Case 18

RICH-SEAPAK CORPORATION

The origins of Rich-SeaPak Corporation went back to 1948, when three enterprising Georgians set up a shrimp processing and freezing operation at a decommissioned naval base on St. Simons Island. They called their first product PDQ Shrimp because it was peeled, deveined, and quick-frozen. The proximity of shrimp fisheries and an airport and the availability of surplus navy freezer space made the business possible. Some 43 years later, the company had grown, established a plant in Brunswick, and diversified its product line. In 1991, it began to consider whether some form of activity-based costing (ABC) might be helpful. Three years later, ABC was an accepted part of SeaPak's continually evolving management-information system.

Michael Hendley, vice president of Southeastern Operations of Rich-SeaPak Corporation, became interested in a possible application of ABC in April 1991 when he attended an executive- development program. It seemed to him that the proliferation of SeaPak's products, together with the considerable variation in their volumes, presented a scenario in which ABC could be useful. Overhead represented around 20 percent of total costs (direct labor was about half that amount and material costs the balance), so the dollars involved were significant. Hendley discussed ABC with John Babich, the company's controller, and they began a development process that extended over the next several years.

PRODUCTS AND CUSTOMERS

Over the years since PDQ Shrimp had first been offered, other product lines had been added. In the early years, several extruded products were developed: Shrimp 'n Batter, Onion O's, and Hush Puppies. Later the line was expanded to include French Toast Sticks, Cheese Sticks, and Vegetable Sticks, as well as unbreaded fish, breaded vegetables, and a variety of seafood specialties. Variations in breading and packaging increased the number of different items produced at the Brunswick plant to over 100, though many items were sold in relatively low volume.

Shrimp, fish, and vegetables arrived frozen at the Brunswick plant. Bread and cheese were fresh. SeaPak purchased shrimp from all over the world, but primarily white shrimp from China. Despite its distance, China had become a big supplier of shrimp to the United States. Fish, such as the cod fish used in fish sticks, was obtained by a purchasing group

in Gloucester, Massachusetts, and came frozen in blocks from various points on the East Coast. Vegetables came frozen from a number of vegetable-producing areas.

SeaPak sold its output to a variety of customers through several channels. Some was sold unbranded to institutional food-service companies. Fast-food chains were also major customers. Supermarkets and food wholesalers bought SeaPak products packed in display boxes under the SeaPak brand. In almost all cases, customers had more than one source of supply. Over time, the product line evolved as existing items were improved, new items added, and others phased out. Some of the changes were initiated by SeaPak, others were made in response to customer suggestions. Management believed that one of the company's special competencies was the development and perfection of new products and production technologies.

PRODUCTION PROCESS

The Brunswick plant was divided into two major areas, called the "extruded" and "specialty" plants. The extruded plant had three production lines and, as its name suggests, was where most extruded products were made. The name of the specialty plant was a carryover from previous years, when its two production lines were dedicated to making specialty items; nonextruded products were made in the specialty plant. Each of the five lines produced a range of 10 to 20 different products. Two preproduction areas prepared certain items prior to production.

Each production line was assigned 26 to 38 workers, depending on the complexity and throughput of the item being produced that day. The usual sequence on a production line was as follows:

1. Raw materials were brought out from the warehouse and unloaded off pallets by one person.

2. One to two workers loaded raw materials into machinery that formed the product. For example, on the specialty lines, loaves of bread and chunks of cheese were cut into the shape of sticks. Formed pieces fell out onto a conveyor, which was often a wire mesh. At this point, people manually intervened to pick out malformed pieces and spread the good pieces on the conveyor so they would not pile up on each other. Nine people carried out this quality-assurance function. On the extruded lines, fewer than nine people were needed because the products could be arranged more precisely by the machine than on the specialty lines.

3. Pieces on the conveyor were then dipped in batter and breaded in various combinations that matched product requirements. The particular mix of batter and breading was a key part of SeaPak's product quality. Taste, texture, and color were carefully controlled through the composition of the coating material and in the cooking process.

4. On four of the five production lines, most products were precooked by being carried on the conveyor through gas-fired fryers.

5. Flash freezing followed cooking, with only a fraction of a minute required for products to travel from oven to freezer. Like breading and cooking, the freezing process had to be carefully controlled. The bread in toast sticks, for example, could not be frozen in less than about 15 minutes without a change in consistency; other items could be frozen in just a few minutes, and with these items, the conveyor could take a more direct path through the freezer.

