

Low load operating protocol investigation of a 620MWe power boiler using a fast Eulerian-Eulerian CFD model

B.T. Rawlins, R. Laubscher*, P. Rousseau

Department of Mechanical Engineering, Applied Thermal-Fluid Process Modeling Research Unit, University of Cape Town, Library Rd, Rondebosch, Cape Town, 7701, South Africa

Abstract

This template helps you to create a properly formatted L^AT_EX manuscript.

Low load operation of utility boiler

Keywords: CFD, Eulerian-Eulerian, Boiler, Low-load operation

Nomenclature					
Symbol	Quantity	Unit	Greek letters		
			α_p	Particle absorption coefficient	m^{-1}
A	Area	m^2	g	Gravity	m/s^2

1. Introduction

If the document class *elsarticle* is not available on your computer, you can
5 download and install the system package *texlive-publishers* (Linux) or install the
L^AT_EX package *elsarticle* using the package manager of your T_EX installation,
which is typically T_EX Live or MikT_EX.

Usage. Once the package is properly installed, you can use the document class *elsarticle* to create a manuscript. Please make sure that your manuscript follows

*Corresponding author

Email address: `ryno.laubscher@uct.ac.za` (R. Laubscher)

10 the guidelines in the Guide for Authors of the relevant journal. It is not necessary to typeset your manuscript in exactly the same way as an article, unless you are submitting to a camera-ready copy (CRC) journal.

Functionality. The Elsevier article class is based on the standard article class and supports almost all of the functionality of that class. In addition, it features
15 commands and options to format the

- document style
- baselineskip
- front matter
- keywords and MSC codes
- 20 • theorems, definitions and proofs
- lables of enumerations
- citation style and labeling.

2. Mathematical model

The author names and affiliations could be formatted in two ways:

- 25 (1) Group the authors per affiliation.
(2) Use footnotes to indicate the affiliations.

See the front matter of this document for examples. You are recommended to conform your choice to the journal you are submitting to.

3. Numerical setup

30 Validation separately mention the rates/loadings - give results for 40% case inputs Low Ultra low load inputs

Table 1: Utility boiler fuel characteristics

Fuel constituent	Fraction	Unit
<i>Ultimate analysis - (DAF)</i>	-	-
Carbon	0.7753	kg/kg_{fuel}
Hydrogen	0.0415	kg/kg_{fuel}
Nitrogen	0.0181	kg/kg_{fuel}
Oxygen	0.1474	kg/kg_{fuel}
Sulphur	0.0175	kg/kg_{fuel}
<i>Proximate analysis - (AR)</i>	-	-
Fixed carbon	0.340	kg/kg_{fuel}
Volatile matter	0.196	kg/kg_{fuel}
Ash	0.4090	kg/kg_{fuel}
Moisture	0.0550	kg/kg_{fuel}
Energy content - (DAF)	Value	
Higher heating value	15070	kJ/kg_{fuel}

3.1. Model validation

The validation of the proposed model was conducted for three steady state MCR loads of 100%, 80% and 60%. The

Figures of the Histograms and CO graphs as in paper Data plots and overall performance of the model Inputs for the various loads table

ghff

4. Results & discussion

5. Conclusions

6. Bibliography styles

There are various bibliography styles available. You can select the style of your choice in the preamble of this document. These styles are Elsevier styles

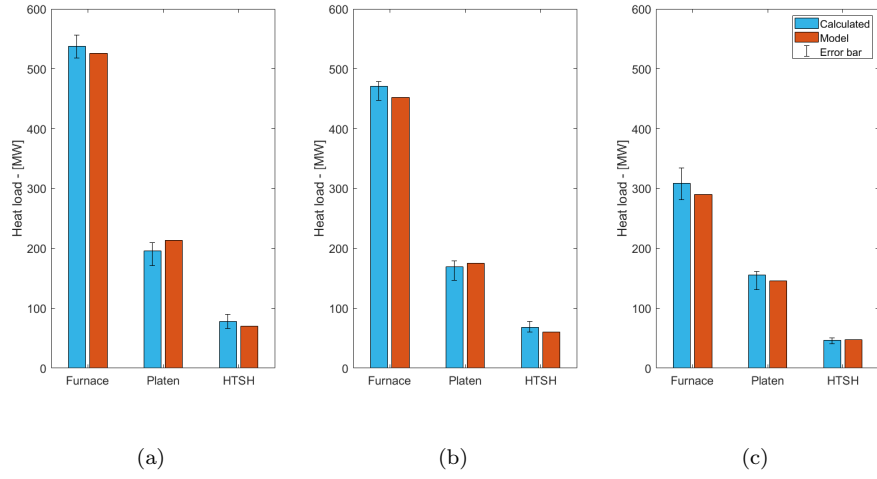


Figure 1: Validation of the experimental and models heat load to the furnace, PSH and HTSH for steady state loads of a) 100% MCR, b) 80% MCR and c) 60% MCR

