

ABSTRACT

Name : Wahyu Abdul Majid
Study Program : Electrical Engineering
Title : Analysis of Lighting Quality on Harmonics (Case Study at TMC Hospital)

The quality of lighting in buildings, especially hospitals, greatly affects user comfort, safety, and work efficiency. Modern lighting systems often use energy-efficient LED lights, which can generate harmonics in the electrical system. This study analyzes the relationship between lighting quality and harmonic levels in several rooms at TMC Tasikmalaya Hospital. Measurements of light intensity (lux), current harmonics (THDI), and voltage harmonics (THDV) were taken in areas such as the emergency room, inpatient room, and polyclinic. Data analysis used statistical methods and Pearson correlation to assess the relationship between variables. The results show that some rooms do not meet the lighting standards of SNI 6197:2011. In addition, current harmonics (THDI) exceeded 35% in some locations, potentially affecting lighting performance and efficiency. The Pearson correlation coefficient showed a positive relationship between THDI and lumen ($r = 0.94$), lumen and current showed a positive relationship ($r = 0.97$), and THDI and current showed a positive relationship ($r = 0.94$), indicating that an increase in lumen correlates with an increase in harmonic distortion. This study concludes that the more LED load the higher the level of harmonic distortion, but this does not adversely affect the quality of the diffused lighting.

Key words: harmonics, lighting, pearson correlation, hospital