



## ***Steel Works, Inc.***

*This case was prepared by research assistant David Kletter under the direction of Professor Stephen C. Graves as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.*

Gary Lemming sat in his new corner office and tapped his pencil on the desk. Lemming had just been named head of Steel Works, Inc.'s new centralized logistics group. After a decade of experience implementing MRP (Materials Requirements Planning) systems throughout the company's manufacturing facilities, Lemming was confident he could handle the job. Until this morning.

"Our inventory levels are ridiculous!" barked Jean Du Blanc, the company's Chief Financial Officer. "Our customer service is the worst in the industry, and getting worse," grumbled Kirk Callow, the CEO. Lemming started to explain, "You see, I've already set up a team to look at all of that. . ." But before he could finish, Callow stood up. "Sales are down 30% and expenses are up 25%. Our best customers are calling me and telling me they're going to our competitors, and at the rate we're losing market share we won't be in business in a year. I don't want to hear about teams, I want you back in here in a week telling me how you're going to fix this thing."

Lemming looked over the list of people he'd asked to meet with him this week. He shook his head— how do I lower expenses and improve performance? How will I ever find the right answer?

## **Background**

Steel Works, Inc. is a manufacturer of custom and specialty use steels with annual sales of \$400 million in 1993. Founded in 1980 by three brilliant material scientists from MIT, the company now employs more than 2500 people at 5 different locations. With its first product, DuraBend™, the company earned a reputation as a high technology provider and quickly established a niche position in what is typically regarded as a commodity market. Its two divisions, Specialty Products and Custom Products, are very separate and distinct businesses.

## **Custom Products**

Lemming's first interview of the morning was with Stephanie Williams, President of the Custom division. "Our motto is 'The Customer Comes First, Second, and Third, But Never Last'" explained Ms. Williams. "The Custom division develops most of its products under contract for a single customer, for sale exclusively to that customer, and works very closely with them from before a product is invented until our product is a part of their product. We have the best scientists and engineers in the world, and that is why the biggest companies in the U.S. come to us. We've designed the metals that make our customers' products work great. That's why we typically aren't allowed to sell our products to anyone but the original customer - our customers' competitors would love to buy from us."

Williams went on to explain that eventually when a product is no longer leading-edge, the Custom division will negotiate with the customer to allow Steel Works to sell the product to anyone. "Such discussions are an art form," explains Stephanie, "but it can make a huge difference in sales revenues for us."

"Take DuraFlex™ R23, for example. We developed that under contract for one of the big three auto companies. It took us over a year to develop, and there is still no product like it in the marketplace. Yet we were able to convince our customer to allow us to sell it openly on the market at a 30% premium over what we charge them. We still sell in large volumes to our customer, and Specialty Products makes a small fortune manufacturing the exact same steel and selling it at a higher price to four other auto manufacturers and a copier company."

Williams displayed a schematic of Custom Products' manufacturing system. The three manufacturing sites were each located within a few miles of one of Custom Products' three R&D centers, which served the West, Midwest, and Eastern regions of the U.S. Customers and their products were each assigned to a specific plant and R&D center. Steel Works operated several warehouses located near the plants.

The only question on Lemming's mind was why the inventory levels were so high. The reply was direct and blunt: "We've got to keep our customers happy. Customers aren't satisfied when you tell them that they have to wait three weeks for delivery! We listened to that corporate inventory reduction mandate in 1991 and cut our inventories back 20% and we were running out of product every week!"

## **Specialty Products**

"Let me tell you something," Barry White said as he stormed into the room, "we are *nothing* like Custom." Mr. White was President of the Specialty division, whose sales have been the most hard hit in recent months.

"That Custom division has nothing to do all day but play in laboratories. We're the ones out in the marketplace selling every day and bringing in 67% of this company's revenue. I've got the best sales force around, and they are what makes this business work."

"Custom thinks they're so special because they've got some big customers, well guess what, so do we. Our largest customer in Specialty brings in 10% of the revenue for this company, and it is with blood, sweat and tears that we keep them and everyone else as our customer. You want to solve some problems? Manufacturing is where the problems are, you should talk to them. I've got my plant managers screaming at me every day that the CSR's [customer service representatives] are screaming at them because the customers is screaming at the CSR's for not having any steel in the warehouse to ship. And that's not the CSR's fault, it's manufacturing's fault."

