

BIOMASS BASED INTEGRATED POWER SYSTEM

Srinivas T¹, Reddy B V² and Gupta A V S S K S³

¹Energy Division, School of Mechanical and Building Sciences, VIT University, Vellore – 632 014, India Email: srinivastpalli@yahoo.co.in

²Faculty of Engineering and Applied Sciences, University of Ontario Institute of Technology, Oshawa, Canada

³Department of Mechanical Engineering, J N T U College of Engineering, Kukatpally, Hyderabad 500 080, India

ABSTRACT

The performance characteristics of biomass based integrated gasification combined cycle (IGCC) plant has been developed at the gasifier air supply, steam injection and gasification pressure. A thermo-chemical model, developed by the authors (Srinivas *et al.*, 2009) has been applied to predict the gas composition and performance of an integrated power system. The influence of the relative air fuel ratio (RAFR), steam fuel ratio (SFR) and gasifier pressure has been examined on the integrated energy efficiency, power and stack temperature of the plant. The results show that steam injection into biomass gasifier increases the power output but with a penalty in efficiency.

KEY WORDS: Biomass, combined cycle, dissociation, equilibrium, power generation, thermodynamic