6. Most items were put in clear plastic bags and sealed. Those items going to institutional customers (school systems, fast-food chains, food-service firms) were packaged in large boxes, sometimes two or four bags to a box. The smaller bags of items destined for resale in supermarkets were each put in small display boxes with colorful printing on the outside, and the display boxes put in large corrugated boxes.

7. As soon as packaging was complete, the boxes would be stacked on a pallet, which was carted off by a small truck to the freezer. In most cases, materials traveled from the production line freezer to the finished-goods freezer in less than five minutes.

8. SeaPak had two very large freezer warehouses, kept at 0 to minus 10 degrees, capable of storing several months of production.

Some items required special preparation before they could be cut and laid on the production conveyor. When the ABC study started, natural onion rings were made at the Brunswick plant. Onions were peeled, sliced, and separated into rings in a separate, glass-enclosed room. Those parts of the slices that were not usable as rings were conveyed to a machine that minced them. In another preproduction step, the minced onions were combined with other ingredients into a mash that was extruded into onion-sized rings called Onion O's by a machine originally designed to make donuts.

Two other extruded products, Shrimp 'n Batter and Shrimp Poppers, also required a preproduction step. The shrimp were inspected (two or three workers watched the raw shrimp come down the conveyor), minced, and carefully blended with other measured ingredients to provide a mash with just the right consistency. The mash was then extruded in shrimp-like shapes, put on a conveyor, and carried through the usual cooking, freezing, and packaging steps.

SUPPORT ACTIVITIES

A number of support activities were included in overhead.

Sanitation

Federal health regulations require seafood producers to clean and sanitize their entire plant daily, regardless of the items being produced that day. At SeaPak, this cleaning was done during the third shift. This shift was also where SeaPak experienced its highest absence and turnover rate. John Babich had cited a 70 percent attrition rate for the company, which was primarily attributable to the third-shift turnovers. Out of 36 third-shift personnel, up to one-third might be absent on any given day.

The sanitation crew was responsible first for cleaning and sanitizing all line equipment, the preparation areas, the docks where raw materials were received, and, in the remaining time, other general areas such as the canteen and locker rooms. A quality-assurance auditor ensured that all lines had been properly cleaned and sanitized before production could begin on first shift.

During the day shift, a small crew was responsible for maintaining the facility grounds. Production-line personnel were responsible for housekeeping in the production areas during first and second shifts. Housekeeping was a priority because customers inspected and graded SeaPak and other suppliers on plant cleanliness.

Maintenance

Ensuring that the production lines were up and running was the highest priority of the maintenance department. Day-shift and second-shift maintenance personnel were available to correct any maintenance problems and to adjust equipment, if necessary, to operate at the correct throughput rate. The maintenance department was also responsible for preventive maintenance and for performing scheduled equipment overhauls. Except for the third-shift crew, the maintenance technicians reported to the maintenance supervisors.

In 1993, Art Christianson and Tom Colvin worked on a "total maintenance system" designed to track maintenance done on pieces of equipment. The previous system had not allowed enough detail in the tracking to accommodate different machine configurations. The new system would help with equipment and parts inventory and would record uptime and downtime, along with the causes for downtime. Eventually, the system would help relate maintenance costs to production lines and to particular products.

Changeovers

The third-shift maintenance technicians reported to the shift manager and worked closely with the sanitation crew to perform equipment changeovers. The complexity of the changeovers depended on which pieces of equipment had to be changed over to produce the next scheduled product. Sometimes both front (wet) and back (dry) ends were changed; other times, only one end needed to be changed.

Quality Assurance

SeaPak felt that it had been successful in gaining market share in the last few years because of the quality of its products. A quality auditor was assigned to each line to check for color, count, and form. The auditor randomly selected samples that were analyzed further in the quality assurance lab. For instance, Onion O's were fried and analyzed for consistency in taste and product form.

TEAMWORK AND THE GAINSHARING SYSTEM

The various stages of each line were linked by the continuous nature of each line's process and influenced by the perishability of the product. Consequently, many of the production activities at SeaPak required teamwork. For example, retail display boxes for packaged

toasted bread sticks came out of a machine that formed them, ready to receive a bag of sticks. If the box-forming machine malfunctioned, which it did more often than people would have wished, the bags of sticks passed on by. Other members of the packaging group would then have to pack them manually in bulk boxes that were taken off to the freezer, sometimes to be recycled later through packaging, sometimes to be shipped to institutional customers. In this way, the team had to work together in responding to variations in machine operation.

