

Application Case and Result Consideration About Basic and Working Design of Floating PV Generation System Installed in the Upstream of Dam

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Abstract : K-water (Korea Water Resources Corporation) conducted basic and working design about floating PV generation system installed above water in the upstream of dam to develop clean energy using water with importance of green growth is magnified ecumenically. PV Generation System on the ground applied considerably until now raise environmental damage by using farmland and forest land, PV generation system on the building roof is already installed at almost the whole place of business and additional installation is almost impossible. Installation space of PV generation system is infinite and efficient national land use is possible because it is installed above water. Also, PV module's efficiency increase by natural water cooling method and no shade. So it is identified that annual power generation is more than PV generation system on the ground by operating performance data. Although it is difficult to design and construct by high cost, little application case, difficult installation of floater, mooring device, underwater cable, etc. However, it has been examined cost reduction plan such as structure weight lightening, floater optimal design, etc. This thesis described basic and working design result systematically about K-water's floating PV generation system development and suggested optimal design method of floating PV generation system. Main contents are photovoltaic array location select, substation location select related underwater cable, PV module and inverter design, transmission and substation equipment design, floater design related structure weight lightening, mooring system design related water level fluctuation, grid connecting technical review, remote control and monitor equipment design, etc. This thesis will contribute to optimal design and business extension of floating PV generation system, and it will be opportunity revitalize clean energy development using water.

Keywords : PV generation system, clean energy, green growth, solar energy

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