

## عنوان مقاله:

Power Recovery in a Gas Pressure Reduction Station using 3D CFD Modeling of a Twin Screw Expander

## محل انتشار:

دوماهنامه مکانیک سیالات کاربردی, دوره 13, شماره 4 (سال: 1399)

تعداد صفحات اصل مقاله: 13

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## خلاصه مقاله:

The limitation of energy resources in the world has cut the attention of many researchers to find new resources of clean energy and develop methods for recovering exergy losses. Twin screw expander (TSE) is one of the positive displacement machines that has been widely applied in recent years to recover mechanical power from fluids due to its lower installation, operation, and maintenance costs in comparison with common expansion turbines (CET). In this paper, technical and economic conditions of a city gate station (CGS) were studied with the aim of recovering exergy loss using a TSE. A computational fluid dynamic code was used to simulate the three-dimensional fluid flow in the TSE. The simulation results for Shahroud station—a CGS located in the east of Iran—revealed that, unlike CET, flow and pressure fluctuations in different seasons of the year did not put any restrictions on the use of TSE whereby ۸۵.۳% of annual loss exergy was recovered. Economic studies showed that the internal rate of return (IRR) and payback period of TSE utilization were obtained of ۲۷.۶% and ۴.۴ years, respectively, making the investment in CGS stations more practical compared to the CET.

## کلمات کلیدی:

Twin screw expander, City gate station, CFD, Exergy analysis

## لینک ثابت مقاله در پایگاه سیویلیکا:

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