

## **Exergy Modelling of a Coal-Fired MHD Power Plant**

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**Abstract.** Energy quality can be best measured through the application of the proven method of exergy analysis. Exergy analysis of thermal systems provides a better way to determine the deficient sub-components and also estimate the amount of losses that occurred in such components. The present work models a coal-fired open-cycle Magneto-hydrodynamics (MHD) power generation system in terms of exergy analysis. The exergy analysis is carried out side to side energy analysis in order to determine the components with major energy losses and exergy destruction in the modelled plant. It is observed that the nozzle has the maximum energy losses as well as exergy destruction followed by the generator. Energy losses for the compressor, combustor, air-preheater, seed recovery unit, sulphur removal unit and the stack showed a higher value of energy losses in comparison to that of exergy destruction values in these components. From the exergy point it has been found that the components that require most improvement are the nozzle and the generator.

**Keywords:** Magneto-hydrodynamics, exergy destruction, energy loss,