67. A Study on the Development of Real time Monitoring System for Oil Mist of Ship Diesel Engine

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A failure of a ship diesel engine brings about a serious trouble against safe voyage of the

ship. In addition to this, it frequently induces a lot of serious economic and ocean environmental damages. In order to avoid the engine failure a monitoring device is needed by way of detecting engine states. There are two types of engine monitoring systems which have been used for monitoring the engine operating states, such as oil mist detector type and bearing sensor type. One of them must be on board by the IMO (international maritime organization) rule and oil mist detector type is more attractive than bearing sensor type.

However, the conventional oil mist detectors take a simple structure which has only one pair of photo sensors to detect the opacities of oil mists within six or more crankcases of the engine. It consumes much time until it searches a failed crankcase, monitors an alarm level, and drives an alarm signal. Thus they may cause an instantaneous damage to the corresponding crankcase. That is, it has a shortage not to detect a failed crankcase in real time.

In this thesis, a method to reduce the overall time required for searching and monitoring of a failed crankcase of ship diesel engine is proposed. It is the method to detect the opacities of oil mists of crankcases of each engine compartment at the same time. In order to implement the suggested monitoring system, a new design structure is also suggested and implemented in view of hardware and software. It comprises five pairs of sensors and the corresponding mechanical structure. A prototype of the oil mist monitoring system for experiments is developed and it is used for the verification of the suggested method with the viewpoint of real time monitoring. In experiments the opacity of cigarette smog is used instead of that of oil mist because the generation of oil mist is very difficult in academic laboratory. The experimental results using smog are evaluated in qualitative sense and finally the overall conclusion is demonstrated.