ABSTRACT

Efforts to reduce the quantity of waste carried by the Citarum river flow are increasing every year. This is because the garbage carried by the citarum river in large quantities can cause flooding. This study is one solution to this problem by designing ship on the Automated River (AURI) Cleaner machine. The vessel on the AURI Cleaner is optimized so that the engine can work stable and the motion of the ship is not too active. The control parameters that will be optimized to produce stable results are the type of vessels and the length of the vessels. The types of vessels used in this study are Catamaran, SWATH and Monohull. While the length of the ship was chosen based on the Enlarge Ship Concept method by increasing the size of the ship by 25% per level and rounding down so that the size of 5 meters, 6 meters and 7 meters was chosen. The response variable is the aspect of seakeeping criteria, namely pitching, rolling and heaving and then optimized using the Taguchi method. The Taguchi method cannot optimize multiple responses at once, so the Gray-Relational Analysis approach is used to overcome multi-response problems. Referring to data processing that has been done, the optimal parameter for seakeeping criteria in the pitching, rolling and heaving are Catamaran Vessel Type with 7 meters Length of the Vessel. The parameters of the type of vessel and the length of the vessel have a significant influence on the response with P-value respectively 0.002 and 0.006 calculated by ANOVA test. After using the Post-hoc Fisher Least Significant Difference (LSD) test, it is known that changes in the level of Ship Types from Monohull to Catamaran and changes in Ship Length from 7 meters to 5 meters have a significant impact on simulation results.

Keyword*: *Enlarge Ship Concept, Seakeeping Criteria, Taguchi Method, Grey-Relational Analysis