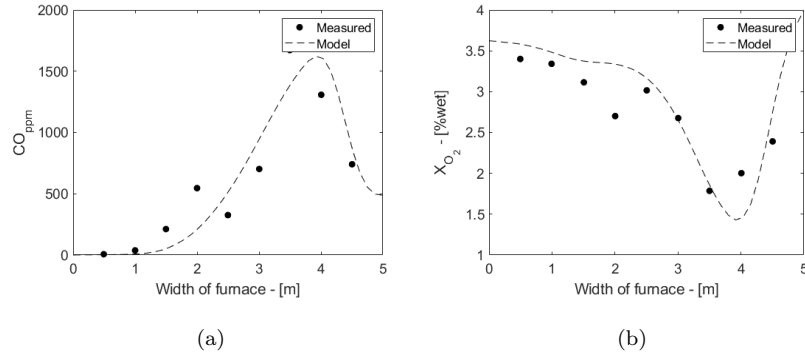
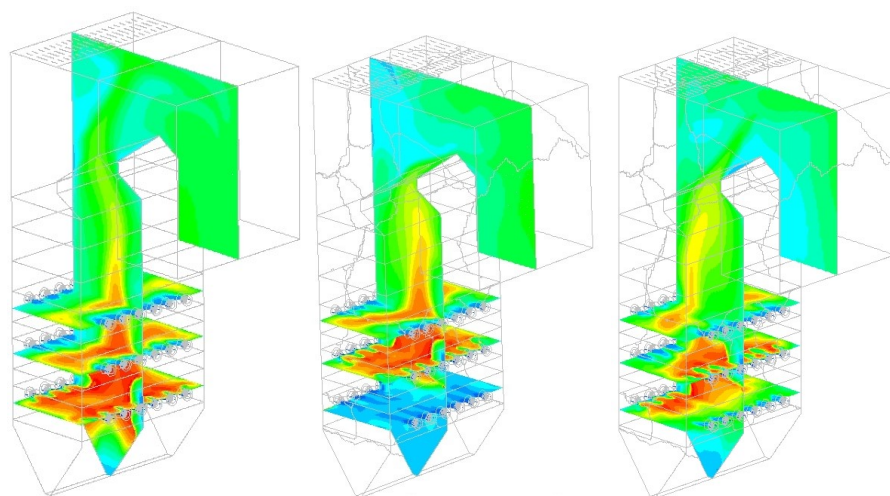
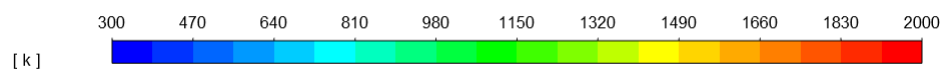


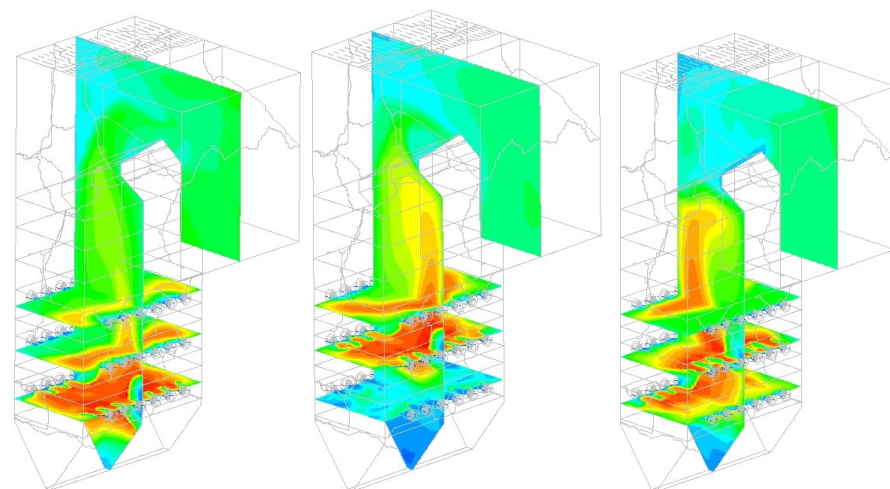
Figure 2: Experimentally calculated CO and O_2 concentration predictions at a height of 37.5 (m)