"Last week the IS department comes knocking on my door telling me how great it would be if all of Steel Works was on a common computer system, and wants me to pay \$12mm for my division. They think they understand our business

## **Steel Works, Inc.**

but they don't. We don't need centralized computer systems, we need to fix manufacturing!"

White explained that like the Custom Products division, Specialty attempted to manufacture its products in a single plant. The division operated three plants that manufactured 6 different product lines. The division's general strategy was to exploit economies of scale in production and to rely on the logistics network to distribute the product nationwide. To achieve further efficiency, product families were almost always manufactured in the same plant to save manufacturing costs: the change-over costs between products in the same family was often considerably lower than across different families. Products were produced in a rotating sequence. For example, DuraFlex™ R23 is always produced during the first week of the month.

And before Lemming knew it, White had stormed out of the room.

### **Analysis**

It was now Tuesday and 20% of the week was gone. Debby Klein, a senior logistics analyst, sat across from Lemming.

"Well it's just like you said it would be. Custom has a lot of products, and something like 90% of them are sold to only one customer. On the other hand, Specialty has something like 130 customers for some 120 products. They've got so many products I can't even keep track!"

Debby then related the grim news about customer service levels. "Based on data collected by our order entry systems, approximately 70% of the orders entered into the system are scheduled to be shipped from stock within 48 hours. The rest of the orders (30%) are either canceled by the customer at the time of entry or placed in a backorder file. I couldn't find out how many of the backorders are canceled, and I wasn't sure if we needed to know that."

Lemming then asked about the big customer. "Yep, they're big all right. They're like 15% of the Specialty sales for 1993 but they buy a lot of different products. There are other big customers, though. And small ones, and medium-sized ones too" (see Exhibit 1). "Thanks Debby," said Lemming, feeling more confused than ever.

After lunch, Lemming had the production plan for Specialty's Ohio plant faxed to him. The Ohio plant manufactured the DuraBend™ and DuraFlex™ product families. Production at the plant followed a regular rotating schedule, producing each family about once per month. The plan seemed consistent with Barry White's account of the division's manufacturing strategy.

At the end of the day, a young forecasting expert named Maria stopped by, looking quite upset. "I looked at all the products like you asked. It's a mess just like you said. 80% of the products fall in this 'highly volatile' category (see Exhibit 2). With standard deviations that large, I don't think a demand forecasting tool is going to help you very much."

### **Consulting**

Bright and early on Wednesday morning, Fred Chow, a logistics consultant, walks into Lemming's office. "From what you described on the phone, the answers are all very simple. There are three things you need to do:

1. Get rid of all those products. You've probably got products that have annual sales of a few thousand dollars, and probably have products that aren't selling at all. Discontinue them and focus on your high margin, high volume products to maximize your revenue.
2. Use a statistical forecasting package to predict your demand and this will lower the amount of inventory you need. You see, the inventory levels you need to hold will be a function of the least squares regression and the resulting standard deviation of error in demand in the leadtime. So reduce that and you've reduced your inventory. *Violá!*
3. You've probably got too many warehouses. Everybody knows that fewer warehouses mean less inventory."

Lemming was now excited. Although he didn't understand about the least squares-thing, and although Maria said yesterday that forecasting wouldn't work, now he was getting somewhere. Accidentally calling the consultant "Jonah" at one point, Lemming was forever grateful.

### **Reality Sets In**

The businesses completely rejected the idea of discontinuing the slow-moving products. “We can’t do that! Our most important customers buy those products!” So much for that idea.

If that weren’t bad enough, Debby happens to stop back in. “Reduce our warehouses? What are you talking about? If we have to ship from fewer warehouses, it will take longer, cost more and that will really make the divisions mad. Plus, just because you combine two warehouses doesn’t mean you’re going to save that much money. Some fixed costs certainly, but that won’t make up for that added transportation costs you’re going to have to swallow.”

Lemming didn't believe this, so he mounted an effort to get to the bottom of the warehouse consolidation issue. Several hours and several hundred sheets of paper later, Lemming realized that he had underestimated the data collection and number-crunching involved with this type of analysis. Although the idea had the potential to reduce costs, his team did not have enough time to look at it this week.

