

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT
An overview: Optimize an air conditioning system with the help of thermo economic analysis

1. Babul Ilm, 2. Sohail Bux, 3. Suman Kumar

1. Research Scholar, Mechanical Department, Agnos College of Technology, Bhopal
2. Principal, Agnos College of Technology, Bhopal
3. Assistant Professor, Mechanical Department, RKDF College of Technology & Research, Bhopal

Abstract

Thermo economics is a discipline, which combines the concept of Exergy method with those belonging to economic analysis. This paper contains literature survey of thermo economic optimizations is to achieve, within a given system structure, a balance between expenditure on capital cost and energy costs, which will give the minimum cost of the plant product.

Keywords: Exergy, Temperature, Humidity.

INTRODUCTION

Air Conditioning is defined as the simultaneous thermal and mechanical control of temperature, humidity, air purity and air motion of an atmospheric environment either for the comfort of human's being or for the proper performance of some industrial or scientific processes.

For this purpose energy economic (thermodynamics) a relatively new field of thermal science, combines a details exergy (II Law) analysis with appropriate cost balance to study and optimize the performance of energy system from the cost point of view.

REVIEW OF WORK CARRIED OUT

The key issue in this paper [1] reports that the components incremental cost for Air Conditioning system may be expressed in terms of exergy losses of the element and also in terms of overall plant running cost.

According to author [2] states that when constructing a system, an attempt should be made to attain the highest possible technical efficiency at the lowest cost, within the existing technical, economic and legal constraints.

Saraf, et al. [3] writes that the minimum total cost should be the criteria for the optimization of chiller of refrigeration machinery.

In paper [4] has outlined the procedure for thermo economic optimization of various processes with the concept of entropy generation minimization.

Vanoli, et al. [5] investigated a tube in tube condenser of a conventional vapor compression heat pump, by using the structural method of thermo economics. In this investigation he shows the influence of the condenser performance on the remaining system components. Approximate correlation is assumed between the local exergy destruction rate in a given component and that of the system as a whole.

Author of [6] used the theory of exergetic cost and shows significant reduction in produce cost with a small increment in investigated cost for an aqua- ammonia absorption refrigeration system.

CONCLUSION

This paper has presented a literature review of optimize an air conditioning system with the help of thermo economic analysis. The analysis and balance are usually formulated for single component of the system. Which the objective functions optimized, subject to given economic and technical constraints. The purpose of thermodynamic is improve analysis of the system by introducing ways of concurrently suggestion improvements.

REFERENCES

- [1] **Filippo de Rossi, Massimo Dentice D' accadia**, "Thermoeconomic optimization of a refrigerant plant" international Journal of Refrigeration, Vol. 21, No Pp 42-54, 1998.

- [2] **Wall Goran**, “On the Optimization of Refrigeration Machinery, Progress in Design and Construction of Refrigeration System”, Purdue International Institute of Refrigeration (IIR) Conference, July 18-21, pp 92-97, 1988.
- [3] **Saraf, G.R., Dhar, P.L.**, “Optimisation of Flooded Chiller Design” Indian Journal of Technology, Vol. 18, pp 214-218, May 1980.
- [4] **Bejan, Adian**, “Entropy generation minimization: The new thermodynamics of finite size devices and finite — time processes” Journal of Applied Physics, Vol. 79, No. 3, Feb 1996.
- [5] **Massimo Dentice d’ Accadia, Laura Vanoli** , “Thermoeconomic- Optimisation of the condenser in a vapor compression heat pump”, International Journal of Refrigeration, Volume 27, issue 4, pp 433- 441, June 2004 .
- [6] **P. K. Sahoo, R. D. Mishra , &A. Gupta**, “Exergoeconomic Optimisation of an aqua – ammonia absorption Refrigeration system”, International Journal of Exergy , Vol.1, No. 1, Pp 82-89, 2004.