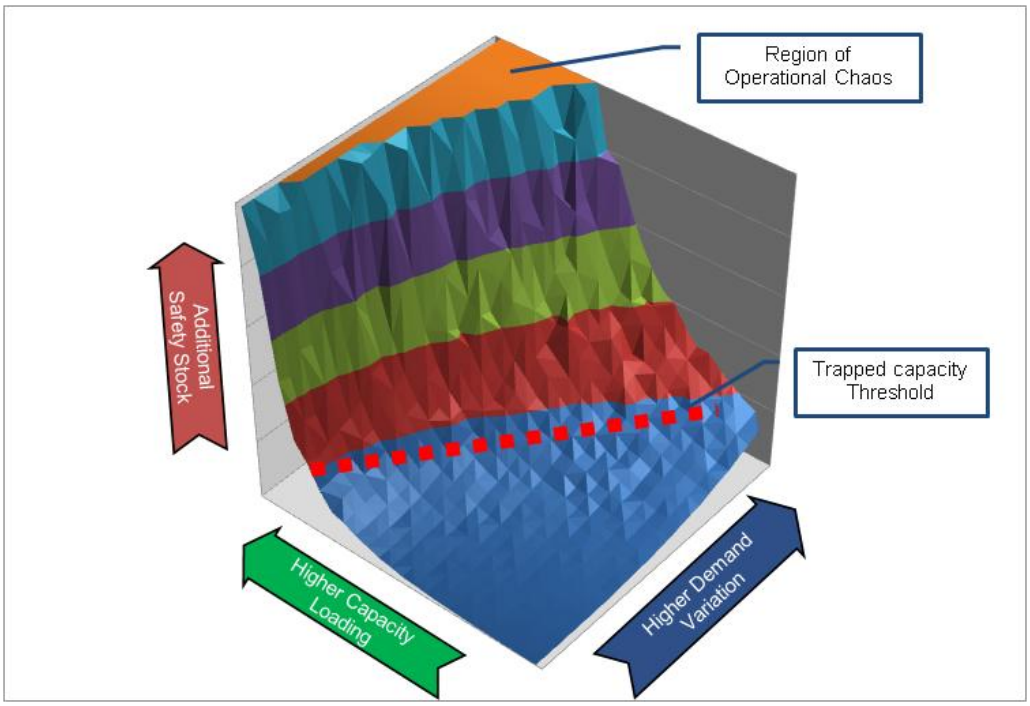
2010 APICS INTERNATIONAL CONFERENCE AND EXPO

The impact of Trapped Capacity on production planning

Steve Johanson
CEO, Supply Chain Toolworks
San Diego, CA

"Trapped Capacity" is the phenomenon where demand variability consumes effective capacity of a tool or work center. Most people are intuitively aware of it but do not factor it into their planning and line loading. Trapped Capacity, when unmeasured, manifests itself in the form of floating shortages. The impact is that after a plan is set, a facility finds itself running extra shifts, breaking run strategies, or shorting product.

For example: a work center might be able to make a certain amount, say 1MM cases per year. And by the end of the year, it will have made 1MM cases but it will not be the right product at the right time. During the year, surges and troughs in demand force plants to react to mix changes as well as capacity shortages. Safety stock can cover some of this variability but there is a certain threshold at which a work center is loaded above a point at which it can react. In the example, the tool can make 1MM cases per year but should only be scheduled to 900K per year. That 100K per year is "Trapped Capacity."



Most organizations are not aware of this threshold and inadvertently schedule above that loading. After all, if a tool is supposed to make 1MM cases per year,

shouldn't it be scheduled to 1MM cases per year? The answer is no. The result of scheduling above the trapped capacity threshold is product shortages, broken run strategies, and cost over runs.

The blame often falls on forecasting and not scheduling. However, the speaker will extend the "Perfect Forecast" hypothesis and show that even in the presence of 0% Forecast Error, planners need to balance variability between safety stocks and spare capacity—one or the other will not be sufficient or cost effective.

A planning organization can manage trapped capacity by

- Developing statistical model of their business
- Building flex capacity into staffing and capital planning
- Making plans that acknowledge the presence of "Trapped Capacity"
- Engaging in demand shaping projects
- Executing these plans

These techniques have been proven by the speaker in a number of manufacturing facilities. Examples and indexed data will be drawn from several actual cases in the Food Manufacturing industries including microwave popcorn production.