



FAULT IDENTIFICATION IN MICRO-HYDRO POWER GENERATOR BASED ON THE SHORT-TIME FOURIER TRANSFORM

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ABSTRACT

A condition monitoring system of vertical axis turbine micro-hydro power generation system is proposed in this study and the short-time Fourier transform is applied in identifying the fault. There are many low-head (small drop) waterway, usually only used for irrigation or transportation but not power generation in the world. This study intends to use a vertical turbine generator in the existing canal or irrigation channels to research micro-hydroelectric power including system design, generating power estimation, lightweight blade design, turbine efficiency assessment, and condition monitoring system. The high flux permanent magnet synchronous generator inside the unit is gearless drive system has benefits of small size, light weight and flexible structure design. There are many mechanic components in micro-hydro turbine generator. Not only the fault caused by electric, the damage of mechanical but also affects the generated electrical power, therefore, the condition monitoring system of vertical axis micro-hydro turbine system necessary. The study uses the short-time Fourier transform method to identify the fault of micro-hydro generator. The method reduces the cost and has abilities of detecting electric and mechanic faults.

Keywords: Vertical Axis Turbine Micro-hydro Generator, Condition Monitoring System (CMS), Short-Time Fourier Transform (STFT)