(a)

(b)

(c)



(d)

(e)

(f)

Figure 3: Hi

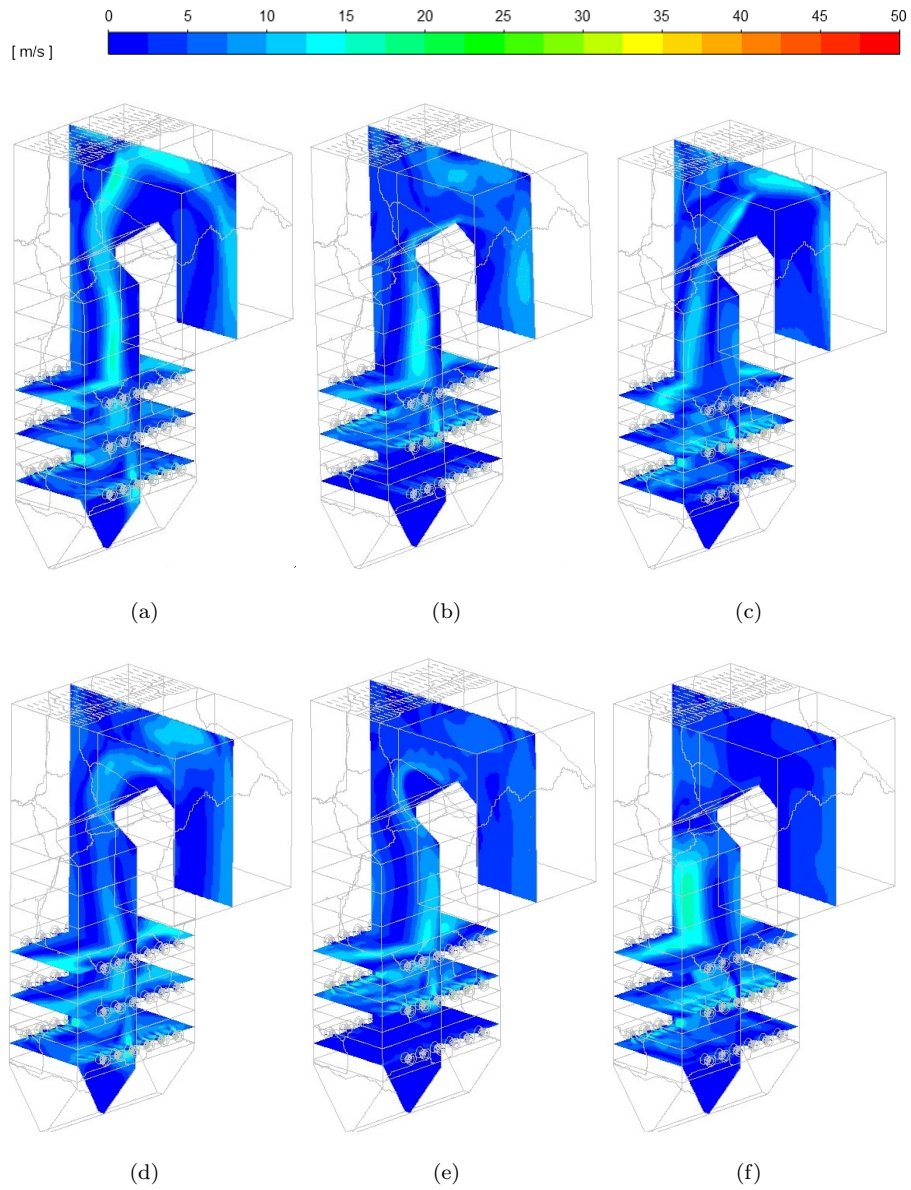


Figure 4: bye

based on standard styles like Harvard and Vancouver. Please use Bib \TeX to generate your bibliography and include DOIs whenever available.

