

## ABSTRAK

*Menurut pengamat energi dari Institute for Essential Services Reform (IESR) jumlah konsumen listrik di Indonesia naik rata-rata pertahun 6-7% yang diikuti dengan meningkatnya luas daerah pelayanannya. Jaringan yang semakin luas berbanding lurus dengan potensi terjadinya gangguan pada sistem transmisi dan distribusi. Gardu Induk 150 KV Rembang merupakan bagian sistem kelistrikan Interkoneksi Jawa Bali pada Jawa Tengah bagian Utara yang mensupply listrik ke daerah Rembang dan sekitarnya. Gardu Induk 150 KV Rembang tanggal 24 mei 2019 feeder RBG 01 mengalami gangguan di belakang recloser RB1-32 dan tercatat pada 2019 PMT telah trip sebanyak 4 kali. Selain itu, telah terjadi perubahan perangkat berupa pergantian trafo II. Masalah tersebut menunjukkan adanya potensi gangguan yang tidak terantisipasi oleh sistem proteksinya yakni Over Current Relay dan recloser.*

*Kajian ini mengevaluasi setting proteksi OCR outgoing 20 KV dan recloser pada trafo II feeder RBG 01 Gardu Induk 150 KV Rembang . Skenario yang digunakan berupa perhitungan dengan variasi besar arus hubung singkat berdasarkan % jarak, serta perhitungan setting OCR dan recloser dengan standar IEC 60255. Arus setting pada peralatan proteksinya diatur berdasarkan kuat hantar arus (KHA) dan arus beban pada recloser. Koordinasi setting proteksi hasil resetting ini akan dibandingkan dengan kondisi di lapangan.*

*Kondisi existing (lapangan)OCR outgoing feeder RBG 01 nilai TMS OCR = 0,228 detik, Iset = 480 A, dan t op = 0,3 detik. Kondisi existing OCR recloser nilai TMS OCR = 0,120 detik dan Iset = 400 A. Hasil Resetting koordinasi OCR outgoing feeder RBG 01 didapatkan nilai TMS OCR = 0,135 detik, Iset = 585 A, dan t operasi = 0,3 detik. Kondisi resetting OCR recloser didapatkan nilai TMS OCR = 0,10 detik, Iset = 240 A dan t operasi = 0,198 detik. Kondisi resetting telah memenuhi standar IEC 60255 karena waktu kerja recloser lebih kecil dari waktu kerja outgoing.*

**Kata Kunci :** *sistem distribusi tenaga listrik, arus hubung singkat, OCR, recloser*

## **ABSTRACT**

*According to energy observers from the Institute for Essential Services Reform (IESR) the number of electricity consumers in Indonesia has increased by an average of 6-7% annually followed by an increase in the area of its services. An increasingly broad network is directly proportional to the potential for interference with the transmission and distribution system. The 150 KV Rembang substations is part of the Java-Bali Interconnection electrical system in northern Central Java that supplies electricity to the Rembang and surrounding areas. Rembang 150 KV substation on May 24, 2019, RBG 01 feeder experienced a disturbance behind the RB1-32 recloser and it was recorded that in 2019 PMT it had been tripped 4 times. Besides, there has been a change in equipment in the form of transformer II. These problems indicate the potential for interference that is not anticipated by the protection system, namely Over Current Relay and recloser.*

*This study evaluates the setting of an outgoing 20 KV OCR protections and recloser on transformer II RBG 01 feeder Rembang 150 KV substation. The scenarios used are calculations with large variations of short-circuit current based on % distance, as well as the calculation of OCR and recloser settings with IEC 60255 standards. Setting currents in the protection equipment is regulated based on current conductivity (KHA) and load current on the recloser. The coordination of the protection settings resulting from this resetting will be compared to the conditions on the ground.*

*Existing (field) OCR outgoing feeder RBG 01 condition TMS OCR value = 0.228 seconds,  $I_{set} = 480$  A, and  $t_{op} = 0.3$  seconds. The existing OCR recloser condition TMS OCR value = 0.120 seconds and  $I_{set} = 400$  A. The results of OCR coordinating outgoing feeder RBG 01 obtained TMS OCR value = 0.135 seconds,  $I_{set} = 585$  A, and  $t_{operation} = 0.3$  seconds. OCR recloser resetting conditions obtained TMS OCR value = 0.10 seconds,  $I_{set} = 240$  A and  $t_{operation} = 0.198$  seconds. The resetting conditions have met the IEC 60255 standard because recloser working time is smaller than outgoing work time.*

**Keywords:** *electric power distribution system, short circuit current, OCR, recloser*