

Dynamics of the Wet-end Section in Paper Mill

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A model representing the wet-end section of a paper mill has been developed to characterize its dynamic behavior during the grade change. The model is based on the mass balance relationships written for the simplified wet-end white water network. From the linearization of the dynamic model, higher-order Laplace transfer functions were obtained followed by the reduction procedure to give simple lower-order models in the form of 1st-order or 2nd-order plus dead times. The dynamic response of the wet-end is influenced both by the white water volume and by the level of wire retention. Effects of key manipulated variables such as the thick stock flow rate, the ash flow rate and the retention aid flow rate on the major controlled variables were analyzed by numerical simulations. The simple dynamic model developed in the present study can be effectively used in the operation and control.