Abstract

Voltage stability is a major concern while designing a foolproof power network. In recent years deregulated environment put an additional pressure on transmission and distribution utilities. With this fact assessment of voltage stability along with the preventive control actions are major area of research. With this motivation, this paper presents assessment of voltage stability through Global Voltage Stability Margin (GVSM). GVSM is an indicator of the system’s health from a voltage stability perspective. Three standard IEEE bus systems are simulated with different loading scenarios. Static Var Compensator (SVC) has employed for preventive control in collapse condition. The location of SVC is finalised through weak bus identification methods. Voltage stability indices namely Fast Voltage Stability Indice (FVSI) and Lmn are utilized to identify weak buses in the systems. For calculation of the Size of SVC, an optimization routine is established. This routine has an aim to maximize the GVSM. Gravitational Search Algorithm (GSA) is used for the optimization. The results obtained from proposed method are promising.
Voltage Stability Assessment using GVSM and Preventive Control using SVC


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Index Terms

Computer Science

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Keywords

Global Voltage Stability Margin (GVSM), Fast Voltage Stability Index (FVSI), Gravitational Search Algorithm (GSA) and IEEE test bus systems