

소수력 성능향상 사례연구

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An Application Case Study of Improving Performance of Small Hydro-power

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In this paper, it is intended to study about deferences of design and operation properties between large and small hydro-power house's turbine which type is reaction. In generally, turbine of large hydro-power has a more safe and effective energy output mechanisms than small hydro-power's because the turbine of small hydro-power is more sensitive to hydraulic losses. But, it is more effective for the all energy market to improve the capability and efficiency of small hydro-power in the present status of increasing construction of small hydro-power than large hydro-power. Therefore, we intend to investigate and introduce the way to enhance the efficiencies of reaction turbine adopted to small hydro-power.

Key words : Small Hydro-power(소수력), Hydraulic Efficiency(수력효율), Reaction(반동), Draft Tube(흡출관)

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표층수의 월류를 통한 소수력발전소 수차터빈측의 유동안정화 연구

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Studies on the flow stabilization around the turbine suction with utilizing the surface water overflow at small-hydraulic power plant

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Flow with suction to water turbine must be in stable state at small hydraulic power plant. But because of water level fluctuation and water gate effect according to irregular supply of cooling water, it would happen to produce bubble and vortex and finally lead to problems in power-plant system. With utilizing the concept design of double size gate, surface water overflowed the overhead of gate for stable flow at suction. We developed the overflow condition and analyzed the design factor with existed one such as water level(overflow amount) and overhead of water gate(overflow figure). Flow test and CFD simulation say that flow have stable state around suction and 20% of wave reduction effect at surface layer after surface water overflow.

Key words : Surface water over-flow(표층수 월류), Small hydraulic power plant(소수력발전소), Double side water-gate(2단식 수문)

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