Typical of many subsidiaries and joint ventures with multinationals in Central America through the 1980s, TANIC operated over the years in Nicaragua with considerable autonomy from its parent, British American Tobacco. It was largely self-sufficient, obtaining raw materials from local producers, manufacturing, and selling in the domestic market. Globalization was a distant and abstract concept. When Miguel Trivelli arrived in Nicaragua from Chile to become general manager of TANIC in 1995, this situation was rapidly changing. In response to new policy initiatives, the sourcing of raw materials for Central American subsidiaries had been concentrated in Guatemala and Honduras. A regional office had been established in Costa Rica, communications technology had become standardized, and such functions as purchasing and training were becoming centralized. There was even some discussion of closing the less efficient plants. This process of rationalization, now familiar to multinational subsidiaries operating in more open economies, posed a clear threat to TANIC operations, which had recently suffered quality problems and could have become a candidate for closure. Mr. Trivelli is faced with the challenge of increasing quality and productivity in a difficult environment, impoverished by decades of civil strife and economic crisis. The case centers around Mr. Trivelli’s decision to introduce a new organizational scheme, the “mini-factory,” in the TANIC plant. The scheme is based on self-motivated work teams that operate their own businesses, obtaining inputs from other mini-factories and selling to internal clients. The skeptic can identify numerous reasons why the scheme is destined to fail: workers have low educational levels; they are accustomed only to receiving orders; supervisors and mechanics will offer strong resistance; and managers will oppose the idea. The remainder of the case describes the actions taken by Mr. Trivelli and other TANIC personnel to overcome these problems. Though there was resistance initially, particularly among the mechanics who saw their authority and status diminished, the work team concept offered opportunities for collaboration and learning that were not available under the traditional production system. Information technology was a critical resource that was used to consolidate the work teams. By the close of the case in mid-1997, quality and productivity were at their highest levels, and TANIC had achieved the world’s highest standard in implementing the MRP II production system. The positive results achieved in TANIC illustrate the opportunities offered by technology in leapfrogging from the outdated to the state-of-the-art. Rather than pose an obstacle, the lack of worker education and the dissatisfaction of both supervisors and mechanics made them even more open to change than might have been the case in a more modern plant with a better educated workforce. TANIC demonstrates a dramatic leap from traditional to “generative” management, in which workers take responsibility for performance.

When he arrived at Tabacalera Nicaraguense (TANIC) as General Manager in May 1995, on his desk Miguel Trivelli found a report evaluating product quality showing that the quality index had fallen from 85 to 77% in just three years. He learned that consumers had been complaining of stains on their cigarettes, wobbly ends, cigarettes that felt either very hard or very soft, cigarettes that were perforated along the vein, defective filters, problems in the packaging and others. Mr. Trivelli knew that there was no recycling in the tobacco industry. “If the cigarette is good, you try it; if it’s bad, you throw it away,” he said.

Mr. Trivelli wondered whether the mini-factory system should be implemented at TANIC. Mini-factories are manufacturing cells with a sequential and compact distribution of equipment and personnel. Organization of production in mini-factories has helped other subsidiaries of British American Tobacco to improve the quality of products and efficiency. However, from what Mr. Trivelli had observed the last couple of days in the factory, it didn’t seem as if this type of system could be easily set up in Nicaragua. “This requires a radical change of culture,” he said.

Another option was to improve existing processes and gradually introduce organizational changes to increase efficiency.
and lower costs. The gradual approach was less risky, but Mr. Trivelli did not think it would produce dramatic results in the short term.

The Company

Tabacalera Nicaraguense (TANIC) was established in 1931 by a group of Nicaraguan investors to produce local brands of cigarettes: Esfinge, Valencia, Montecarlo, and Gallitos. The tobacco company’s high level of productivity and technology attracted the attention of British-American Tobacco (B.A.T.), which acquired majority shares in 1952.

The B.A.T. Group of companies, with home offices in London, employed over 52,000 persons in 80 countries all over the world. In 1994, the group sold more than 572 billion cigarettes, representing approximately 10% of total world sales, worth US$20,440,000. The company marketed approximately 250 brands of cigarettes. It had been highly diversified, but at the end of the 1980s the company sold unrelated businesses in order to focus on in two major areas: cigarette sales and financial services, which included insurance and the management of pension funds. It was particularly interested in increasing sales and profits in the emerging economies of Asia, Eastern Europe, and Latin America.

