

*It's not magic but logic that's giving an Indiana engine distributor record returns on assets invested in parts inventory.*

By Michael J. Major

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ramatic. The word gets used to the point of exaggeration, but it's the right word to describe the changes made at Cummins Mid-States Power of Indianapolis during the past year.

This engine distributorship was the test case for a new parts inventory management system developed by Cummins Engine Co. in conjunction with a Chicago-based management consulting firm.

The results speak for themselves: During the eight-month trial period, the new approach decreased required inventory investment by 38% while increasing overall parts availability from 81% to 91%. Distributor management reports that they achieved the highest return on assets in their 28-year history.

Not surprisingly, the new program, known as "optimized inventory management" or optimizer for short, is gradually being made available to the 32 other Cummins distributorships throughout the country.

This story is about the optimizer concept and how it's being used successfully at Cummins Mid-States Power. But it's also a study in how a manufacturer can work in partnership with its dealers and outside suppliers for the ultimate benefit of the customer.

## PROBLEMS AND SOLUTIONS

Mid-States began searching for a solution to an inventory problem in early 1994. The problem was simple—inven-

## 'THE OPTIMIZER' CREATES NEW HIGHS AND LOWS



A new inventory management system has enabled Cummins Mid-States Power of Indianapolis to achieve every dealer's goal of reducing stock levels while increasing availability for customers.

tory, and too much of it. Dewey Spence, who manages the company's inventory and computer systems, recalls: "We recognized that we were overstocked in our Indianapolis branch, which also acted as a warehouse for our two other territorial branches."



*"Inventory cost reductions of 30-40% are common. Availability increases of tens of percentage points are routine."*

**Terry Harris**  
Chicago Consulting

We did this to take advantage of a Cummins program that provided special discounts to distributors who did their own warehousing. But our inventories were too much for the marketplace.

"The statistics we had for inventory turns showed we were way overstocked,

and we had the gut feeling that we were carrying a lot of obsolete inventory."

Meanwhile, back at the Cummins factory in Columbus, Ind., the search was on for ways to help distributors overcome these types of problems. Pam Tully, materials director for Cummins, explains, "We've come to realize that our success is tied to our distributors' success. Whatever efforts we make to help them ultimately helps us and our customers."

Cummins was working with Chicago Consulting managing partner Terry Harris on a new open architecture computer system that would link distributorships with the factory and other suppliers. The company asked Harris to conduct a test of optimized inventory management at Mid-States. The system had been used successfully in other fields, but was new to this industry.

Prior to trying this new approach, Mid-States relied on several traditional and widely used methods of inventory management, according to Spence. The first was a manual procedure in which parts were ordered according to set parameters such as order point, quantity and lead time. The company also used a

computer-based statistical forecasting method that relied on order history analysis, classification of parts according to how frequently they were ordered and safety stock allowances.

While these methods had worked in the past, they were coming up short today for several reasons. One factor is the increasing financial pressure, as dealerships seek to get a higher return on assets invested. A bloated parts inventory works against that objective.

Another factor is the quicker introduction of new parts and obsolescence of old ones, which increases the likelihood of a distributor having outdated stock in inventory.

Finally, there is the human factor. "Many people just don't have the skills to properly use the old systems," according to Spence. "It is a difficult task to monitor the system demands and keep up with all of the changes needed to make them work properly."

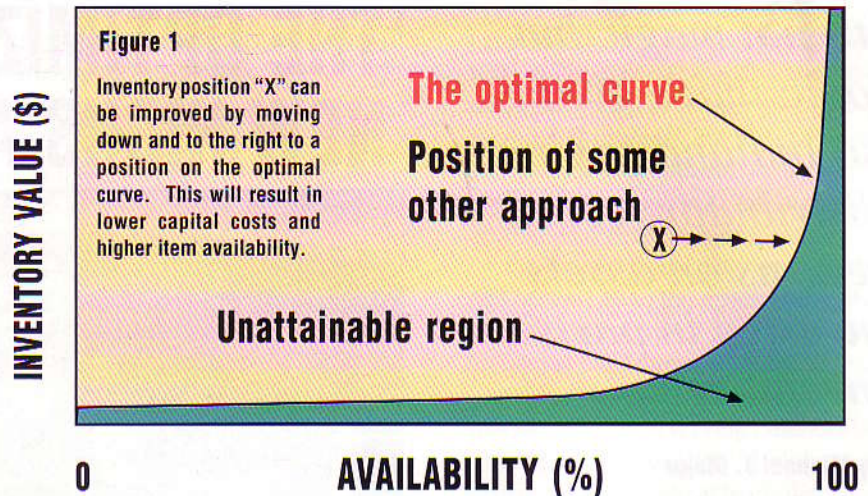
Enter Chicago Consulting and the optimizer system. "Our new approach is both complex and simple," explains Terry Harris. "It's complex in that it uses sophisticated mathematics. This, however, is invisible to the user. It's simple in the sense that with it the user can specify an availability level. The system will then create an inventory that achieves that availability at the lowest possible inventory investment."

