

Maximum Frequency Deviation Calculation in Small Isolated Power Systems

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Abstract— Large frequency deviations due to a number of disturbances are frequent in small isolated power systems. The maximum frequency deviation in the system is limited to prevent other generator tripping. It is important to have an accurate model to calculate it, both for system planning and operation. A new simplified model to calculate the maximum frequency deviation when either a generator or load-related disturbance occurs in these systems is presented. This model takes into account the response of governor- prime mover even when different technologies are present in the power system. Model parameters can be easily obtained from either more complex models or from test records. Simulation results for an actual power system aimed at checking the model accuracy are presented. High accuracy is obtained while computation time is reduced due to the simplicity of the model.

Index Terms— Frequency deviation, isolated power systems, load shedding, minimum frequency, spinning reserve

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