TANIC was one of six B.A.T. companies located in the Central American isthmus (Panama, Costa Rica, Nicaragua, Honduras, El Salvador, and Guatemala), all of which had operated autonomously. Given the processes of trade liberalization and globalization taking place in the world and in the region, the home office in London had announced its decision to establish a regional office in Costa Rica in order to take advantage of any synergies and economies of scale that might exist among the tobacco companies. One of the first measures taken in 1992 and completed before Mr. Trivelli’s arrival was the centralization of tobacco production in Guatemala and Honduras due to quality and cost advantages in these two countries. Previously, TANIC had provided financial and technical assistance to Nicaraguan producers and had also initiated growing some of its own crops.

In early 1995, B.A.T. began to centralize purchasing, finance, communications, human resource policies, and training. Computer equipment and software were standardized, and offices were interconnected by satellite by using a private network. It also was planned to specialize production of low-volume, high-technology brands in one country for regional sale. This policy would eventually result in the closing of factories that were less efficient or had quality problems.

Nicaragua in 1995

The largest country in Central America, covering 130,000 square kilometers and with a population of 4.5 million, Nicaragua had been an agro-exporter of cotton, coffee, sugar, and beef during the 1950s and 1960s. It had been governed by the Somoza family dictatorship, which became increasingly unpopular in the 1970s. After the popular insurrection in 1979, a revolutionary government was set up under the Sandinista National Liberation Front, which began to confiscate large properties and create state enterprises. The inefficient management of these enterprises, the flight business people and capital, plunging prices for traditional exports, a trade embargo, and a war financed by the United States produced an unprecedented economic crisis in the country. Paradoxically, this was also when TANIC experienced its greatest growth in sales, due to the currency devaluation and the incorporation of thousands of young campesinos into the Sandinista Popular Army.

The government-elect of 1990, under Violeta Chamorro, began to privatize the economy and eliminate the price distortions and subsidies created by the Sandinistas. Inflation, at 32,000% in 1987, fell to zero but unemployment rose. There were strikes and work stoppages. Investment failed to arrive in the quantity expected, and the economy stagnated at per capita GDP of barely US$423, one of the lowest in the hemisphere. Purchasing power fell and cigarette sales dropped rapidly.

The situation seemed brighter in 1995. Stabilization policies, inflation controls, and market deregulation were beginning to have positive effects. GDP growth, down to 0.4% in 1993, had risen to 3.3% (slightly more than the growth in population) in 1994, and 1995 growth was projected at 4.2%. Democratic elections would be taking place in 1996, and the favored candidate, Arnoldo Alemán, was promising aggressive action to win the confidence of investors and stimulate the economy. However, the Sandinistas, headed by former President and current candidate Daniel Ortega, were launching a strong campaign against Alemán.

The Market

TANIC was producing and marketing over 130 million cigarettes a month, all with filters, under the brand names of Windsor, Belmont, Casino, and Delta. It also was importing the brand Lucky Strike directly from the United States, despite the 55% tariff imposed on imported cigarettes. Most of the cigarettes were 84 mm, although some 80-mm types also were produced. Cigarettes were principally packaged in 20-unit soft packs and sold to the public at 6 córdobas a pack which in mid-1995 valued approximately $.75 in U.S. dollars. In rural areas and some urban neighborhoods, where purchasing power was lower, cigarettes also were distributed in 10-unit packs that were growing rapidly in popularity. A brand called Belmont was sold in a hard pack to consumers with greater purchasing power.

TANIC’s sales force covered some 15,000 businesses throughout the country, including “pulperías” or small neighborhood stores (87%), bars (5%), mini-supermarkets (4%), liquor stores (2%), and street vendors (2%). They used small
to produce cigarettes, but due to physical differences, they aging. On the vein processing line, tobacco is arranged, spread lowered the total PQRS. The index thus provided information

cigarettes aroma. The leaf goes through a chopper to be cut PQRS was defined for all B.A.T. Group companies, based on

threshing, with the vein remaining as a subproduct of this The quality of the cigarettes produced at TANIC depended

ean. Contraband was equal to just 5% of the market, but this worried Mr. Trivelli because it had been almost zero a few years ago. The 42% cigarette taxes, the highest in the region, were an incentive to smugglers. “In one week you can sell a container of contraband from Panama at the traffic lights at market prices and make a large profit, and there’s no proof of crime because it goes up in smoke,” Mr. Trivelli said. Smuggled cigarettes had supposedly reached 40% of the market in Colombia.

Cigarette Production

Cigarette production at TANIC involved two processes: the preparation of tobacco blends, carried out by the Primary Department (PMD) and manufacture and packaging, performed by the Secondary Department (SMD).

