

Dynamic Modelling and Simulation of Kurichhu Hydropower Plant

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Abstract— This paper presents a part of the ongoing research project entitled ‘University-Business partnership Project Modelling and Analysis of Bhutan’s Hydropower Plants’. A realistic Simulink model resembling the actual system is necessary to study its control mechanism, monitoring and the operation of the power plant. The modelling and simulation of Kurichhu Hydropower Plant (KHP) is the third phase of the above research activity. In this paper the mathematical model of the hydraulic system of KHP i.e. Water Hydraulics, Turbine and Turbine Regulator are developed in MATLAB Simulink and the Voltage Controller and the Generator models are adapted from DIgSILENT PowerFactory. The complete Simulink model is then simulated using the real-time measured data and the results are being compared with the actual system responses. The degree of closeness of simulation with the actual responses validate the Simulink Model.

Keywords—Hydropower Plant, Water Hydraulics, Turbine Regulator, Voltage Regulator, Generator, DIgSILENT PowerFactory, MATLAB Simulink

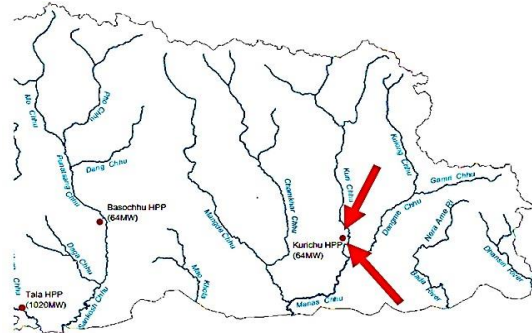


Figure 1: Location of Kurichhu hydro power plant in the map of Bhutan