A SYSTEMATIC ANALYSIS AND CONTROLLERS COMPARISON OF THE ALSTOM GASIFIER BENCHMARK PROBLEM

CHIN, C.S. & MUNRO, N.

Abstract: *The purpose of this paper is to provide an efficient and systematic way to realize the ALSTOM benchmark challenge on gasifier control. So far, several papers[3-6] have been published on the control of this gasifier system. However, the ill-conditioned nature of the linear models of this gasifier system is still unsolved. Furthermore, a comparison of the various controllers previously designed by other authors was mainly based on the given performance specifications, no other criteria were used. Initially, a brief description on the gasifier system is given. This is followed by various tests to determine the inherent properties of this gasifier system. The poor numerical conditioning of the gasifier system is also examined. Methods such as Osborne's pre-conditioning are applied to the state-space model matrices to improve the numerical conditioning. Control system design using LQG/LTR is performed on the gasifier system. Lastly, sets of criteria used to compare the various types of controller designed[2] for the gasifier system are also discussed.*

Key words: *control system design, design scaling, numerical conditioning, RGA, gasifier system*

Authors´ data: Mr. **Chin** C.[heng] S.[iong]*, Prof. Dr. **Munro** N.[eil]**, *Nanyang Technological University Singapore, **University of Manchester Institute of Science and Technology, chin0014@ntu.edu.sg, neil.munro@csc.umist.ac.uk

This Publication has to be referred as: Chin, C.S. & Munro, N. (2006). A Systematic Analysis and Controllers Comparison of the Alstom Gasifier Benchmark Problem, Chapter 14 in DAAAM International Scientific Book 2006, B. Katalinic (Ed.), Published by DAAAM International, ISBN 3-901509-47-X, ISSN 1726-9687, Vienna, Austria
DOI: 10.2507/daaam.scibook.2006.14