Recently the company had installed a gainsharing system that would reward employees when the operation as a whole performed well. John Babich designed the system so it would reflect many facets of performance, would be easy to understand, and would provide a sense of achievement for employees, many of whose jobs were repetitive. The system would also raise employee compensation when the plant worked well, which would help reduce turnover in the competitive labor market.

The system computed a gainshare pool each month, half of which would be paid out to employees in an amount per hour each person had worked, the same amount per hour for every employee on the plan. The payout could amount to $100 or more per month for a full-time employee.

The value of each of the six components of the gainshare program depended on how well the plant did compared to a base, and the results were posted for all to see. The components were as follows:

- Product quality (measured by complaints per million pounds)
- Product cost (based on variances)
- Throughput (rate per hour)
- Dumps/write-offs (compared to a base-line amount)
- Safety (based on accidents)
- Housekeeping (as rated periodically in surprise inspections by the general manager)

In a recent month, most of the gainsharing pool had come from the product cost and throughput components. Dumps and safety were negative, housekeeping a little positive, and product quality positive by about 10 percent of the total pool.

THE ORIGINAL PRODUCT-COSTING SYSTEM

Babich explained that the original costing system was not a traditional standard costing system, but it did report variances between this year's costs and a plan based on last year's costs. Variances were shown for material, direct labor, and overhead.

DIRECT COSTS

Direct product costs included labor, raw materials, and packaging supplies used on the production line. Direct labor cost per pound could be easily calculated because the number of workers on a production line and the amount of pounds produced on that line were known. For example, the total labor cost for producing cheese sticks was $11,440 (26 workers × 2 shifts × $5.50 average rate per hour × 40 hours). By dividing the total labor cost by 29,000 pounds, the volume of cheese sticks produced on a particular day, the labor cost per pound was $0.3945.

Raw materials and supplies were calculated similarly. These items were charged to the production line when they were taken out of the warehouse; any raw materials or supplies not used in production were returned at the end of the day, and the production line was credited.

OVERHEAD

Overhead costs (see Exhibit 18-1) were absorbed at a standard amount per pound of each product produced, based on the following computation:

- The total overhead budget was divided 60 percent and 40 percent between the extruded and specialty plants.
- The overhead budget for each plant was then divided 70 percent for fixed costs and 30 percent to variable costs.
- Total expected hours for the year were projected by dividing forecasted volume by product for each of the two plants by the respective production rates for each product.
- Fixed overhead costs were allocated to products based on the percentage of machine hours in each of the two plants required for each product. A fixed cost per pound was then calculated using the forecasted pounds for each product.
- Variable cost per pound was computed by dividing the total variable cost for each plant by the total pounds of all products projected for that plant.

DEVELOPMENT OF ACTIVITY-BASED COSTING

In the early 1990s, Babich had known that the current method of calculating overhead rates was simplistic and created distortions in product costs. For example, costs for fuel and heat for the fryers were allocated over all products, even though one of the five production lines did not have a fryer. Babich also thought some costs were unique to making a product or group of products. Therefore, some potential activities in an ABC system might be required by certain products or groups of products. Because most products were made on only one of the production lines, it would be logical to make each of the five lines an activity. A residual activity called "general facility" could be used to

capture costs that were not clearly attributed to the defined activities. Babich envisioned developing an overhead rate for each of the activities as well as for the residual general-facilities activity and summing the rates to arrive at a total overhead rate for each product. Overhead rates would, in the end, be expressed as dollars per pound of product.

Management was also trying to gain a better grasp on the costs of changeovers. Babich thought these costs might be substantial—especially the cost of downtime and rejected product associated with getting the line up to speed. He was not sure, however, if those costs could be easily identified or if downtime should be included in the overhead rates. Changeovers were usually made during the third shift, alongside cleanup activities, but occasionally took place between shifts and, once in awhile, during a shift.

In late December 1992, Babich and Melissa Nelson, the staff accountant, made a presentation on their ABC study to several members of the company's senior management. During the eight months Babich and Nelson had been working on the system, their many interviews and conversations with people outside the accounting area had gradually helped others learn about ABC. Overall, the company's managers were favorably impressed by what had been done.

