KM. Amelia Wasaka is a merchant ship owned by PT. Wasaka Sudarma Putera. This vessel operates in Surabaua – Kalimantan with 164 tonnes in Gross Tonnage (GT). During it’s operation, this vessel uses single main engine with 421 PK.

This ship is used as merchant ship with loading capacity 164 tons. It’s intended for the ship to have more cargo capacity due to the rapid growth of shipping trade. Therefore, the owner decided to add 6 meters of vessel lenght. The modification and additional length is planned in cargo room, between fram 34-35.

This research is subjected to give a description to the ship’s owner about the impact of modification. Some influences and impacts upon the ships are, vessel’s speed and operational cost of the ship. The research is done by using some calculations, such as : recalculating ship’s capacity, ship’s strenght, freeboard, speed, and production cost of modification. In ship resistance’s calculation, 3D modelling is created in hullspeed. From the calculation, can be described about vessel’s speed reagrding with main engine capacity.
From Hydromax’s calculation, volume of cargo room can be obtained. This research also provide best alternative if in case the additional length can decrease the ship’s performances, thus it can not compete with other similar vessel.

Key Words: ship’s length addition, ship’s load, ship', Hullspeed, Hydromax.