The taste of a cigarette depends on the blend, which is a mixture of different types of tobacco. There are three basic types of tobacco—burley, flue-cured, and oriental—and a cigarette can contain up to 30 different varieties of these types of tobacco. Generally each brand of cigarette has its own blend although some brands can share the same blend.

The tobacco leaf has two parts: the vein, which is the central nerve of the leaf and the leaf itself. Both parts are used to produce cigarettes, but due to physical differences, they are processed separately. Typically the leaf is separated from the vein after the tobacco undergoes a process called green threshing, with the vein remaining as a subproduct of this process.

The PMD occupied a large part of available space in the plant, including the green threshing area. This space was no longer used after TANIC abandoned growing its own tobacco and had become a storage area for machinery and spare parts. Operations were concentrated in another building where tobacco was handled by means of a series of conveyor belts. The department’s function was to provide SMD with tobacco processed into high quality threads.

The work done in PMD was divided into three independent processes: leaf, vein, and threads. In the leaf processing line, bales of tobacco were cut into slices with a guillotine and treated with vapor to apply different types of syrups that give cigarettes aroma. The leaf goes through a chopper to be cut into 28 pieces per inch, giving it the right size for manufacturing cigarettes. Finally, the leaf is dried until it reaches the level of moisture content required for manufacture and packaging. On the vein processing line, tobacco is arranged, spread

out, cut, dried, and then combined with the leaf. The vein has greater filling capacity than leaf and consequently must be processed in choppers that cut it into 180 pieces per inch. In other words, the very weight of the vein tobacco fills a greater volume than that of the leaf. The vein tobacco is expanded by means of rapid application of heat that breaks down water-saturated cells and then dried to keep the vein from collapsing. Once the vein and leaf have undergone these different treatments, they are combined to form the threads for cigarettes.

In SMD tobacco threads are transported to five cigarette-making machines where they are shaped into cylinders, after which the filter is added. (See Figure 1 for a diagram of the process.) As shown in Figure 1, these machines, run by two or three operators, can produce 1,130,000 to 2,280,000 units a day. The cigarettes are then passed through four machines where they are placed into packs for different presentations: (1) Belmont and Windsor, 84 mm in 20-unit packs; (2) Delta and Casino, 84 mm in 20-unit packs; (3) all the brands except Windsor, 84 mm in 10-unit packs; and (4) 80-mm hard packs for Belmont (see Figure 1). Finally, the cigarette packs are placed in cartons, which are then packed into boxes and stored in the finished product warehouse.

Both PMD and SMD work in two 8-hour production shifts a day, five days a week. Production is halted for one hour a day when the entire work force goes to lunch at the workers’ cafeteria. There are two other cafeterias, one for managers and one for office employees. With the two shifts, installed capacity at the factory is estimated at 12 million cigarettes a day, taking into account that the machines must be shut down frequently for mechanical adjustments. The plant is closed during the article month of February to avoid accumulating inventory.

Cigarette Quality

The quality of the cigarettes produced at TANIC depended on tobacco quality as well as consistency in the processes taking place in the primary and secondary departments. Some of the variables measured in these departments were tobacco moisture, weight, cigarette circumference, and the drop in pressure of tobacco inside the cigarette. Every cigarette made at TANIC had to meet specifications developed to satisfy the requisites for a high-quality product. Tolerances within these specifications depended on equipment calibration and maintenance, which was the responsibility of mechanics and electricians working in offices just off the plant floor.

TANIC used Product Quality Rating System, or PQRS, as their point system for measuring the quality of their cigarettes. A cigarette with no defects would have a PQRS of 100%. The PQRS was defined for all B.A.T. Group companies, based on a study of cigarette defects that affected the quality of the smoke or its physical properties, and that irritated the consumer. Each of these defects was given a point score that lowered the total PQRS. The index thus provided information
Figure 1. TANIC: flow of production, machine, capacity, and human resource requirements, 1995. Capacity in millions of cigarettes per day or kilograms in PMD (upper boxed number) and number of operators required per machine (lower boxed number).
on the quality of cigarettes produced by the B.A.T. Group companies and by the competition from the point of view of the consumer.

Quality control in the tobacco industry must be rapid and flexible. "There is no point to having a series of reports on quality that don't come out until 24 hours after five million defective cigarettes have been produced that will then have to be thrown into the garbage," said a quality inspector. "Quality readings have no value unless corrective measures can be taken immediately."

**Organization**

The company was organized by function. The production manager reported directly to the general manager and was responsible for six sections: purchasing, production planning, quality, operations, engineering and maintenance, and security. The production department had 120 employees in all. See Figure 2, which shows an organizational chart for the production department and the number of employees in each unit. Of these 120, half were considered "direct" (operators) and the other half "indirect" (administrators and quality supervisors).

