Quantifying Disturbance Level of Voltage Sag Events

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Abstract—This paper presents an application of fuzzy logic technique to quantify the system voltage sag disturbance level. It describes the fuzzy sets and IF-THEN inference rules involved in a process of providing a disturbance level to a voltage sag event based on the voltage dip windows defined by the South African utility ESKOM. The sag classes in the windows are exploited in defining the fuzzy membership functions which represent different classes of voltage depression and durations. The output of the fuzzy reasoning process provides a single factor that indicates the relative disturbance level of a voltage sag event. Power quality monitoring results are used to test the proposed method and the probability density distributions of the disturbance levels are presented.

Index Terms—disturbance level, fuzzy set, voltage sag, site index.