Although the general structure of the system was the one foreseen eight months earlier, several changes had been made.

1. The system did not try to group cost centers into activities like production or sanitation. Instead, it used a matrix in a computer spreadsheet, with existing cost centers and cost elements down the left and activities across the top. Using the knowledge she had gained from interviews, Nelson spread the overhead elements to the appropriate activities when there was a reasonable basis for distribution. Amounts that could not be distributed were assigned to the general facilities activity. (Exhibits 18-2 through 18-6 provide an explanation of how this task was accomplished.)

2. An activity called "changeover" was established. The expenses charged to that activity were the salaries of maintenance personnel assigned to do the changeover work.

3. Instead of separating overhead into fixed and variable amounts, each expense element was related to the appropriate cost driver. The costs assigned to the five production lines were translated into cost per hour and converted to cost per pound based on each product's projected pounds per hour. The driver for changeover cost was the number of changeovers required for each product. The driver for product-specific costs was pounds of product. The driver for general-facilities cost was the production-line hours required by the product, with no differentiation among lines.

WHAT DIFFERENCE DID THE ABC SYSTEM MAKE?

Overall, around $12 million in 1992 budgeted manufacturing overhead was considered. After the reassignment of costs, about $9.1 million remained in the general-facilities pool, about $2.2 million was in the five line-specific pools, about $.3 million was in the

product-specific pool, and $.2 million was in each of the product-group and changeover pools.

The effect on product costs was significant. In several cases, total manufacturing cost for a product increased by as much as 6 percent, and in others it decreased 6 percent. Furthermore, the largest changes in both directions applied to some of the high-volume products and, in several cases, amounted to over $200,000 a year.

Some of the main causes for changes in costs were as follows:

- Line 1 was less complex than the other lines: it used a number of fully depreciated components and had no fryer or flash freezer, so fuel, electricity consumption, depreciation, sanitation, and replacement parts were all significantly lower than on the other four lines. The cost per hour was less than one-third that of the other lines. The cost of products that ran on line 1 was, therefore, significantly lower, according to the ABC system.

- The company maintained a purchasing activity in Gloucester, Massachusetts. The products that were made from the fish bought there were charged with that purchasing cost.

- The current cost system charged the fixed 70 percent of overhead using pounds per hour (the remaining 30 percent was considered variable and charged as the same amount per pound for all products in each of the two "plants"), whereas the ABC system charged about 95 percent of overhead using each product's pounds per hour. The effect was to raise the cost of products that had low throughputs per hour and to lower cost of products that had high throughputs.

  On line 2, the packaging system used for small cartons for the retail trade caused throughput to be low, and the packaging-equipment costs (depreciation and maintenance) for that product group were high. Furthermore, fuel costs for line 2 rose because line 1 no longer was charged for fuel. The other three lines also had higher fuel costs.

- Certain special equipment was both expensive to maintain and used on only a few products (e.g., extrusion devices, fish and bread saw blades, carton packaging equipment). ABC charged these costs to appropriate products.

- The changeover costs were reduced for products made on long runs (several days on one item, broken only by third-shift sanitation and possible maintenance work).

- There were offsetting effects. Some products on line 5 had high throughput, but the fryer on that line was estimated to use twice the fuel of the other three fryer lines and, as a newer and more complex line, its depreciation expense was $100,000 a year higher than on any other line.

REFLECTIONS ON THE ABC STUDY

In the spring of 1993, the ABC study was viewed as being useful by both production and marketing managers. Several people noted that the ABC analysis was about "learning what goes on"—about looking at things from a new perspective that revealed where costs were being incurred.

Sometimes the new cost information helped to fill out an already forming picture. Such was the case with the natural onion rings. ABC pointed out the cost of the onion-room processing and, as Babich said later, "provided verification that Brunswick was not the best place to produce natural onion rings." In 1993, production of natural onion rings was shifted to SeaPak's Brownsville, Texas, plant.

When asked how the revised cost information might affect the marketing and selling activity, Jack Kilgore, senior vice president for marketing, said that, recently, the compensation of sales people had been changed from a sales-volume basis to a basis of gross contribution margin (that is, sales revenue minus direct manufacturing costs, including overhead). Because the revised costs would affect margins, the sales people would be influenced by both pricing and the kinds of products they sold.

