

2nd International Conference and Exhibition on **Industrial Engineering**

November 16-18, 2015 Dubai, UAE

Exergy analysis of a power plant in Abu Dhabi (UAE)

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The standard conditions used for the design of gas turbines are 15°C, sea level atmospheric pressure and 60% relative humidity. In Abu Dhabi, the performance of gas-turbine power plants is therefore affected by its specific atmospheric conditions since they are different from the ISO requirements. The main objective of this research work was to conduct an exergy analysis for a power-generation plant in Abu Dhabi (UAE) in order to investigate the effects of high temperatures and absolute humidity of ambient air on its performance. Our data showed that the temperature had more negative effects on the performance of the plant than the absolute humidity and the combustion chamber was the main source of irreversibility (70.2%). On the other hand, the compressor had the lowest contribution of exergy destruction (12.4%). Compared to the design conditions (T=15°C, RH=60%), our results indicated that in summer conditions (T=43°C, RH=50%), the power plant lost 4.66% of its net power output and 4.61% of its exergy efficiency.

Biography

Zin Eddine Dadach is a Lecturer at Higher Colleges of Technology, Abu Dhabi. He has done PhD in Chemical Engineering from Laval University, Canada. He has skills and expertise in CCS, ASPEN HYSYS, Exergy Analysis and Process Engineering. He has developed a FORTRAN program on Markov analysis of DNA sequences of *psbA* genes of *Synechocystis* PCC 6803 in order to determine which genes might be responsible for divergent behavior of transcription in response to light intensity at Osaka National Research Institute, Japan.

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