



ORIGINAL ARTICLE

RELIABILITY AND PROFIT ANALYSIS OF A GAS TURBINE SYSTEM WITH OPTIMISATION OF ELECTRICITY PRICE OF SINGLE CYCLE FOR DIFFERENT CUT-OFF POINTS

Rajesh¹, Prabhat Kumar Sangal^{*}, Himani² and Gulshan Taneja³

^{*&1}School of Sciences, Indira Gandhi National Open University, New Delhi -110 068, India.

²Department of Statistics, Amity University, Noida -201 313, India.

³Department of Mathematics, Maharshi Dayanand University, Rohtak -124 001, India.

E-mail: prabhat.sangal@ignou.ac.in

ORCID: <https://orcid.org/0000-0001-9821-4637>

Abstract: This paper finds various performance measures such as mean time to system failure, reliability, availabilities (in combined and single cycle), *etc.* for a gas turbine power generating system consisting of one gas and one steam turbine. Initially, both the gas turbine and steam turbine are operating, called working in combined cycle. On failure of gas turbine, the system compulsorily goes to down state whereas on failure of steam turbine, it may be kept in operating mode with only working of gas turbine, called working in single cycle or put to down state according as whether the buyer of the power generating under single cycle is ready to pay higher price or not. Semi-Markov process and regenerative point technique are used to analyse the system under consideration. Optimum price of electricity per unit is obtained for different cut-off points, different failure rate of gas turbine and probabilities of paying higher price in single cycle.

Key words: Regenerative point technique, MTSF, Transition probabilities, Cutt-off points.

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