Abstract

In this paper, a sudden growth of reactive power demand at a load bus accompanied with the single branch (power transformer or transmission line) outage contingency is studied to determine the critical line at which the weak bus is diagnosed with help of Fast Voltage Stability Index (FVSI).

The importance of this work is due to the fact that the power system which is operating under normal mode may be threatened as it may face a sudden increase demand contingency, which may lead to cascading outages, and/or violations of bus voltage which may lead to voltage collapse.

This diagnosis of the weak bus is useful to determine the optimum location for shunt compensation required to improve
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**Index Terms**

- Computer Science
- Circuits and Systems

**Keywords**
Critical branch, Fast Voltage Stability Index (FVSI), weak bus, growth of reactive load bus, voltage collapse, worst case contingency, static voltage security, static security.