Work procedures were strictly applied. Mr. Trivelli observed a case in which a factory engineer arrived a half-hour late. He was sent home by his immediate supervisor, and the day's salary was deducted from his pay. This action was taken despite the fact that this person worked after hours on a regular basis. In this environment, no operator dared to make any type of decision. "People are used to receiving orders, not to making decisions," commented Miguel Trivelli.

The human resources department was in charge of handling labor complaints. This department also made surveys of the work environment that were standardized by the regional offices in San José. The most recent survey, taken in April 1995, showed motivation under 85 to 90%, which was normal for the B.A.T. Group subsidiaries (see Table 1). The department discovered that part of this lack of motivation was due to perceptions of salary inequalities. Some employees complained that other people with the same job were receiving higher salaries.

Another responsibility of the human resources department was the payroll. TANIC had three different payrolls: weekly for workers, every two weeks for administrative employees; and monthly for managers. Each payroll was done by a different person.

Operators were supervised by quality inspectors and by the mechanics (see Figure 2). The people in these groups had lunch together and generally did not communicate with persons in the other groups. Both quality inspectors and mechanics stayed inside their offices for a good part of the day and did not like going out to on plant floor.

Oscar Baltodano, Production and Logistics Manager in the Production Department, explained to Mr. Trivelli:

The "army" of quality inspectors acted as "police" and generated a quantity of statistical data that nobody used. The "army" of mechanics fixed the equipment when it broke down and then immediately went back to their offices without even waiting to see how the adjustment they had just made would turn out.

One of Mr. Baltodano's responsibilities was to develop production plans for the entire plant. He also had to supply materials for the different departments. He supervised the administrators in charge of raw materials, work-in-process and finished product warehouses. The parts storeroom was the responsibility of the engineering and maintenance department.

There were frequent conflicts between the operations department and production planning, especially when there were no raw materials, such as cigarette paper, and the production line had to be stopped. On other occasions, Mr. Trivelli had observed that the raw materials warehouse was overstocked with paper.

**The Mini-Factory Concept**

The concept of mini-factories was not new to the B.A.T. Group. The concept had been installed several years previously at the plants in Switzerland and England and then in other countries where organizing production in mini-factories had helped the B.A.T. Group companies to improve product quality and process efficiency. Mr. Trivelli, who had worked with mini-factories in B.A.T. Chile, commented that "...this is a concept that has been applied selectively within B.A.T. and is now spreading among all the companies in the Group. But there are no mini-factories yet in Central America. If I decide to go ahead with this, TANIC would be the first B.A.T. Group company in Central America to implement this concept."

Each mini-factory operated under a supplier–customer paradigm; it received inputs from some and sold product to others. The mini-factories directed their people's efforts to satisfying the quality requirements of their "internal customers," improving quality at the exact place where it originated, making it possible to detect problems early. The mini-factories also promoted work in "self-directed teams" by having small groups of people work together to reach common objectives. In addition, the jobs and responsibilities of operators were enhanced. The change toward mini-factories would have an impact on the role of supervision, operators' responsibilities, costs, inventories, flexibility, and coordination. It would open up an opportunity to optimize processes.

According to Mr. Trivelli, "The idea is to have more flexible processes and be able to react more quickly to competition." However, he wasn't sure how difficult it would be to implement this new concept with workers in Nicaragua.

Mr. Trivelli recalled some of the details involved in implementing mini-factories in Chile:
Figure 2. TANIC organizational chart, Production Dept., 1995 (with number of employees in each section).
Table 1. Results of Motivation Survey (April 1995)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Positive Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working environment</td>
<td>76.6</td>
</tr>
<tr>
<td>Communication</td>
<td>81.6</td>
</tr>
<tr>
<td>Clarity of purpose</td>
<td>86.0</td>
</tr>
<tr>
<td>Total quality</td>
<td>84.6</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>77.0</td>
</tr>
<tr>
<td>Supervision and leadership</td>
<td>74.8</td>
</tr>
<tr>
<td>Teamwork</td>
<td>84.4</td>
</tr>
</tbody>
</table>

Source: company records.

As the first step in making the change, we named a team leader for each mini-factory. The team leader is a coordinator who has leadership, who motivates and manages the people and communicates well. The person could come from any of the positions (operator, mechanic, etc.) The team leader is no different than his coworkers in any way, and doesn’t earn any more than they do. He is simply someone who directs the team.

After naming the team leaders, we told the people “from now on, this is your factory, and since this business is yours, you’ll have to see how you manage it.” Our objective was for the operator, who is the one who creates value in the factory, to have the same understanding about lowering the cost of conversion as the financial manager.