45 Here are two sample references: [? ?].

References

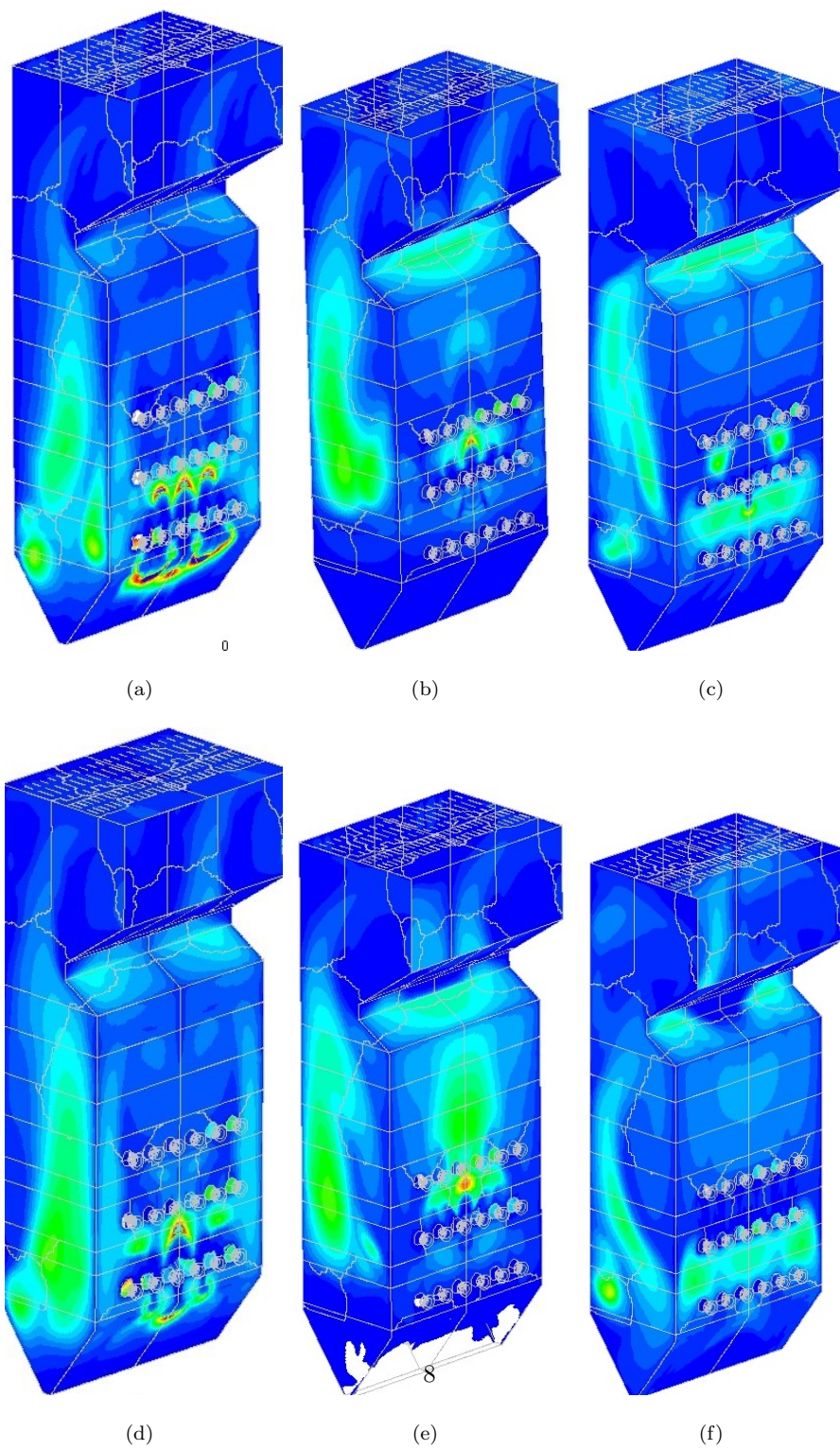
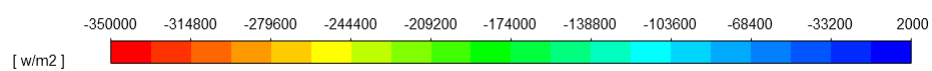


Figure 5: bye