Weyerhaeuser Flint River Operations

Brownside Optimization & ITC™ IsoThermal Cooking Project

The ITC™ (Iso Thermal Cooking) process was developed and patented by Kvaerner Pulping to permit cooking softwood to very low Kappa numbers with good retained strength of the pulp fibers. The ITC™ process features cooking of wood chips in a concurrent zone followed by a countercurrent zone and continues at full cooking temperature into the digester's washing zone without any major decrease in washing efficiency. White liquor is added to the bottom part of the digester, and to obtain an even temperature and alkali profile over the digester cross-section, the circulation flow is increased. The required increase in circulation flow is possible by installing wall screens. The substantially longer cooking time compared to conventional cooking processes allows for a low overall cooking temperature. Compared to Extended and Modified Continuous Cooking processes, cooking under these conditions improves selectivity where lignin reactions are concerned.

For Flint River's digester, several modifications were made in two steps. The first step was installing a new set of wall screens and replacing the existing trim screens with a new set of box screens. The second step was cutting off the old top of the digester and replacing it with a new top 60 feet taller. The new top included a new set of trim screens, new strain gauge mechanical chip level indicators, new central pipe, and a new inverted top separator. New extraction screens were installed and the digester's original washing screens were replaced with box screens. A number of heaters and liquor pumps were also installed.

Other modifications to the brownside of the fiber line included replacement of the primary screens, new baskets for the primary knotters, and a new secondary knotter to handle the new pulp characteristics. The impregnation vessel and digester outlet devises were changed from constant speed drive units to variable speed AC units. An injection system was installed to send "knots" back to the Chip Bin for reprocessing in the digester. The condensate collection system was modified by the addition of three new heat exchangers, reuse of two existing heat exchangers, and a condensate return system for all of the new heat exchangers. About 25% more capacity was also added to the fiber line's motor control center and the fiber line's total distributive control system was modernized.

Results measured after these modifications met the project objectives of better economic performance, improved product quality, and reduced environmental impact.

The attached article from *Pulp & Paper* magazine (June 1998), "Weyerhaeuser Modernizes Flint River with Continuous Digester Overhaul," provides a broader description of Weyerhaeuser's Isothermal cooking project.