Kilgore also noted that, besides price, competition concerned quality, product consistency, and service, which meant "on time and as ordered." Because most competitors did pretty well in these areas, other features became important in distinguishing SeaPak. Research and development support was one of these features, as well as logistics (such as streamlined ordering and delivery processes) and reliability of supply. He noted that ABC would "enable us to give better direction to our new product-development group."

In addition to having a direct effect on how the sales and marketing people viewed different products, the ABC study seemed to have affected the way the company analyzed its competitive strategy. The company's strengths, such as extrusion and breading technologies and production efficiencies, were a basis for shaping the line and conversing with customers. The ABC study helped to show how those strengths were supported by activities that affected the use of resources. The company also began to think about strategic alliances with customers and suppliers. ABC would help identify ways SeaPak might gain and contribute to those alliances.

In his presentation to senior management at the end of December 1992, John Babich described several "next steps" with the following outline:

- Analyze the overhead cost pool further
  - identify more activities
  - obtain more information from the total maintenance system
  - target 30-35 percent [of total overhead] for ABC application
- Integrate the model
- Provide the plant floor with more information on which action could be taken

CONTINUED DEVELOPMENT OF ABC

During 1993, Babich increased the portion of overhead subject to ABC distribution from about 22 percent to about 30 percent. The changes involved several areas:

1. In the support area, two changes were made. One change recognized that different lines required different numbers of "audit personnel." One line required three auditors, and the others required either one or two auditors. The auditors focused on specified check points to review quality and operating characteristics. Management recognized that, although inspection was important to insure the product's quality, the best way to achieve quality was to design it into the process from the beginning. The quality auditors became part of a feedback loop that assisted those who worked on the product and process design, helping them produce a perfect product every time. (About 1.8 percent of overhead)

2. A second change in the support area was to pair two of the production lines and have one person supervise both lines. Each line was charged with half the cost of the supervisor. (2.7 percent of overhead)

   Implementation of this change turned out to be more difficult than expected. Supervising two lines simultaneously required significantly more skills in time management, organization, delegation, and paperwork. A supervisor who had done well with one line was not automatically capable of managing two. By May 1994, it was evident that one of the promoted supervisors would not succeed in this position.

3. A portion of overhead was deemed to be related to (driven by) the direct labor on each line. This overhead was mainly in the payroll and human-resource departments. The cost in these departments per person employed was added to the production-line cost according to the standard staffing required by the line. (About 4.0 percent of overhead)

EXTENSION OF ABC TO WAREHOUSE COSTS

SeaPak's Brunswick plant operated a large warehouse that stored frozen foods, about 80 percent finished goods and 20 percent raw materials. The ratio varied during the year, because in seasons when shrimp and fish were easier to obtain, the company would buy ahead and the raw-material ratio would rise. Finished goods on hand varied for different products—as little as one or two weeks for some steady, high-volume sellers, to several months for low-volume products with higher variation.

Overall, the average cost per pound handled was around $.04, about a quarter of the average manufacturing overhead cost per pound. Before SeaPak applied ABC to the warehouse, an average cost of $ .04 was applied to all products. The warehouse managers knew intuitively, however, that some products generated more costs than others.

Most of what the warehouse did could be grouped in two basic activities: storage and handling. The cost of storage was for the space occupied by the pallets on which cases of

frozen food were stored. The cost of handling was primarily for labor and equipment used to move the pallets.

Product characteristics led to the following two differences in the extent to which storage and handling were required:

1. Density in terms of pounds per cubic foot. High-density products meant that many pounds would fit on a pallet and in a storage location so warehouse costs for both storage and handling would be lower per pound of high-density products. Fish and shrimp were high-density items, bread low-density, so clearly, warehouse costs were less for fish and shrimp than for bread.

2. Some of the products used frozen raw materials; others did not. Thus, some products entailed storage and handling costs for both raw materials and finished goods.

OVERHEAD RATES

The computation of overhead rates per pound of each product required a number of data items. First, SeaPak divided total warehouse cost into two cost pools, one for each of the two activities, storage and handling. The division was done by examining the line-item budget and allocating each line to the activities. The result was about one-third storage costs and two-thirds handling costs.

Total pallets moved was estimated by adjusting the known numbers of pallets shipped by such things as shipments of less-than-full pallets. Total handling cost divided by pallets moved gave a cost per pallet moved. (Actually, the pallets were moved twice—once in and once out—but for product-costing purposes, the pairs of movements were used.) For each product, the normal number of pounds per pallet was then used to compute the handling cost per pound.