Each mini-factory formulated clear and precise objectives on the volume of production, level of quality, percentage of loss, etc. The mini-factories themselves handled the logistics of acquiring the materials they needed and managed their own budget. Trivelli continued:

In Chile, we quantified all the performance measurements for the mini-factories because we began with the premise that you can’t improve anything unless you can measure it. Because if you can’t quantify things, it’s impossible to know whether they’re improving, or even whether they’re getting better instead of getting worse.

With the implementation of mini-factories at TANIC, decision-making power would pass to the employees. An operator would have the autonomy to stop production in his mini-factory if he discovered a quality problem. Likewise, operators would decide when to perform maintenance and how to control costs. This would certainly change the roles of supervisors and mechanics, who would become consultants, and it could cause disorientation among TANIC operators, who were accustomed to receiving orders.

TANIC in 1997

Two years after assuming the position of General Manager at TANIC, Mr. Miguel Trivelli was pondering the changes that had taken place in the company, and he wondered what his priorities for the future should be.

Mr. Trivelli said:

We decided to make a drastic change rather than go gradually. We implemented the concept of mini-factories, we re-engineered the production department, we leveled the structure, we had to drastically reduce personnel and we have begun a change in organizational culture.

Setting up the Mini-Factories

An important element in the process of change was the decision to establish mini-factories. Oscar Baltodano, who had been Planning and Logistics Manager for the Production department, was in charge of implementing this new concept.

Ten mini-factories were created. This number was determined according to plant distribution and the production process. PMD was divided into three mini-factories and SMD into seven, as shown in Table 2.

As Mr. Trivelli had foreseen, implementation of mini-factories created uncertainty and disorientation among employees. He commented:

People were disoriented. It was like we were speaking in Greek to them. It made employees a bit insecure to be the owners of the process, and the team leaders lacked leadership. It was necessary to have a lot of patience in explaining what their new role would be. For example, quality inspectors had to understand that their new work was to train the others in quality, and now all the members of the mini-factory would be responsible for quality, not just that one person. The process of change caused cigarette quality to decrease at the beginning, but afterwards it rose.

But there was more to it than that; we had to give people the tools to do their new work. We couldn’t simply tell an
operator that he was now a team leader, we had to strengthen them with technical and managerial abilities. It was necessary to accept that people were going to make mistakes, and that the people who stayed in the company were not going to get their heads chopped off for making them. A lot of risks were taken; people were given resources. We gave coaching seminars to teach them how to recognize small achievements in order to motivate people. We taught them that sometimes a little praise can be very important for a person and can be more motivating than the pay, and that the sum of these little achievements is a great achievement. We gave them a lot of tools for leadership, including statistical process control (SPC) seminars and computer classes so they could improve the quality of their daily work.

Mr. Baltodano added:

You have to become a salesman and a motivator and stay optimistic. But being a salesman doesn’t mean fooling people; you have to be honest with them and give them the power to make decisions. Now every mini-factory manages its own budget. Mechanics are now training the rest of the team in their mini-factory and they are the owners of the process, they are people who feel "enriched." The idea that operators are the owners of their mini-factory has given them a great sense of belonging.

Despite the training and resources that they were provided, some mini-factories had problems reaching their production objectives. The human resources director, María Inés Zeledón, recalled,

At the beginning there were two mini-factories that weren’t reaching their production objectives because operators hadn’t found the right way to manage the machines, which had mechanical problems and froze up. The poor performance in these mini-factories was evident to all the company personnel, because there is a wall chart that shows all the goals, production from the day before and the problems of all the mini-factories. One day, one of the mini-factories was working so badly that someone put up a sign that said “MINI-FACTORY FOR SALE.” A competitive spirit made the operators of this mini-factory grow, learn more about the process and pay attention to the quality of raw material and the right mixes of tobacco for their machines.

In fact, the team leader of one of the mini-factories with problems was the general secretary of the union. His designation had been a strategy to get him integrated in the work team and to help him concentrate more on improving performance in his mini-factory than on union activities.

Of all the groups affected by the implementation of mini-factories in TANIC, the mechanics were the most resistant to change. Mr. Baltodano remembered:

Traditionally, mechanics fixed the machines and returned to their offices where no one knew what they were doing. Now mechanics "live" on the plant floor and are part of the mini-factories. For some of the older mechanics, especially, this meant they had become "just" workers. It was as if we had stripped them of their “laurels.” There were also problems of professional jealousy between the mechanics in different mini-factories. For example, one mechanic was upset because the mini-factory where another mechanic worked was getting better results than his. Nevertheless, the mechanics were eventually sold on the idea that the change was to their benefit.

