The solution to the ship motion problem is via the solution of the six degree of freedom system. The Nomoto model is used to define and simulate the movement of the ship. In this study, the Nomoto model was used to define the transfer function of the ships rudder system. Model simulation is done in Matlab / Simulink program. In order to improve the control in the generated simulation, the classical PID method is used first. However, it has been found that the conventional PID method is insufficient to satisfy the criteria for the success of the control of the ships rudder system. In this stage, the coefficients of the PID controller need to be optimized. Genetic Algorithm is used in the optimization of the PID coefficients. PID controller coefficients obtained by using Genetic Algorithm are applied to ship steering system simulation. The output angle value that the system produces against 1 degree angle input was observed. As a result of this paper, when comparing the system outputs obtained by the Classical PID method and the Genetic Algorithm-PID method, it was observed that the PID coefficients optimized by the Genetic Algorithm are better to the classical PID method in the ships rudder system control.