Storage costs per pallet were computed by dividing the total storage cost per year by the 13,000 pallet positions used. That annual "rent" per position was divided by 360 to arrive at the daily rent per pallet. Average inventory turnover for each product was then used to compute the average number of days in the warehouse. That figure times the rent per day divided by the product's pounds per position gave the storage cost per pound of that product.

The storage and handling cost per pound for both raw materials and finished goods gave the total warehouse cost per pound for each product. Instead of the average $.04 per pound used in the current system, the ABC costs ranged from $.02 to $.12 per pound.

SeaPak expected the ABC rates would be recomputed each year to reflect changes in volume (most warehouse costs were fixed), product mix, and product turnover.

SCHEDULING

Hugh Ferry's responsibility for production scheduling and inventory control put him at the interface between the plant and sales. Sales forecasts and schedules were changed frequently. At a monthly meeting, the production general manager, sales managers, and regional sales managers developed a forecast extending out two months (e.g., May's meeting looked at July). Ferry said accuracy of plus or minus 20 percent was normal on

high- and low-volume items. "It's the medium-volume items that cause problems," he said. "In the end, the question often comes down to, 'How many hoops will production jump through?' The trend has been for customers to keep low inventory." Special promotions and deals with grocery chains could stimulate business and strain the plant capacity.

Different lead times affected the forecast. The purchasing of some food items required a six-month lead; packaging materials usually required eight weeks; other items were ordered as little as ten days in advance. Each week, Ferry produced a daily production schedule for the upcoming four weeks, and each week he made changes. He tried to implement a Tuesday night cut-off for items to be produced the following week, but even then some changes were made after the cut-off.

Managing inventory levels, he said, was a by-product of managing production. Using a spreadsheet program, he combined sales forecasts with available capacity to be sure shipments could be made. For high-volume items, he tried to have one to two weeks of finished product. For other items, he often had more than two week's product because producing less than a shift was uneconomical and one shift's production could be a month or more of shipments. Occasionally, seasonal variations in price, availability of raw materials, and demand caused SeaPak to "take a position" with higher-than-normal inventory. In the winter, for example, Rich-SeaPak experienced high demand for fried foods, yet shrimp was less available and more costly than in the summer.

In the spring of 1994, rising demand had driven the plant to find ways to increase its production. The increased importance of coordination among purchasing, conversion, and marketing/sales had prompted SeaPak to reorganize so that vice presidents were in charge of each area and the three officers could be in constant communication. Babich noted that cycles occurred in demand and capacity: first promotions would stimulate demand, which pushed the plant to develop capacity (for example, by using part of the third shift for production). Then capacity would exceed demand, and promotions would be considered. The cycle would begin again as marketing stimulated demand. This process would extend over months. New business was sought, consistent with the targeted competencies of the plant. Over a number of years Frank Holas, Rich-SeaPak's president, had gradually changed the mindset throughout the organization so that SeaPak's objective, in Babich's words, was to "balance the process, not the functions."

PERFORMANCE MEASURES

Pounds of production were reported hourly, by shift and by day for each production line. Also, shift reports showed usage of direct labor, material, and packaging.

Starting in 1991, Babich had produced a monthly report on "key trends." The report evolved continually, and the 1994 version showed results in terms of quality measures, safety and turnover, financial measures, and some operating indicators (see Exhibit 18-7). The plant itself was a cost center, operated with the underlying assumptions that inventories were managed and that "you don't achieve fixed cost reduction via inventory build." The division, of which the plant was a major part, was an investment center, so a division-level rate of return on investment was computed.

Product and regional contribution margins were measured using revenue and fully absorbed manufacturing costs, including warehouse costs. Babich said this information was "used to ask questions as well as to answer them."

Babich said that Michael Hendley was concerned about what could be described as the boundaries of the operation. SeaPak did not manage to particular inventory levels, but Hendley sometimes noted that "it looks as if we are long on item X." Other important boundaries were product quality, safety, and ethical boundaries such as the way SeaPak treated employees or the hours the company asked employees to work.

BABICH'S AGENDA

In reviewing the development of ABC, Babich said he saw it as "one tool amongst many" available to management. He thought the results said, "Here's the way things are."

