

Standardization of Solar Water Pumping System for Remote Areas in Indonesia

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Abstract : The availability of spring water to meet people demand is often a problem, especially in tropical areas with very limited surface water sources, or very deep underground water. Although the technology and equipment of pumping system are available and easy to obtain, but in remote areas, the availability of pumping system is difficult, due to the unavailability of fuel or the lack of electricity. Solar Water Pumping System (SWPS) became one of the alternatives that can overcome these obstacles. In the tropical country, sunlight can be obtained throughout the year, even in remote areas. SWPS were already widely built in Indonesia, but many encounter problems during operations, such as decreased of efficiency; pump damaged, damaged of controllers or inverters, and inappropriate photovoltaic performance. In 2011, International Electrotechnical Commission (IEC) issued the IEC standard 62253:2011 titled Photovoltaic pumping systems - Design qualification and performance measurements. This standard establishes design qualifications and performance measurements related to the product of a solar water pumping system. National Standardization Agency of Indonesia (BSN) as the national standardization body in Indonesia, has not set the standard related to solar water pumping system. This research to study operational procedures of SWPS by adopting of IEC Standard 62253:2011 to be Indonesia Standard (SNI). This research used literature study and field observation for installed SWPS in Indonesia. Based on the results of research on SWPS already installed in Indonesia, IEC 62253: 2011 standard can improve efficiency and reduce operational failure of SWPS. SWPS installed in Indonesia still has GAP of 51% against parameters in IEC standard 62253: 2011. The biggest factor not being met is related to operating and maintenance handbooks for personnel that included operation and repair procedures. This may result in operator ignorance in installing, operating and maintaining the system. The Photovoltaic (PV) was also the most non-compliance factor of 71%, although there are 22 Indonesia Standard (SNI) for PV (modules, installation, testing, and construction). These research samples (installers, manufacturers/distributors, and experts) agreed on the parameter in the IEC standard 62253: 2011 able to improve the quality of SWPS in Indonesia. Recommendations of this study, that is required the adoption of IEC standard 62253:2011 into SNI to support the development of SWPS for remote areas in Indonesia.

Keywords : efficiency, inappropriate installation, remote areas, solar water pumping system, standard

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