

Accepted Manuscript

Research Paper

Preliminary design and off-design performance analysis of an Organic Rankine Cycle radial-inflow turbine based on mathematic method and CFD method

Ya Zheng, Dongshuai Hu, Yue Cao, Yiping Dai

PII: S1359-4311(16)32254-2

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.036>

Reference: ATE 9238

To appear in: *Applied Thermal Engineering*

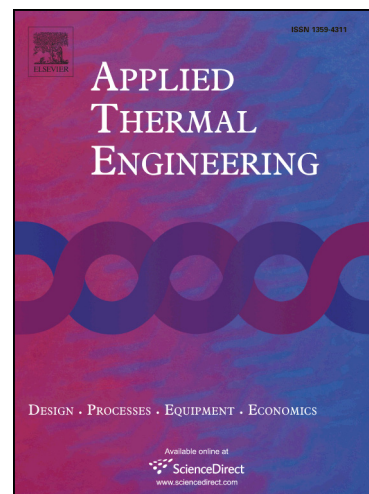
Received Date: 14 February 2016

Revised Date: 25 July 2016

Accepted Date: 8 October 2016

Please cite this article as: Y. Zheng, D. Hu, Y. Cao, Y. Dai, Preliminary design and off-design performance analysis of an Organic Rankine Cycle radial-inflow turbine based on mathematic method and CFD method, *Applied Thermal Engineering* (2016), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.036>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Preliminary design and off-design performance analysis of an Organic Rankine Cycle radial-inflow turbine based on mathematic method and CFD method

Ya Zheng^a, Dongshuai Hu^b, Yue Cao^a, Yiping Dai^{a*}

^a *Institute of Turbomachinery, School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an 710049, China*

^b *China Datang Northwest Electric Power Test and Research Institute. China Datang Corporation, Xi'an 710075, China*

Abstract: As a critical component of Organic Rankine Cycle (ORC) system, the turbine selection has an enormous influence on the system performance. Challenges in the numerical modeling of radial-inflow turbines using high-density working fluids still need to be addressed in order to improve the turbine design and better optimize ORCs. This paper carries out the full design process of the R134a radial-inflow ORC turbine. The 1D design of the candidate radial-inflow turbine is presented in details. Furthermore, commercially-available software ANSYS-CFX is used to perform preliminary steady-state 3D CFD simulations of the candidate R134a radial-inflow turbine. Also a turbine model based on 1D analysis is performed for a number of operating conditions including off-design conditions. The performance prediction codes of an ORC radial-inflow turbine based on mathematic method and CFD method

Download English Version:

<https://daneshyari.com/en/article/4991680>

Download Persian Version:

<https://daneshyari.com/article/4991680>

[Daneshyari.com](https://daneshyari.com)