

Area-based COI-referred transient stability index for large-scale power system

ABSTRACT

This paper presents a new transient stability index called the Area-based COI-referred Transient Stability Index for a large electrical power system. A large power system is divided into smaller areas depending on the coherency of the system due to disturbances before the index is applied on the system. The proposed index is defined by associating with each area of the power system an equivalent inertia representing the total inertia of the generation located in that area. Assuming that each area is coherent, it is possible to assimilate its behavior to that of a single large machine with the same inertia and generation. It also offers a direct means of deriving the centre of inertia (COI). The COI provides very useful information for tracking the stability of interconnected areas. So, instead of assessing all generators' rotor angles. Simulations on the large practical power system show the effectiveness of the proposed index.

Keyword: Transient stability index; Transient stability assessment; Time domain simulations