International Journal of Rotating Machinery

Hindawi

Special Issue on

Design, Optimization, and Selection of Expansion and Compression Machines to Improve Performance of Organic Rankine Cycle Systems

CALL FOR PAPERS

Although investigated since the 1880s, Organic Rankine Cycles (ORC) have received widespread interest in recent years due to the growing concerns regarding the future depletion of fossil fuels and anthropogenic climate change due to CO_2 emissions. For this reason, the exploitation of renewable energy sources and energy saving techniques has become mandatory to meet the energy demands and to limit the production of carbon dioxides, which is directly responsible for global warming. In this context, the increasing attention given to Organic Rankine Cycles is due to their potentiality to exploit low-grade heat sources, such as industrial waste heat and heat from biomass, solar and geothermal plants. The success of ORC plants can be partly explained by their modularity. Moreover, a key feature of these systems is the high technological maturity level of most of their components due to their extensive use in refrigeration applications and other fields. Therefore, unlike conventional power cycles, local, small-scale power generation could be possible with this technology and the number of ORC plants installed worldwide is steadily increasing.

Most of the investigations on ORC systems have been focused on the thermodynamic performance optimization and fluid selection. However, few studies address the design and selection phases of expansion and compression machines to improve performance of Organic Rankine Cycle systems, which is a more reasonable approach than borrowing expanders and other components, like those equipping the lubricant circuits, from automotive or refrigeration applications. This approach allows the efficiency maximization through the use of machines that better match the specific plant operating conditions.

The purpose of this special issue is to publish high-quality research papers as well as review articles finalized to the developed of expansion and compression machines to improve the overall performance of ORC systems. Original, high quality contributions that are not yet published or that are not currently under review by other journals or peer-reviewed conferences are sought.

Potential topics include but are not limited to the following:

- Methodologies for the design and selection of the machines (including thermodynamics properties and cycle analysis)
- Fluid-dynamic modelling approaches (ranging from analytical modelling to CFD)
- Prototyping and experimental developments, activities, and techniques
- Experimental and theoretical analysis, optimization, and validation methods
- Working fluids (including mixtures) and their implications on the machines
- Turbines and volumetric expanders design and optimization
- ORC applications and energy sources
- System optimizations for ORC power plant
- Pumps for organic fluids
- Supercritical CO_2 and novel technologies

Authors can submit their manuscripts through the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/ijrm/dos/.

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Manuscript Due
Friday, 12 May 2017

First Round of Reviews
Friday, 4 August 2017

Publication Date
Friday, 29 September 2017