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*Using Campaigns to Control and Plan Sawmill Production*

Sawmills are capacity limited process industries with divergent production processes in which a single log is turned into a large number of output products. The concept of campaigns facilitates various approaches to control of sawmill production. We look at two of these in reasonably complex settings with more than 70 final products and more than 100 potential campaigns. The first approach generalizes the concept of economic lot sizing. In the classical setting, the economic lot size takes into account holding costs and setup times to find a production strategy that minimizes inventory will respecting capacity constraints. We use a powers of two approach implemented as an MIP, but instead of focussing on product lot sizes, we focus on campaign lot sizes. For constant deterministic demand, this gives the minimum possible inventory levels achievable given the demand and capacity. We use a simulation environment to understand how these campaign lot sizes can be used in a stochastic environment. The other approach is a rolling planing approach where the production decisions each period are in terms of campaigns and markets for products are multiple tier with the possibility of disposal at low prices for excess production. An MIP approach makes it possible to account for production and setup times for the campaigns. Depending on what aspects of setup cost we wish to address, various formulations are possible. The MIP's aren't easy to solve but solutions within 6