# Analysis of Damage Occurred in the Accommodation Engine Cooler Room That Can Cause Changes in Temperature on the MV. Pan Energen

Soleh Uddin[1], Laila Puspitasari A.[2], Amsalova Simanjuntak[3]
[1, 3] *Prodi Teknika*
[2] *Prodi Ketatalaksanaan Angkutan Laut dan Kepelabuhanan*
*Sekolah Tinggi Ilmu Pelayaran, Jakarta*
*Jl. Marunda Makmur No. 1 Cilincing, Jakarta Utara. Jakarta 14150*

**Abstract**

Ships hold an important role in the distribution of goods and passengers. Inside the ship, there is a cooling machine that is used for food or other accommodation. This study examines the causes of leaky engine coolant pipes and frost on the evaporator pipes. The purpose of this study was to determine the cause of the leaky engine coolant pipe and determine the cause of the presence of ice on the evaporator pipe. This type of research is qualitative. From the results of the study it was concluded that the cause of leakage of the cooling machine pipe is the installation of bolts that are not tight enough, the pipe is rusty and has been damaged. Then the cause of the ice on the evaporator pipe is the amount of air that contains water on the pipe, then often the door of the engine cooler is open for a long time.



***Keywords :*** *engine coolant, temperature, accommodation room*
**Permalink/ DOI :** https://doi.org/10.36101/pcsa.v1i1.109

## 1. INTRODUCTION

The voyage will be able to reach its destination successfully, on time, safely and safely if all infrastructure and supporting components are adequately met. The supporting components can be in the form of infrastructure which is directly related to loading and unloading operational tools, navigation, machinery and can also be in the form of supporting the health of the crew. One of the most important supports related to welfare and health is the quality of temperature, quantity of temperature, and air circulation in the ship's accommodation room.

The temperature and air circulation must be of high quality even if the ship is in an area that is experiencing summer or winter. The temperature and the air must be cool and comfortable for the body as well as the circulation and air temperature which gives effect to the comfort of the body, because the temperature in the accommodation room affects the sleep quality of the crew on board. If the need for temperature and air temperature is as desired, even if the ship sails for a long time, then the crew does not need to worry about the comfort of the accommodation temperature on the ship. If the temperature is comfortable and cool, the crew will feel comfortable and prosperous so that the ability to work can be done better. In order to keep the temperature and air quality in the accommodation room, it is needed a tool that supports it. Need to have a cooling machine that meets work standards..

## 2. METHODS

To get complete, objective, accurate, and accountable data, to find a true picture and perspective, certain techniques are needed to collect the data.The technique used to obtain data related to cooling machine installation problems in writing this thesis is Observation, Interview, Documentation and Literature Study.

Time of observation in MV. PAN ENERGEN with management company POS SM CO., LTD. RESEARCH RESULT based on observation on the MV. PAN ENERGEN, many problems that occur in the engine

coolant, such as; System leakage which causes the refrigerant to be discharged, the v-belt on the fan motor is broken so that the fan motor does not work normally, there are frost on the evaporator pipe, and also the corrosion and leaky pipes.

The worst consequence of the damage to the cooling engine was that the accommodation room became hot and the entire crew had difficulty breathing in the entire accommodation room. All of the problems began with the lack of responsibility of the Engineers in authority and also due to the inconsistency of the Engineers responding to any problems or difficulties that exist. If this continues, it will be very detrimental for the crew in particular and also for the company as a responsible party.

## 3. RESULTS AND DISCUSSION

When the author has experienced several problems that occur in the installation of the cooling machine. These problems will be described in detail based on the events experienced by the writer on MV. PAN ENERGEN includes:

1. The engine coolant pipe is leaking

This happened when the ship sailed from India to Argentina, while doing daily work in the engine room as well as routine checking of all machinery both the main engine and auxiliary machinery, a fire alarm sounded suddenly, and after checking it turned out that the alarm originated from the cooling room (air conditioner). When entering the engine room it was clear that all the rooms were full of leaking freon gas.When checking is carried out on the installation of the cooling machine, there was a leak at the installation of the cooling machine, there was a leak in the pipe that had been welding.

