EXPERIMENTAL INVESTIGATION OF PEAT HYDROGASIFICATION. W.S. Hines, L.P. Combs, and F.D. Raniere. Rockwell International, 8900 DeSoto Avenue, Canoga Park, California 91304.

This paper describes a series of experiments sponsored by the Department of Energy in which dried, pulverized Minnesota peat was hydrogasified in an engineering-scale (3/4 TPH) hydrogasifier system designed for pulverized coal feed. Pulverized carbonaceous solids are fed in dense phase (i.e., minimum transport gas) to the Rockwell 3/4 TPH entrained-flow hydrogasifier where they are very rapidly and thoroughly mixed with a high temperature hydrogen stream. The hot hydrogen heats and pyrolyzes the individual solid particles. Reactor operating pressure and temperature, together with reactant feed rates and residence time, are varied to achieve a desired performance, viz., overall carbon conversion and relative distribution of converted carbon among gaseous and liquid products.

Very interesting and promising hydrogasifier performance has been experienced with peat. Overall carbon conversion levels, substantially higher than previously observed with coals under comparable conditions, ranging to as high as 84.2%, were previously reported. This paper is an update of the continuing peat hydrogasification test program being conducted by Rockwell International. Overall conversion is measured with respect to reactor temperature, residence time, and pressure. Reactor conditions will be optimized to permit the most economical conversion of peat to substitute natural gas.

Detailed results of the peat hydrogasification experiments are presented and discussed. Included are comparisons with other investigators' findings.