One item on his development agenda was improvement of the cycle time for cost estimation on new products. He thought that, not only could the time be shortened, but also the process could be improved. The present system treated the plant as a "magic box" that could produce a proposed product at a specified cost. Babich wanted to open the box so that the marketing, production, product design, and costing perspectives could be integrated. He was intrigued by the Japanese system of target costing and thought that some elements of that system might be useful at SeaPak.

Another item on his agenda was the ongoing development of nonfinancial performance measures. He said that, over time, he had noted an interplay between measures and organizational capability. The measures called attention to important performance dimensions, which stimulated improvement—like a game of leap-frog. He expected the "key trends" report would continue to evolve to include areas such as cycle time and the cost of quality.

EXHIBIT 18-1

RICH-SEAPAK CORPORATION

Overhead Costs

Key:
x = $0-$9,999;
xx = $10,000-$99,999;
xxx = $100,000-$500,000;
xxxx = >$500,000

Cost Center	*Total*
Production	
Fuel	xxx
Depreciation	xxxx
Plant supplies	xxx
General facility	xxxx
General Management	
Salaries	xxxx
Other personnel costs	xxx
Store Room	
Salaries	xxx
Sanitation/Cleanup	
Labor	xxxx
Supplies	xxx
Other	xxx
Maintenance	
Key equipment	xxxx
Changeover	xxx
Other labor	xxxx
General facility	xxxx
Laundry	
Labor and supplies	xx
Factory Services	
Electricity	xxxx
Depreciation	xxx
Uniforms	xx
Supplies	xxx
Water and sewer	xxx
Landfill	xxx
Refuse collection	xx
Security	xx
Other	xxx

EXHIBIT 18-1 (continued)

Key:
x = $0-$9,999;
xx = $10,000-$99,999;
xxx = $100,000-$500,000;
xxxx = >$500,000

Cost Center	*Total*
Personnel	
Salaries	xxx
Other	xxx
Quality Control	
Salaries and wages	xxxx
Material Management	
Salaries	xx
Plant Accounting	
Salaries and equipment	xxx
Gloucester Purchasing	
Salaries	xxx
Other	
Science services	xx
QA admin.	xx
Corp. purchasing	xxx
Total (000,000)	$12.0

EXHIBIT 18-2

RICH-SEAPAK CORPORATION

Distribution of Overhead Costs to Activities

Key:
x = $0-$9,999;
xx = $10,000-$99,999;
xxx = $100,000-$500,000;
xxxx = >$500,000

	Activities					
Cost Center	*Production Lines*	*Product Specific*	*Product Group*	*General Changeover*	*Facilities*	*Total*
Production						
Fuel	xxx					xxx
Depreciation	xxx	xx	xxx		xxx	xxxx
Plant supplies	xx				xxx	xxx
General facility					xxxx	xxxx
General Management						
Salaries					xxxx	xxxx
Other personnel costs					xxx	xxx
Store Room						
Salaries					xxx	xxx
Sanitation/Cleanup						
Labor	xxx	xx			xxx	xxxx
Supplies	xxx	x			xx	xxx
Other					xxx	xxx
Maintenance						
Key equipment	xxx	xx	xx		xxxx	xxxx
Changeover				xxx		xxx
Other labor	xxx				xxx	xxxx
General facility					xxxx	xxxx
Laundry						
Labor and supplies					xx	xx
Security					xx	xx
Other					xxx	xxx

EXHIBIT 18-2 (continued)

Key:
x = $0-$9,999;
xx =$10,000-$99,999;
xxx = $100,000-$500,000;
xxxx = >$500,000

	Activities					
Cost Center	*Production Lines*	*Product Specific*	*Product Group*	*General Changeover*	*Facilities*	*Total*
Factory Services						
Electricity	xxx				xxx	xxxx
Depreciation		x			xxx	xxx
Uniforms					xx	xx
Supplies					xxx	xxx
Water and sewer					xxx	xxx
Landfill					xxx	xxx
Refuse collection					xx	xx
Personnel						
Salaries					xxx	xxx
Other					xxx	xxx
Quality Control						
Salaries and wages					xxxx	xxxx
Material Management						
Salaries					xx	xx
Plant Accounting						
Salaries and equipment					xxx	xxx
Gloucester Purchasing						
Salaries		xxx				xxx
Other						
Science services					xx	xx
QA admin.					xx	xx
Corp. purchasing	—	—	—	—	xxx	xxx
Total (000,000)	$2.2	$.3	$.2	$.2	$9.1	$12.0

EXHIBIT 18-3

RICH-SEAPAK CORPORATION

Distribution of $2.2 Million of Overhead to the Five Production Lines
(dollar figures show relative size)

FUEL CONSUMPTION:

Production line 1	$0x
Production lines 2, 3, 4	$1x
Production line 5	$2x

DEPRECIATION EXPENSE: TAKEN FROM ASSET RECORDS.