### **The Clock Chimes Eleven**

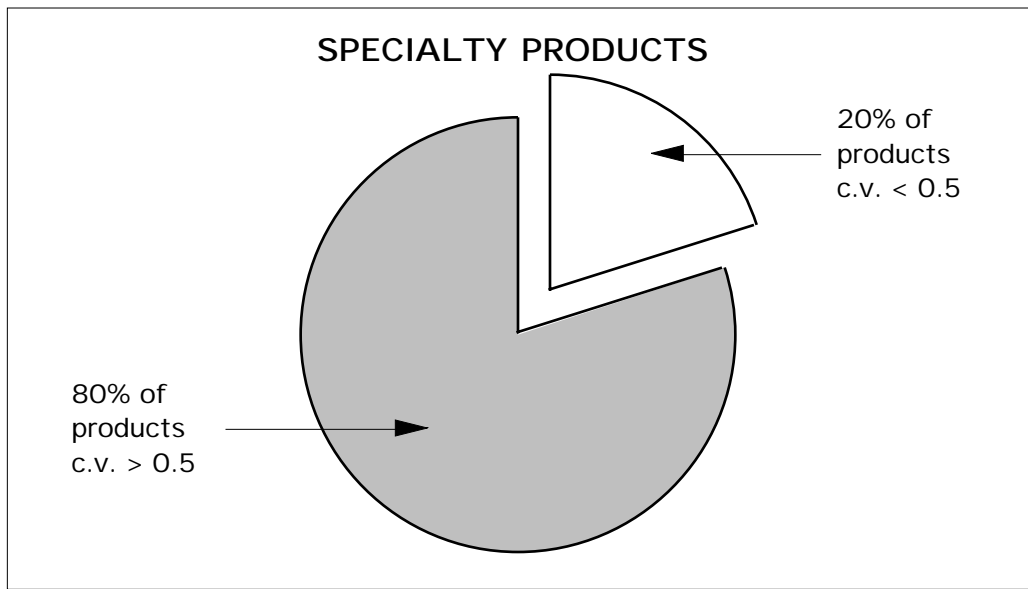
It’s Thursday, close to midnight, and Lemming is now sweating. Debby, Maria and John Thompson, a recent Sloan graduate, are all gathered in the corner office. They’ve listed a dozen ideas on the blackboard: ABC analysis, customer segmentations, EOQs, and many more... and crossed them all off. Lemming can see Callow’s angry face now – his career is slipping away.

Now what do you do, John Thompson?

– \* –

BIG CUSTOMERS (> \$25mm)	5
SMALL CUSTOMERS (< \$1mm)	107
ALL OTHERS	18
TOTAL	<u>130</u>

**Exhibit 1** Profile of Specialty Products customers



**Exhibit 2** Demand variation in Specialty Products \*

\* Note: c.v. means coefficient of variation of one month's demand, equal to the standard deviation of demand over one month, divided by the mean monthly demand.

## OVERVIEW OF STEEL WORKS, INC. DATA

Since it would be nearly impossible to analyze all of Steel Works' data, a representative sample of products from 1994 has been provided to you. Specific data has been provided for portions of two of the product lines: DuraBend™ and DuraFlex™.

Five spreadsheets are available to assist you in your analysis:

S0121958.XLS      Sales of DuraBend™ R12 for each month and for each customer.

MONTHVOL.XLS    Total sales of DuraBend™ and DuraFlex™ for each month.

PRODBAT.XLS      Production batch sizes for DuraBend™ and DuraFlex™.

FINCLDAT.XLS     Unit costs and 1994 selling prices for DuraBend™ and DuraFlex™.

EOMINV.XLS       DuraBend™ and DuraFlex™ inventories at the end of each month.

Note: In the spreadsheets provided, all data (including dollar figures) are in thousands.

*When drawing inferences from the data, you can safely assume that the DuraBend™ and DuraFlex™ product lines are representative of the entire Specialty division.*

## QUESTIONS TO CONSIDER

Although your recommendations and analysis can take any form that you wish, the questions below may assist you in your thinking.

1. Based on the spreadsheet data, how would you characterize Steel Works' products? What about Steel Works' customers? Given your answer and the information in the case, what does this suggest?
2. What does the coefficient of variation tell us? Can you determine the coefficient of variation for the DuraBend™ and DuraFlex™ product lines?
3. How much inventory has Steel Works been holding? How much should they have been holding?
4. Although no data is given for the Custom Products division, are there any obvious opportunities that are suggested by the information in the case?