2. V-belt fan motor is broken.

On February 20, 2018, the MV PAN ENERGEN ship sailed from Arabia to Oman, when the writer was having dinner with the crew, suddenly the room felt hot and there was no air circulation. The author and Engineer III immediately go to the engine cooler. Before reaching the engine room we found the filter for air circulation in the accommodation had fallen because it did not stick due to no suction from the fan. when we arrived at the engine room we saw the compressor still running but Engineer III checked the motor fan inside the AHU (air handling unit) and when it was seen the V-belt motor fan had broken and the motor kept running. The broken V-belt results in the fan not rotating at normal speed, not even rotating at all. So there is no air circulation in the accommodation room and this causes the room to heat up and the crew will feel hot.

3. There are frost on the evaporator pipe

On July 4, 2018, the MV PAN ENERGEN ship sailed from India to China, when the writer was on guard duty at 12.00-16.00 with Machinist II, as usual doing routine checks on all machinery on board both the main engine and auxiliary machinery, before making a change of guard. This is done to determine the final condition of the machines, by looking at the temperature, pressure, which occurs on the thermometer and manometer. This condition will be recorded in the engine log book, which assists the Engineer in machining supervision. When checking is known that an abnormal event occurs in the installation of the cooling machine, it is shown by the increase in temperature in the air to the accommodation where the normal temperature of 27 ° C rises to 30 ° C. After that Engineer III checks the evaporator and it turns out that there are frost on the evaporator pipe. The presence of ice on the evaporator pipe affects the absorption of less than maximum heat due to ice that covers the evaporator pipe where there are freons in it.

## 4. CONCLUSION

1. The occurrence of coolant pipe leakage is caused by:
   a. Improper mounting of bolts or less tight
   b. Broken and rusted pipe
2. The occurrence of a v-belt fan motor is broken due to:
   a. Overheating hits the v-belt
   b. Adjustment on the v-belt is incorrect
3. The presence of ice on the evaporator pipe is caused by:
   a. The amount of air that contains water on the evaporator pipe
   b. Often the door to the engine cooler opens for a long time.

From the conclusions about the cooling system above, the authors provide some suggestions for problems that occur in the cooling system as follows:

1. Cooling engine pipe leaks

It is expected that the driver responsible for the installation of the cooling machine will pay more attention to cooling machine tools and deal with leaks in the cooling machine installation pipes in accordance with the engine coolant manual. In dealing with damaged pipes, it is better to replace the leaked pipe with a new pipe and the quality of the pipe material must be as recommended by the maker or creator of the machine, so that the problem of reducing freon can be overcome. Thus the maximum results will be obtained. For machinists guard, oiler and cadet to always maintain and ensure the condition of the cooling machine is working in normal conditions by checking and journalizing pressure on the pressure gauge and temperature on the engine coolant regularly.

2. The occurrence of v-belt motor fan is broken

It is expected that the driver responsible for the installation of the cooling machine will pay more attention to the equipment especially the fan motor and in dealing with v-belts breaking on the fan motor, preferably by installing the v-belt in accordance with the leeway listed in the user guide. Always check every week by noting in a special cooling machine journal whether the v-belt is still in good condition or not, as well as providing care by spraying the v-belt with a special spray that has been provided on board.

3. The presence of frost on the evaporator pipe

The author's advice on thickening frost on the evaporator pipes is to socialize the procedures for entering the accommodation cooling room to all crew members. To the driver to defrost or clean the evaporator pipe at the installation once a month even though there are only a few blobs of ice attached to the evaporator pipes, because this will still prevent the freon gas from absorbing heat in the accommodation cooler, and carry out routine checks. in the tightness of the door of the accommodation cooling room to prevent free air entering the accommodation engine cooling room which can result in thickening of frost on the evaporator pipes.

## REFERENCES

Adji, R. 1994. *Mesin Pendingin*. Persatuan Pelaut Indonesia : Jakarta.

Handoko. 1987. *Alat Kontrol Mesin Pendingin*. PT. Ictiar Baru : Jakarta.

Karyanto, E. dan Paringga, Emon. 2005. *Teknik Mesin Pendingin*. Restu Agung : Bandung.

Manual Instruction Book. 2008. *AIR COND' NEW CENTURY 0108202*. STX : Korea.

Simatupang, Desamen. 2010. *Pedoman Kerja Mesin Pendingin*. STIP : Jakarta.

Sumanto. 1998. *Dasar-dasar Mesin Pendingin*. Andi : Yogyakarta.

KBBI. 2017. *Pengertian kerusakan*. Kongres Bahasa Indonesia :Jakarta.