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Peyman Sindareh-Esfahani, S. Sepehr Tabatabaei, Jeff k. Pieper

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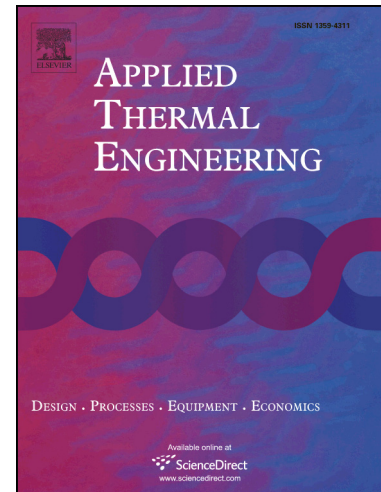
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# Model Predictive Control of a Heat Recovery Steam Generator during Cold Start-up Operation Using Piecewise Linear Models

Peyman Sindareh-Esfahani<sup>a,\*</sup>, S. Sepehr Tabatabaei<sup>b</sup>, Jeff k. Pieper<sup>a</sup>

<sup>a</sup> Department of mechanical and manufacturing engineering, schulich school of engineering, university of Calgary, 2500 University Drive NW, Calgary, AB T2N 1N4, Canada.

<sup>b</sup> Department of electrical engineering, Amirkabir university of technology, Tehran, Iran.

## Highlights

- Piecewise linear model for cold start-up.
- Experimentally validated data from simulations.
- Cold start-up optimization using both linear and nonlinear models.
- Application of model predictive control.
- Optimization of the modelling and control processes.

## Abstract

Proposed is a new optimization scenario for the cold start-up of a heat recovery steam generator in a combined cycle power plant. A nonlinear model consisting of all components of a heat recovery steam generator including economizer, drum, and superheater is considered as the main plant. Another system is identified based on prediction error method to design the control inputs of the system. The model obtained based on prediction error method is a piecewise linear model validated using a wide set of experimental data acquiring from a heat recovery steam generator during cold start-up. In order to improve the performance of the heat recovery steam generator cold start-up, a quadratic cost function is proposed based on wall temperature of superheater, drum pressure, exhaust

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