One of the factors that helped the mechanics and other groups feel positively about the change was the implementation of a salary adjustment. María Inés Zeledón recalled:

Traditionally, salaries were a taboo subject and there was a great deal of salary inequity among people with the same position. To improve this, first we had to make job descriptions and evaluate positions using a point scale that determined evaluation factors and assigned points to each one. Then we evaluated the internal equity of salaries and put together a new salary scale. All the positions that fell below the new salary scale received an adjustment. Many of the people in these positions, such as the mechanics, were motivated because with the change they were going to earn more. Also, salaries stopped being a taboo subject. Now people know where they are on the salary scale. Generally we used to give a 10% raise across the board for all employees. Now salaries are increased on the basis of employee performance and salaries in the marketplace.

Concerning the future of the mini-factories, Baltodano mentioned:

I think we need to give the team leaders a little more training in coaching and in managing the different social styles of the people in their team. We also have to be careful in handling competition between the mini-factories. Now we’re thinking of having a quality contest, but we still haven’t implemented it because we don’t want to start people competing with one another . . . at TANIC we want seven winners, not one winner and six losers. We still have a lot to learn about the relations between mini-factories.

In the future we want to reach the level where, when we need personnel for a mini-factory, operators themselves interview the candidates and decide who they want to work with. But it all depends on the maturity of people in mini-factories.

Information Technology Support

According to Mr. Trivelli, systems support has been crucial to the success of the mini-factories:
### Table 3. TANIC Attains a Class “B”

**CONGRATULATIONS**

Congratulations to TANIC for achieving class “B” MRPII status. TANIC (Tabacalera Nicaraguense S.A.), located in Nicaragua and part of the Central American area, received class “B” status in June 1997 from David Giles, the MRPII consultant for British American Tobacco. This is the first Chameleon company to attain class “B” status, an important event in the MRPII process toward World Class Excellence.

David said, “Although the results speak for themselves, I was really impressed by the proactive management style at TANIC. Everyone had time to talk with us, and no one got the sensation that there were a lot of lay-offs. The management dedicated most of their time planning for the future and didn’t worry about results today.”

**BACKGROUND**

TANIC is one of the original Chameleon pilot companies. They began implementing MRPII in March 1993, with full development initiated in November of that year. During the last four years the principal team has been changed twice, but not the leader, Oscar Baltodano, who was the keystone of the project. But this achievement is really the result of a great team effort involving Production, Finance, Marketing and Information Technology.

Oscar is now in charge of the factory and with the help of his colleagues has created a series of self-directed teams. Each team is responsible for a production process, including production and materials programming. Quality has also been delegated to operators who stop the process and solve the problem themselves, if control limits are off. The TANIC teams really have power and make decisions on a daily basis that are made by many managers in other operational companies. The team leaders decide what has to be done according to sales and S&OP numbers.

Another sign of success are the recent survey results about attitudes, showing an average percentage of 93% employee satisfaction.

Jorge Redon, regional manager of information technology, says, “The good results obtained by TANIC will provide the framework for developing better MRPII practices in the entire area.”

TANIC has to be seen to be believed, and Oscar has said he’s getting ready to accept visitors that are serious about getting beyond class “C.”


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In order to empower the operators, they have to be given information. So we set up a computer network and put a computer in each mini-factory. With these, the operators can look at the inventory levels of raw materials and parts. Mechanics can open and close their own work orders, and find out their costs and budget. The mini-factories also have software called *Quality on the Shop Floor*, allowing them to record the critical quality variables for maintaining statistical process control (SPC).

Each mini-factory has its own precise goals, and to be able to measure them we need strong support from technology. The mini-factories have computer systems that record and control everything. Everyone who needs a computer here gets one, and that’s that. There is no discussion, studies or justifications. We couldn’t function if we didn’t have systems.

Mr. Trivelli explained that the process of implementing technology was not easy and its success was due to having systems users that were very demanding:

At the beginning, the systems department didn’t understand the production process. It was like speaking two totally different languages. We had to train them. Nevertheless, we users implemented the systems, not the systems department. Instead, that department turned into a consultant, since users were the ones responsible for operating the system.

Several of our managers are young Nicaraguans who, because of the revolution, had lived in the United States, Mexico, Canada or Europe. They were educated there and worked with top companies. Today these managers have returned to Nicaragua and are users demanding users of these systems. Computers are nothing out of the ordinary to them. If the computers aren’t working they’re the ones who complain most and say “get this garbage changed.” They’re always bringing in new things, and they demand quality service and quality systems like no one else. This has been a part of our success.

