



## Master Thesis Review

<b>Name</b>	Michal Jadrný
<b>Task</b>	Modeling and Simulation of Power Plant Components
<b>Form and technical Content of the master thesis</b>	<p>From April 1. until July 31. Mr. Jadrný preferred his master thesis with the topic "Modeling and Simulation of Power Plant Component" on the Institute of process technology, process automation and measurement technology (IPM). In this time he successfully developed a simulation model for the test facility THERESA which is actually under construction in the new "Zittau Power Plant Laboratory" and also exceeded the existing power plant model of Lippendorf unit R by the implementation of possible thermal energy storage.</p> <p>Within this work Mr. Jadrný had to get knowledge about thermal processes like heat transfer, phase change and storage as well as learn to deal with the simulation tool EBSILON for the modeling of power plant processes.</p>

The first and the second chapter of his thesis describe the basic knowledge about thermal power plants and thermal energy storage.

In the third chapter he described the mathematical and thermodynamic models for the calculation of thermal power processes and the test facility THERESA.

In the fourth chapter, Mr. Jadrný deals with the development of the THERESA Model in EBSILON. This part includes the selection and dimensioning of necessary components for the model as well as the realization and simulation of the different operation model of the facility. Mr. Jadrný developed different models for the most necessary operation modes of the test facility THERESA. This includes e.g. modes like loading and unloading of the displacement storage by using preheated or saturated water from low and high pressure preheater or mixing preheater which is driven by saturated and superheated steam. To finalize this part Mr. Jadrný further developed these models to a common model to simulate all operation modes.

Institut für Prozeßtechnik, Prozeßautomatisierung und Meßtechnik (IPM)

Ansprechpartner/-in:  
C.Schneider  
Fachgebiet Meßtechnik/  
Prozessautomatisierung

Telefon: +49 3583 - 611547  
Telefax: +49 3583 - 611288  
c.schneider@hszg.de

Aktenzeichen:  
Sc

18.08.2014

Hausanschrift:  
Hochschule Zittau/Görlitz  
IPM  
Theodor-Körner-Allee 16  
02763 Zittau

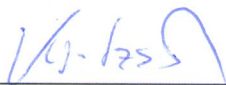
[www.ipm.hszg.de](http://www.ipm.hszg.de)

In chapter five Mr. Jadrný had to get familiar with a power plant model of the Lippendorf unit R and understand all processes which takes place in the water steam circuit. He also implemented the thermal energy storage into the existing power plant model of Lippendorf Unit R.

Finally he simulated the impact to process parameters which occurred by the implementation of the thermal energy storage into the power plant as well as the impact of loading and unloading of the thermal energy storage. Thereby he simulated the impact of the TES for 100 and 80 % load and calculated the theoretical changes in efficiency and performance or different loading and unloading modes. This model successfully achieved a theoretical load reduction of nearly 10 % by loading and a power increase of about 11 % by unloading the storage.

The master thesis of Mr. Jadrný has a logical structure and meets the requirements for the form of a scientific paper. Mr. Jadrný has been working absolutely independently. In assumption his Master thesis performs a contribution to further development of a storage concept which is possible to be implemented into existing thermal power plants. This includes one step to flexible base load power plants which can deal with high load transients in the grid.

*Rating proposal for thesis* 1,3 (very good)



---

Prof. Dr.-Ing. A. Kratzsch

University of Applied Sciences Zittau/Goerlitz  
Institut of Process Technology, Process Automation and Measuring Technology (IPM)  
Departement Measurement Technology / Process Automation