DESIGN PARAMETERS OF FLOATING SOLAR POWER PLANT

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Abstract

The main problem with solar energy is the need for soil that is barely accessible in the globe and even expensive to obtain. But floating solar plants can be built in any water bodies that will not only decrease the price of the property, but with the cooling impact of water will increase the quantity of electricity. This article focuses on the floating platform's design parameters but will also concentrate on the ecosystem's impact of panel shade.

Key words: solar, floating solar plants, ecosystem.

Introduction

Solar energy is sun-generated energy derived through a thermonuclear system and this method causes heat and electromagnetic radiation to fade. These electromagnetic radiations[1] contain the power that reaches the earth. Now we are enchanting the availability of water bodies in distinct areas with the idea of floating solar. Since we don't have to use a big region with this concept, it's easy to solve the land issue for the solar plant. Also, bearing in mind that the acquisition of property in India is not a simple task, this kind of concept is not disputed. If tiny PV Station panels can be created, requiring a tiny water depth for floatation, they can be placed in ponds wherever necessary. The cumulative[2] ability to generate could be significant.

Methodology

The constructional details of different parts are as given below:

1. Solar PV module

   Solar cells are a solar panel's construction blocks. Solar cells are combined to create one solar panel at maximum energy output.
2. String Inverter[3]

   This AC power is used by the inverter for loading. The location of the inverter is regarded above the floating platform. The inverters (phase 3) will be intended new technology.

3. Module mounting structure

   The mounting system of the module is intended to hold the appropriate number of modules over the rooftop in sequence.

4. Cable and connectors

   Cables will be highly robust, with a strong mechanical load and abrasion resistance[4]. The wires used provide lengthy service life with high temperature resistance and outstanding weatherproofing features.

5. FRP floating platform[5]

   Characteristically, a floating platform would consist of hollow parts for efficient self-weight ratio and is made of low-density material.

6. Mooring[6], [7] arrangement

   The platform must be kept in a place that allows slight motion which is performed readily with bound nylon ropes at each corner and attached to the bank's bollards.

7. Access gangway from the bank

   For cost savings, a continuous approach gangway from the bank may be dispensed with and a tiny ship may be used for occasional panel cleaning and maintenance purposes.

8. Electrical installations on the bank

   Thus, a finished module will be introduced and other modules will follow. To form the total configuration, the floating modules will be connected to each other.

Conclusion

Solar panels are naturally cooled down and it solves the overheating issue. The evaporation is reduced by 70%. The plant constructed is comparatively more eco friendly than other thermal power plants. The plant also improves the eater quality due to the exposure of the sun.

References

[1] S. Geetha, K. K. S. Kumar, C. R. K. Rao, M. Vijayan, and D. C. Trivedi, “EMI shielding: Methods and materials - A review,” *J. Appl. Polym. Sci.*, 2009.

[2] W. Javed, B. Guo, and B. Figgis, “Modeling of photovoltaic soiling loss as a function of environmental variables,” *Sol. Energy*, 2017.

[3] S. Harb, M. Kedia, H. Zhang, and R. S. Balog, “Microinverter and string inverter grid-

connected photovoltaic system - A comprehensive study," in *Conference Record of the IEEE Photovoltaic Specialists Conference*, 2013.

[4] H. Li, M. hua Zhang, and J. ping Ou, "Abrasion resistance of concrete containing nano-particles for pavement," *Wear*, 2006.

[5] A. C. Young, H. J. Dagher, S. Hettick, A. J. Goupee, and A. M. Viselli, "VolturnUS 1:8-scale FRP floating wind turbine tower: Analysis, design, testing and performance," in *Proceedings of the International Conference on Offshore Mechanics and Arctic Engineering - OMAE*, 2014.

[6] N. Y. Sergiienko, B. S. Cazzolato, B. Ding, and M. Arjomandi, "An optimal arrangement of mooring lines for the three-tether submerged point-absorbing wave energy converter," *Renew. Energy*, 2016.

[7] M. Goldschmidt and M. Muskulus, "Coupled mooring systems for floating wind farms," in *Energy Procedia*, 2015.