In June 1997 the team from London gave TANIC a “B” for implementing a production scheduling system, the MRP II, the highest grade in company history (see Table 3). Not even the branches in Switzerland and England have obtained scores higher than a “C.” According to Mr. Trivelli, the explanation lies precisely in Nicaragua’s technological backwardness at that time:

Under the Sandinista government, TANIC’s computer systems were obsolete. There were no foreign earnings and no way to import computer equipment. When it became
possible to import, systems were renovated and the very latest in the market was purchased. Here there was no need to make elaborate justifications or cost-benefit analyses in order to change the system for a better one. These circumstances, along with the fact that we were optimizing our business processes, put us at the cutting edge in terms of computer systems in comparison to the rest of the B.A.T. Group companies in Latin America.

According to Mr. Trivelli, the secret was that TANIC was squeezing every benefit possible out of the technology:

It’s not just a matter of setting up systems, it’s taking maximum advantage of them. I’ve seen more than a thousand systems set up, but there are always parallel systems because people don’t trust the data. At TANIC we have the same systems as other tobacco companies, but with the extra advantage that they are all integrated.

In addition to eliminating a shift, the organizational structure of TANIC’s production department was reduced from six functional areas with many vertical levels. Supervisors were traditionally in charge of floor operators. Above the supervisors was the area manager, who reported to the production manager, who in turn reported to the general manager. With this change, we leveled out the organizational structure to just three levels to be more efficient and optimize

Personnel Cuts
Another change that was implemented in order to improve productivity at TANIC was to eliminate one complete production shift in the Secondary Department (SMD). At the same time, the Primary Department began to work just four days a week rather than five. Mr. Trivelli recalled:

The change was radical—one complete production shift was eliminated, just like that. Before we had 120 people working in two shifts, today we have 60 working just one and producing the same amount. We had to lay off a lot of people. The proportion of direct to indirect employees was 1 to 1; today it’s 2 to 1. Since the majority of the indirect employees were the most expensive, cost reduction was significant.

In addition to eliminating a shift, the organizational structure of TANIC’s production department was reduced from six vertical levels to three (the new structure appears in Figure 3). Maria Inés Zerón, Human Resources Manager, explained:

TANIC’s production department had been organized along functional areas with many vertical levels. Supervisors were traditionally in charge of floor operators. Above the supervisors was the area manager, who reported to the production manager, who in turn reported to the general manager. With this change, we leveled out the organizational structure to just three levels to be more efficient and optimize
processes. Today, we have a country manager who is production manager, with four departmental managers reporting to him. The supervisors and several managerial positions disappeared. Not all the tobacco companies in the B.A.T. Group in Central America have leveled out their structures, because this is quite a drastic change.

Eliminating a shift meant it was necessary to lay off half of the production personnel, or a total of 60 people. María Inés commented:

We made a very careful selection and kept the best workers. We told the people that had to be laid off that it wasn’t because they were bad, just that the company was optimizing its processes and that as a consequence some positions just didn’t exist any more. In the case of supervisors, some decided to leave and others had to be fired because they couldn’t adapt to the change. The important thing is that we tried to handle everything with complete transparency. Even so, it’s not easy to fire people, and it has a high emotional cost.

We did everything possible to minimize the effect of losing a job. We made a commitment to the people laid off that we would help them look for a good job in another company and give them letters of recommendation. We prepared a compensation package recognizing the number of years they had worked in the company and the contribution they had made to the business. We even opened up a bank account for them and negotiated the interest. We really developed a comprehensive relocation plan.

After the layoffs, there was still the challenge of how to motivate the people who remained. Above all, we knew that it was no longer a matter of whether this is my responsibility and that’s someone else’s responsibility. With re-engineering we completely eliminate areas and think in terms of processes.

Administrative Process Redesigning

The changes at TANIC went beyond the production department, affecting the company’s administrative areas and processes, as well. María Inés Zerón recalled:

At TANIC there traditionally were three dining halls: one for the workers, one for administrative employees, and one for managers. During the process of change, we decided to have just one dining hall because we can’t talk about total quality if we have three divisions of employees. This made the workers realize we were treating them differently. Now they could have lunch at the same table as the managers.

TANIC also redesigned processes related to payrolls, the costing system, the sales administration area, purchasing, and finance. María Inés continued:

Just as we had three dining halls, there were three payrolls:
weekly for workers, every two weeks for administrative employees, and monthly for the managers. Each payroll was done by a different person. With the redesign, we all went to one monthly payroll done by the same person.