## THE OPTIMIZED APPROACH

How does optimized inventory management work and what does it optimize? It optimizes availability per dollar—availability of the whole inventory per dollar of inventory investment. This makes it very different from other approaches.

With it an inventory planner can specify any availability level and be guaranteed that the inventory investment is the lowest possible. Alternatively, the planner can specify any inventory investment level and be guaranteed that the optimized approach will result in the highest availability possible.

"Most other approaches allow the user to specify an availability level. However, they require higher investment than this approach," says Harris. "Only a few other approaches allow the



user to specify an inventory investment. Those that do, however, result in lower availability."

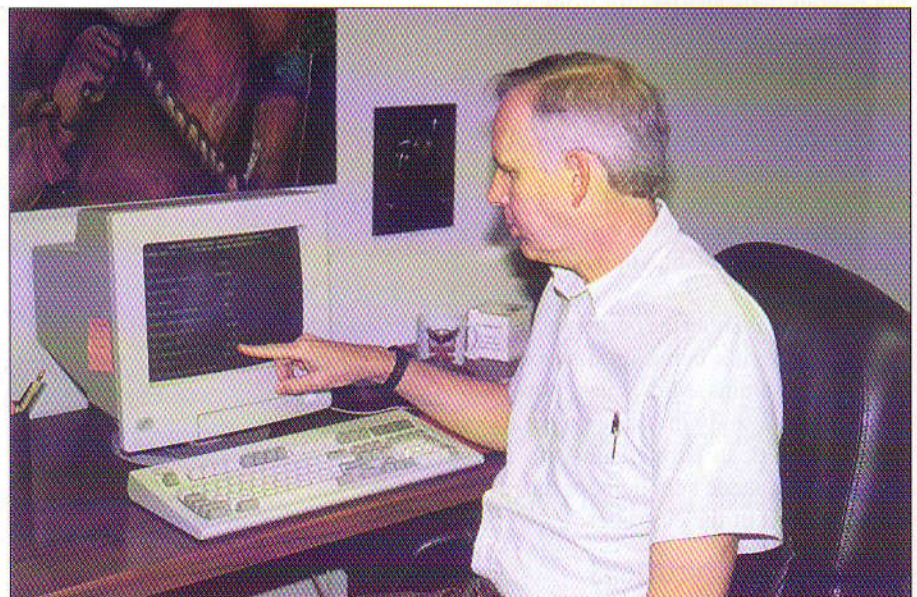
Availability is calculated by treating demand for an item as a random variable. It's represented by a probability distribution. The availability of an item is calculated using the probability distribution of that item. Then the availability of the whole inventory is calculated by weighting the availability of each item by its forecast demand.

The optimized approach creates an optimal curve (see Figure 1). The curve defines optimal inventory positions along the availability and cost spectrums—

inventory positions that specify the level of each item. The curve creates an unattainable region below it—one that cannot be reached by any approach. All other approaches are above the optimal curve.

Improvements are made when an inventory planner moves to a point on the optimal curve to increase availability and reduce cost at the same time. Any point on the optimal curve to the lower right is better. It provides lower cost and higher availability.

The optimal curve is developed by constructing optimal inventory positions item by item. It then recommends



Dewey Spence, who manages Cummins Mid-States Power's inventory and computer systems, demonstrates the optimizer approach. The system "optimizes" availability per dollar—availability of the whole inventory per dollar of inventory investment.