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## Study on Frequency Fluctuations in Power System with a Large Penetration of Wind Power Generation

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### Abstract

*As wind turbine output is proportional to the cube of wind speed, the wind turbine generator output fluctuates due to wind speed variations. Hence, if the power capacity of wind power generators becomes large, wind power generator output can have an influence on the power system frequency. Therefore, this study investigates the influence of the ratio of the wind generator capacity to the power system capacity, on the power system frequency. Thus, the impacts of different governor control system models are investigated with different operating modes of synchronous generators (SGs), when a total capacity of SGs are considered as 100 MVA. It is seen that though thermal governor control system perform better frequency control, but it cannot be maintained to the acceptable level when wind power capacity become 10% of total capacity. Finally, it is seen that when several interconnected SGs are operated with different control modes, system frequency become more severe for 10% capacity of wind power.*

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