

Selecting Critical Contingencies using Reliability Index in Power Systems

Ajit K. VERMA^{(1)*}, A. SRIVIDYA⁽²⁾, Bimal C. DEKA⁽²⁾

⁽¹⁾ Reliability Engineering Group, Indian Institute of Technology, Mumbai, India

⁽²⁾ Assam Engineering College, Jalukbari, India

Abstract

In composite power system adequacy assessment, the selection of contingency involves the determination of possible and reasonably likely outage events and a means of pre-selecting the most severe of these events for testing. For an n component system, when a two-state model of each component is used, the number of outage events is 2^n . Consideration of all outage events for large n will result in a large increase in the required computational time. Contingency screening is, therefore, essential to reduce the number of such outages. This paper presents an algorithm to identify the critical outage events using a reliability-based index from the list of all possible contingencies. The selected critical contingencies are then ranked with respect to their severity.

Keywords: Reliability, Power system, Reliability index, Contingencies, Algorithm