Air-conditioning system is one system that works on ships and is designed for comfort and health of the ship operator (ABK). KM Kencana owned shipping company PT. Nusa Tenggara malfunctions in refrigeration systems. So there should be the turn of the new room cooling system. One of the damage is marked by the burning of the air-conditioner compressor Electromotor

In this final Project, re-design will be done as a material consideration in the turn of the new system by making repeated through the cooling load calculation using the standard ISO: 7547 "Ships and marine technology-Air-conditioning and Ventilation of accommodation spaces - Design conditions and basis of Calculations" and analyze damage to the compressor as a preventive action analysis Root Cause Analysis (RCA), including Fault Tree Analysis (FTA) and Failure Mode Effect Analysis (FMEA) With the method above there is a difference digunakan cooling load requirement. Air conditioning machines installed in the vessel, amounting to 68.78 kW, according to the calculations of 42.06 kW and the damage caused due to compressor failure on the Thermostat and Expansion Valve

Keywords: Refrigeration expenses, RCA, FTA, FMEA