

Industrial Research Project Title	Combustion Turbine and Stream Turbine Electro-Hydraulic Control Oil System Problem Solving and Reliability Improvement
Industrial Research Project Credits	6
Candidate	Mr. Somsiang Jantasee
Supervisors	Dr. Sombun Charoenvilaisiri Mr. Sujin Thongthavonsuwon
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Abstract

The main object of this industrial research project is that to solve problems and to improve the reliability of the production procedure. The research is focused on finding out what are the main causes of the problems of hydraulic oil control system, which is functioning in gaseous and steam turbines. Filters in many valves are regularly blocked and it is a problem that is now happening to the hydraulic oil control system. As the result, there was a survey of this topic and the related data was collected, then the data was analyzed based on the information of hydraulic oil checking in order to seek out the real problem. According to the result of the hydraulic oil inspection, substance of copper was found in hydraulic oil and water, and its quantity was over the standard. The number of copper should not be more than 20 parts per million by volume and water should not be more than 0.15 percent by volume. Yet, the latest finding shows that there were 92 parts per million of copper and 0.30 percent of water by volume.

By analyzing the causes of this problem, there are 5 possible causes: Hydraulic oil cooler, type of material that used in making tanks and so on, filter, hydraulic oil itself and piping of oil. The tube of the cooler seemed to be the most possible cause as there was a leaking in the area, then some water could enter into the system. Later on, the reaction between the water and iron made rust within the tank. Besides, the reaction between water and oil also produced a kind

of acid. The effect of this acid is to corrode the copper tube. Thus, the quantity of copper and water could be found in hydraulic oil, which was higher than the standard, and the rust blocked the filter. According to the problem, there is a solution by focusing on 3 main parts as follows:

1) To find out the solution, this part is composed with repairing the cooler's tube and coating its surface. 2) To improve the reliability of the procedure, this is to modify breather and the filter in terms of its technical regulations 3) To prevent the same problem, this part is composed with maintain management that covers routine maintenance and preventive maintenance.

In conclusion, after the solution was carried out, the quantity of copper in hydraulic oil of CT skid decreased. The previous number of copper was 92 parts per million, now it has become 3.4 parts per million, which is equal to 96 percent. The previous number of water was 0.30 percent by volume, now it has become 0 percent by volume, which is equal to 100 percent. Regarding ST skid, there were no copper and water in there. After the solution, there is no finding of copper or water in hydraulic oil .