



Intisari

Akses ke jaringan transmisi dibuka secara luas untuk menyalurkan daya listrik dari entitas satu ke entitas lain melalui jaringan yang dimiliki oleh pihak ketiga (*power wheeling*). Dalam implementasi *power wheeling* perlu adanya evaluasi keandalan sistem, karena besar daya listrik yang ditransaksikan dapat menurunkan keandalan sistem. Evaluasi keandalan sistem terdiri atas kombinasi unit pembangkitan dan unit transmisi (Hirarki Level II), atau sering dikenal sebagai *composite system*.

Penelitian ini menjelaskan analisis indeks keandalan dengan menggunakan metode analitik numeris dengan perhitungan probabilitas dan frekuensi kejadian *outage* dan perubahan indeks keandalan karena adanya implementasi *power wheeling* dengan data sistem IEEE 6 Bus RBTS (Roy Billinton Test System). Perhitungan indeks keandalan kaitannya dengan transaksi *power wheeling* dalam penelitian ini yang digunakan adalah *ELC* (*Expected load curtailed*) dan *EENS* (*Expected energy not supplied*).

Hasil penelitian menunjukkan bahwa perubahan indeks keandalan sistem dipengaruhi oleh besar daya implementasi *power wheeling*, aliran daya pada sistem (topologi / konfigurasi sistem), lokasi dan jarak antara *wheeling source* dan *wheeling sink*. Semakin besar daya pada *power wheeling* keandalan sistem akan menurun / indeks keandalan sistem ELC dan EENS naik.

Kata kunci : Indeks Keandalan, Sistem Komposit, *Power Wheeling*



Abstract

Access to the transmission network is opened widely to distribute electrical power from one entity to another entity through a network owned by a third party (power wheeling). In the implementation of power wheeling is necessary to evaluate the reliability of the system, because large electric power transaction can degrade system reliability. Power system reliability evaluation consists of combination generation and transmission facilities (Hierarchy Level II), or commonly known as composite system.

This research describes the analysis of the reliability indices using the numeris analytical method by calculating probability and frequency of outage occurrence and change of reliability indices caused by power wheeling with system data IEEE 6 Bus RBTS (Roy Billinton Test System). Reliability indices calculation associated with the power wheeling transactions that are used in this study is the ELC (Expected load curtailed) and EENS (Expected energy not supplied).

The results showed that change of power system reliability indices affected by large electric power in the implementation of power wheeling, power flow on the system (topology/configuration of the system), location and distance between the wheeling source and wheeling sink. The greater amount power of wheeling transaction system reliability will decrease (system reliability indices ELC and EENS increases).

Keywords : Reliability Indices, Composite System, Power Wheeling