The Impact of Renewable Energy Integration on Stability of the Jordanian National Grid

Abstract

The electrical power demand is increasing due to the high population growth rate, industrial investments expansion, and modern lifestyle requirements. Renewable Energy Sources (RES) have been taken into account to cover the highly increase in power demand. In this thesis, the impact of the integration of the RES on the electrical power system stability in Jordan has been studied. Load flow analysis, including voltage and electrical power losses, has been measured for minimum and maximum loading of the system. The dynamic behavior of the electric power system with and without RES for minimum and maximum loading has been proposed. The dynamic behavior of rotor angle, frequency and voltage stability has been studied. The simulated response curves have been presented for several cases. The results show that adding RES to the conventional power system affects the frequency stability in the case of minimum loading. Rotor angle stability curves show a good response with RES. The voltage profile of the integrated electrical power system has been improved as the penetration of RES increased. The case studies have been simulated using DlgSILENT Power Factory simulation software. The components and parameters used in DlgSILENT software are the same as the
actual system under different operating conditions.

References

4. ‘Ministry of Energy and Mineral Resources (MEMR) of Jordan’.
5. ‘The Royal Scientific Society (RSS)’.

Index Terms
Keywords