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| Title: | Undergraduate Student at Department of Mechanical Engineering, University of West Attica, Athens, Greece | |
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| Presentation title: | **Advanced Exergy Analysis of Gas Turbines** | |

Gas turbines are increasingly used nowadays for power generation in many land and maritime applications, so the study of their performance and the design of their components for greater efficiency are of great importance. While operation and performance of thermal systems was traditionally studied by means of energy (or first-law) analysis, during the last decades, exergy (or second-law) analysis has been also applied. According to it, the rate of exergy destruction is calculated at each component of the system and its contribution to the total exergy destruction can be quantified; such information concerns irreversibilities occurring in the system and dictates where to focus aiming to improve performance. Recently, a refined version of this conventional exergy analysis has evolved, namely Advanced Exergy Analysis (AEA). AEA further splits exergy destruction at each component of the system in endogenous and exogenous parts, as well as in avoidable and unavoidable parts. The first split is related to the contribution of the other components to the exergy destruction of the component under consideration, while the second one considers the unavoidable part of exergy destruction within a component that cannot be eliminated even if the best available technology in the near future would be applied; the rest is the avoidable part. Such an approach reveals the potential for improvement at each component, as well as the interactions among system components. In the present work, a realistic test-case is defined based on the data of a heavy-duty commercial gas turbine and its operation at the design point is modeled by a zero-order thermodynamic model. After performing conventional exergy analysis, AEA is applied, the results are assessed, guidelines concerning the potential for improvements are stated and directions for future research are prescribed.

CV

Kyriaki Moschopoulou was born in Piraeus in 1995 and studied Energy Technology at Technological Educational Institute of Athens. Due to the merge of two main technological institutes of Attica, she continues her studies in Mechanical Engineering at the University of West Attica. Alongside, she provides assistance to the Materials Quality Control Department at Natural Gas Company checking up engineering processes in the gas network, using SAP, computer simulation software and additional secretarial support.

She previously did her internship with the same company at the Assets Design & Network Planning Department.

She attended seminars related with her studying field -such as high-tech pumps, computational fluid dynamics, and passive house technology.

She is a native Greek speaker but also speaks English (B2 Cambridge University) and French (B2 DELF). She is interested in studying the field of mechanical engineering in further and gaining useful research experience in power plants or in general thermodynamics.

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