Homework 09: Problem Definition

Due Date: Friday, Apr. 20, 2018, 23:59

Optional Pair Work

60 Points

For this homework assignment, if you need more information on problem definition techniques you can refer to the course slides and the "strategies for creative problem solving" book.

Problem 1: Carry out a present state/desired state analysis and prepare a Dunker diagram for the following problem:

"I want a summer internship but no one is hiring."

Problem 2: Sparkling mineral water is the primary product of Bubbles, Inc. This firm, which is based in France, serves three major markets – Europe, North America, and Australia. It collects water from a natural spring; the water is then filtered through a parallel array of three filter units, each containing two charcoal contaminants. The filtered water is stored in separate tank farms, one for each market, until it is transported by tanker to one of the three bottling plants that serve the company's markets. When the water arrives at the bottling plant, it is temporarily placed in 3500 m^3storage of the producer. Some of the water is also flavored with lemon, cherry, and raspberry additives.

Next, the sparkling water is packaged in a variety of bottle sizes and materials, ranging from 10-ounce glass bottles to 1-liter plastic bottles. The European market receives its shipments truck, usually within three days. Products bound for North America or Australia are shipped first by truck to the waterfront and then by freighters to their overseas destinations.

Business has been good for the last several months, with the North American and European markets demanding as much sparkling water as can be produced. This situation has required that Bubbles contract with additional plastic bottle suppliers to keep up with the increased demand. It has forced regularly scheduled maintenance for Australian and North American tank farms to be delayed and rescheduled because of the high demand for the product. There is also, of course, a larger demand placed on the spring that supplies the mineral water for the process.

Unfortunately, the news is not al good for Bubbles. The bottling plant for the Australian market is currently several weeks behind schedule owing to a shipment that was lost at sea. This catastrophe has required that water from the company's reserve springs, which are located many miles from the bottling plant, be used to augment the water supplied by the regular spring so that the bottling plant can operate at an even higher level of production. The availability of water

from the reserve spring is hindered by their remote locations, but the water from these springs does not require filtration. In addition, contract negotiations are going badly and it appears there will be a strike at all of bottling plants. Recent weather forecasts indicate that relief from the ongoing drought, which has already lasted three months, is not likely. Worst of all, customers in North American and Australian markets are complaining that all shipments of the sparkling water in the last six weeks have contained benzene in unacceptably high concentrations. You know that benzene is often used as an industrial solvent but is also found naturally.

A quick survey of the bottling plant managers shows that the North American-bound products that are currently packaged and awaiting shipment have benzene concentration in excess of acceptable concentrations. However, the managers of the bottling plants that service the Australian and European markets report that no significant level of benzene was detected in the bottles that are currently stored. Authorities in the North American and Australian markets have already begun recalling the product, with authorities in the European market pressuring Bubbles for a quick solution and threatening to recall products as a precautionary measure.

Carry out a K.T problem analysis to learn the cause of the problem.

Your submission for this homework assignment must be made to Canvas.

This homework may optionally be done with a partner.

Legibility counts.

All assignments must include the following pledge:

> *"I have not received unauthorized aid on this assignment. I understand the answers that I have submitted. The answers submitted have not been directly copied from another source, but instead are written in my own words."*