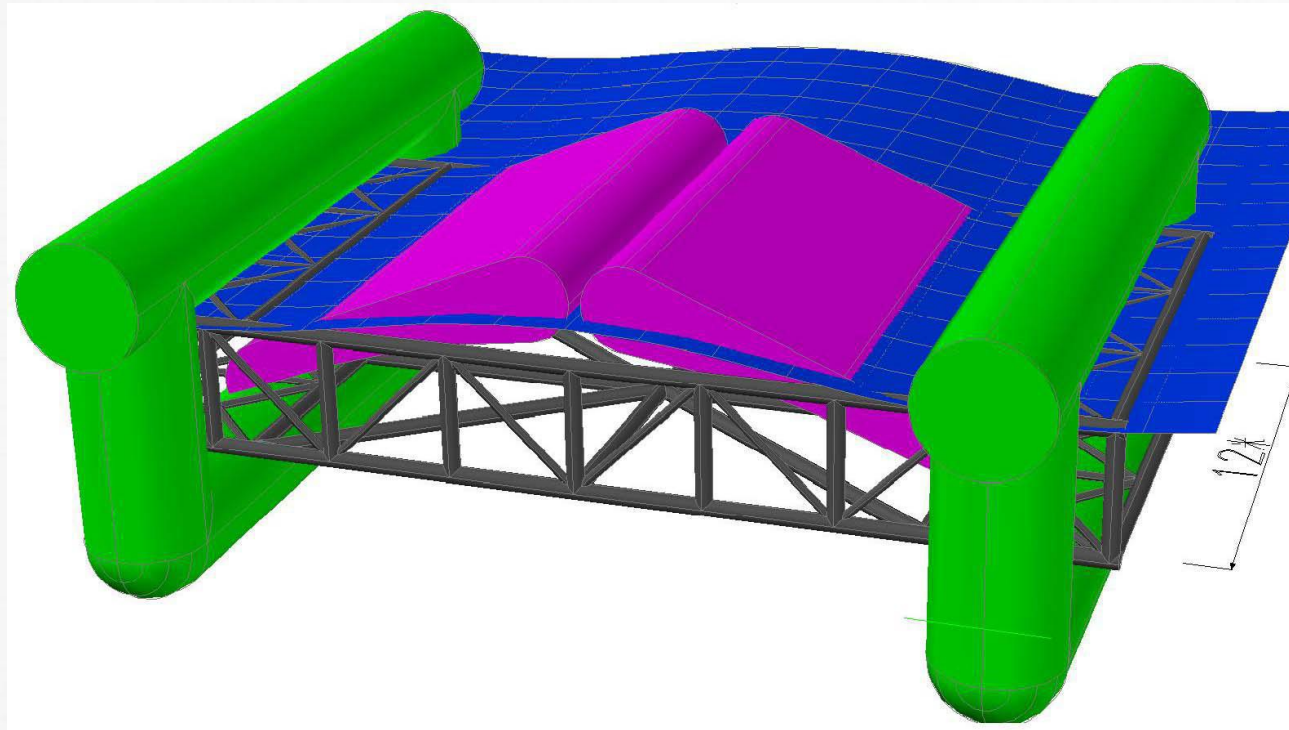
五、 other products - oscillating water column



- **Single floating body wave power generation equipment 0.1-4kw**



Double duck type 50kw wave power generation equipment



blueprint



Pearl River
Experiment

Thanks

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