

عنوان مقاله:

Simulation and Economic Analysis of Combined Desalinated Water and Power Generation from Associated Gases of Cheshmeh Khosh

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خلاصه مقاله:

Flaring of gas often having high heating value results in considerable economic and energy losses in addition to significant environmental impacts. Power generation through combined gas and steam turbine cycles may be considered as a suitable flare gas recovery process. Thermal sea-water desalination is a process that requires a considerable amount of heat; hence it may be used in downstream of power generation cycles. Energy is the largest section of the water generation cost of all desalination processes. The energy cost of thermal distillation sea-water plants is close to 50-60% of water generation costs. In the current study, the generation of power and desalinated water through the gas turbine cycle, steam cycle, and multistage flash (MSF) method using flare gas of cheshmeh khosh are investigated. The economic parameters related to the different scenarios considered for the production of power and water are evaluated in the current research. According to the economic evaluation carried out, the most economically profitable scenarios for the investigated co-generation plant is generating as much as possible power in the steam turbine and using the remaining heat in the low-pressure outlet steam in the MSF desalination process. The results show that by increasing steam turbine outlet pressure from 3 bar to 78 bar, power and water generation is changed from 697 to 581 MW and 1557 to 2109 m³/h, respectively. Also, by increasing the outlet pressure of the steam turbine from 3 to 78 bar, the total capital cost is changed from 1177 to 1192 MUSD, and the operating cost is changed from 117.85 to 117 MUSD/year. Finally, operating profit will decrease from 300 to 50 MUSD/year, and payback time will change from 3.92 to 4.75 years.

کلمات کلیدی:

Associated gas, MSF, CHP, Operating Profit, Cheshmeh khosh

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