

ABSTRACT

Train is one of the land transportation used to transport large quantities of mining goods, such as coal. The loading process can be unevenly distributed and can damage components. Therefore, it is very important to know the load distribution analysis. This study aims to analyze the uneven load distribution on coal wagon using finite element method with ANSYS Mechanical. The data collection process was carried out by surveying into the field to consult directly with team from PT. Kereta Api Indonesia and reading literature related to the research. 3-dimensional models were made based on the actual wagon dimensions. The load is assumed as the peak of mound inclined towards bogie 2 (rear). Scenarios were made into 3 types, underload, maximum, and overload.

Based on the analysis results, it was found that bogie 2 experienced excessive loads compared to bogie 1. The entire load distribution of the bogie 1 wheels had almost the same value for each axle. In all scenarios, a wheel that has safety rating below 100% is always found, which means there must be an unsafe wheel. When the condition is below the maximum load limit, only wheels 7 and 8 have a safety rating below 100%, namely 96,8% and 95,82%. When conditions are full and overload, all bogie 2 wheels experience a low safety rating. Wheels number 7 and 8 with overload condition show the lowest safety rating with a value of 80,81% and 80,58%, respectively. The majority of safety rating results that obtained in the static analysis are almost the same as the field measurement data.

Keywords: *Finite Element Method, coal wagon, load distribution, safety rating.*