

This thesis concerns with a study on the impacts of induction generator hydroelectric power plant on distribution system. The thesis focuses mainly on the impacts of induction generator on voltage profile and line losses. Effects of generation capacity, induction generator location, induction generator size, load and shunt capacitor to be installed on induction generator bus bar are investigated. A case study is carried out on a small-scale hydroelectric power plant at Mae Ya that owned by Provincial Electricity Authority (PEA). In this thesis, a power flow program is developed and can be used as a tool to analyze the impact of induction generator on distribution system. The power flow analysis computed by this program is robust and provides high accurate result.

It is found that voltage level in distribution system drops significantly when induction generator becomes online. However, line losses in distribution system depend on several factors such as generation capacity, load and induction generator location. Finally, voltage regulation and line losses in distribution system are greatly improved when shunt capacitors are taken into account.