

ISyE 4803
Advanced Supply Chain Logistics
Fall 2006

Reading Assignment 6

Due Date: October 26, 2006

Read the materials below in preparation for discussion in class. The questions are intended to guide your reading and thoughts, but are not the only aspects that will be discussed in class.

1. Gerald G. Brown, Joseph Keegan, Brian Vigus, and Kevin Wood, “The Kellogg Company Optimizes Production, Inventory, and Distribution”, *Interfaces*, vol. 31, nr. 6, pp. 1–15, 2001.
 - (a) Describe Kellogg’s North American production and distribution network.
 - (b) Describe the input data for the Kellogg Production System (KPS).
 - (c) What are the shortcomings of using continuous variables in the model?
 - (d) Why are continuous variables used in the model?
 - (e) Why would a multistage stochastic programming model be more accurate?
 - (f) What is meant with a rolling horizon implementation?
 - (g) What is meant with solution persistence?
 - (h) What is the difference between the different models in KPS?
 - (i) Why is shelf life an issue in the tactical model?
 - (j) How can decision variables be created and constraints be used to explicitly incorporate the shelf life issue into the model? Define specific decision variables and write appropriate constraints.
 - (k) What is the problem with explicitly incorporating the shelf life issue into the model?
 - (l) How does the tactical model deal with the shelf life issue?
 - (m) How has KPS saved Kellogg money?
 - (n) Explain the linear programming formulation of KPS.
 - (o) Explain exactly how constraints such as $\sum_{j=1}^n a_{ij}x_j \geq b_i$, $i = 1, \dots, m$, can be made “elastic”, that is, how can they be penalized with linear penalties only if the constraints are violated.