Failure Analysis of The Copper Tubes for A Water Heater

by

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Dissertation report submitted in partial fulfilment of the requirements for the
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(Mechanical Engineering)

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CERTIFICATION OF APPROVAL

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Approved by,

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JANUARY 2009

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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MOHD NIZAM B. KAMARULZAMAN

ABSTRACT

The objective of this project is to do failure analysis on the copper tubes for hot water piping system at Resak central processing platform (RCPP).The scope of the study focused on the microstructure analysis of the copper tube. The function of this piping system is to transfer the hot water from water heater (WH 101 and WH 102) to the LQ (living quarters). The use of this hot water is for bathing because the cold condition in the LQ. So, every personnel on platform have choice whether they need cold water or hot water for bathing. Both of these water heaters are operating at 300 kPa @ 70^0C (44 psi @ 150^0F). The Failure Analysis Processes in this project involved microscopic examination, microscopic examination, sample preparation for metallographic and report writing. The methodology apply involved the metallography which covered the preparation of the specimen to reveal the microstructure of the sample. This microstructure is examined under Scanning Electron Microscope (SEM) equipped with an energy dispersive spectroscopy of X-rays (EDS) facility. Further analysis is done based on the data gathered through this experimental work. Final conclusion regarding the cause of the failure occurred is done using the analysis of the result from the experimental work. In addition, at the end of this study some recommendations are proposed in order to prevent this failure from occur again.

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