Production line 1	$1x
Production lines 2, 3	$3x
Production line 4	$6x
Production line 5	$12x

PLANT SUPPLIES: Estimates by the cost and nature of supplies.

Production lines 1, 3, 4	$1x
Production line 2	$2x
Production line 5	$1.3x

SANITATION COSTS:

Based on the number of people normally assigned to clean each line during the third shift, plus the estimated use of cleaning agents on each line. The number of people were estimated at 3, 4, 5, 4, and 5 for each of the five lines, respectively, 1 for the onion room, and 14 for general cleanup.

MAINTENANCE

Total maintenance for the plant amounted to around $2 million. About one-third was assigned to the five lines, products, and product groups based on information on how workers were assigned, what parts were used for repairs on the line, and product-related equipment.

ELECTRICITY:

About half the total electricity expense was assigned to the four lines that used freezers (lines 2-5).

EXHIBIT 18-4

RICH-SEAPAK CORPORATION

Product-Specific Costs

The following costs were distributed directly to products:

- Depreciation for specialized equipment (such as a fish slicer or extruder designed for a particular product). (Three products)
- Sanitation costs for the onion processor, which applied to one product.
- Key equipment maintenance applied to fish saw blades, onion-ring extrusion heads, and an onion cutter.
- Gloucester purchasing applied to a fish item.

The total dollars accumulated for each product-specific cost was divided by the pounds of product budgeted in order to compute the cost per pound of this overhead category.

EXHIBIT 18-5

RICH-SEAPAK CORPORATION

Product-Group Costs

Product-group costs were for depreciation and maintenance that related to specialized equipment that was used with a group of products. Included were cutters, forming heads, a grinder, a special conveyor used to inspect shrimp, and packaging machinery. Of the fifteen product groups, most had from five to fifteen products, but two groups had just two products, and one group had 48 products.

The total dollars of depreciation and maintenance for each group was divided by the machine hours required by the group, based on expected throughput rate, to obtain a cost per hour, which was then converted to a cost per pound for each product.

EXHIBIT 18-6

RICH-SEAPAK CORPORATION

Computation of Changeover Cost Per Pound

By scanning the weekly schedules, it was possible to determine a normal production run, in hours, for each of the 67 products with budgeted production. The run lengths were distributed as follows:

Normal Run Length (in hours)	*Number of Products*
64	1
32	8
16	30
8	16
4	10
2	2
	67

A total of 906 changeovers was then estimated to be needed for the required production: 652 at the wet end and 498 at the dry end, less 244 wet and dry changeovers. The total changeover cost was divided between the two ends and a cost per changeover computed. The wet end was about 50 percent higher per changeover than the dry end. The number of changeovers per product at each end was used to compute total changeover cost per product, and that figure was divided by pounds of product budgeted to obtain the changeover cost per pound, which varied from under one tenth of a cent to over two cents a pound.

EXHIBIT 18-7

RICH-SEAPAK CORPORATION

Brunswick Plant Key Trends Recap
Monthly Report

Quality Measures	*X Month*
Hold %	0.9
Complaints: retail/MM lbs.	5.0
Complaints: food service	1.0
Write-offs/rework	$10,000
Clean pay scores (housekeeping)	3.5
Product cutting failures (from lab samples of finished product)	1
Safety/Turnover	
Lost-time accidents	0
Medical incidents	2
Turnover (hourly)	4.5%
Financial Measures	
Yield vs. history	.02
Yield vs. plan	(0.001)
Pounds produced	7,500
Overhead cost per lb.—actual	$.15
Run rate vs. plan	98%
Hours earned (lost)	(36)
Actual absorbed vs. planned absorbed	30
Over (under) absorbed vs. planned over (under) absorbed	10
Gainsharing/person (perfect attendance)	$180
Other	
Uptime %	92%
Planned run-rate mix in pounds per hour	4,100
Actual run-rate mix in pounds per hour	4,000