In addition to redesigning administrative processes, TANIC undertook a subcontracting process (outsourcing) for cafeteria services, medical services, cleaning, and payroll. According to Maria Inês: “Now we even have a bank in the company that pays out wages and salaries. The idea of outsourcing is for us to concentrate on what we’re good at: making and selling cigarettes.”

**Communication for Change**

To make the change the managerial group developed a communications plan. A communications committee was formed that developed a matrix with the most important events in the change process (layoffs, reassignments of responsibilities, implementation of mini-factories, etc.) and a communications plan for the people involved. They developed different plans for different scenarios. There was a departmental agenda, a corporate agenda, an agenda for the union, and an agenda for the press. Maria Inês explained:

If news of the layoffs prompted reporters to ask what we were doing, we had to have a plan for how to respond. We didn’t want the press people to think that the company was closing. Fortunately, it wasn’t necessary to use the agenda that we had prepared for the press.

Mr. Trivelli pointed out the role of human resources administration in conducting the changes process:

Radical change is not something you can do equally in all companies or all countries. Success lies in human resource management, and each manager is responsible for his or her people, their salary, their performance, and their welfare, since that manager is being paid for results produced by the team. The human resources department changes its role and becomes a consultant, providing support and guidance for line managers, who sometimes aren’t aware of the mechanisms and techniques used in human resource administration.

The support of top management, the board of directors, and the home office was considered by several TANIC managers to be a critical factor for success. “There was a big commitment on the part of top management,” said Mr. Baltodano. “Fortunately, Miguel Trivelli trusted us enough to give us the freedom to do what we thought was best. The interesting thing is that we were speaking the same language and thinking alike about the changes that had to take place in the company.”

**Results of the Change**

The changes implemented at TANIC produced positive results in quality and productivity with lower costs and reduced tobacco waste (see Table 4). According to Mr. Trivelli:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>1994</th>
<th>1996</th>
</tr>
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<tbody>
<tr>
<td>Quality (PQRS %)</td>
<td>77.0</td>
<td>85.1</td>
</tr>
<tr>
<td>Productivity (cigarettes per hour/man)</td>
<td>9.390</td>
<td>11.598</td>
</tr>
<tr>
<td>Conversion cost (US$ per thousand cigarettes)</td>
<td>1.07</td>
<td>0.94</td>
</tr>
<tr>
<td>Tobacco waste (%)</td>
<td>5.0</td>
<td>3.4</td>
</tr>
</tbody>
</table>

The conversion cost reached its lowest level in recent years. We are talking about a reduction of almost one million dollars annually. Everything was accomplished with zero investment in machinery and fixed assets, just pure organization and human resources. This year we were the best company in the region in productivity, quality, and costs. After optimizing processes, we are the “benchmark” for all the other tobacco companies in the Group.

**Organizational Culture**

As an important element of change toward a more participative culture, a decision was made to assemble all the company employees once a month in order to communicate the company’s financial results and general performance. The area managers also began to meet once or twice a week with team leaders of the mini-factories, who were the channel for communication with the rest of the team. According to Maria Inês Zerón:

Today there is an extremely rich work culture where no one punches a time clock. Every employee in this company promotes and protects this culture. Staff turnover is zero. Now you can find operators cleaning their machines at 6:30 p.m., with no need for a foreman to keep after them.

An illustration of the change in culture occurred during a visit to the plant by the case writer, who observed one of the mechanics helping pack cartons of cigarettes into boxes for shipping. “Two years ago this would never have occurred,” said Mr. Oscar Baltodano. “But today the mechanics are members of the mini-factory teams and they participate in everything. They don’t lock themselves up in their offices any more.”

The human resources department decided to measure employee satisfaction before, during and after the change. In each measurement the same voluntary survey on work climate was used. (Changes and their results appear in Table 5) Mr. Trivelli remembered that he had been worried about the use of the survey during the process of change:

We didn’t want to do the survey at the end of 1995 because we knew these changes would cause worker instability, and we thought employees would be ready to kill us. But in the survey people recognized that change had been necessary, that it had been done well and they felt better.
Table 5. TANIC Motivation Survey Results

<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Work environment</td>
<td>76.6</td>
<td>87.9</td>
<td>75.7</td>
<td>91.6</td>
<td>91.7</td>
</tr>
<tr>
<td>Communications</td>
<td>81.6</td>
<td>92.3</td>
<td>77.4</td>
<td>91.2</td>
<td>92.2</td>
</tr>
<tr>
<td>Clarity of purpose</td>
<td>86.0</td>
<td>94.6</td>
<td>82.0</td>
<td>91.6</td>
<td>94.3</td>
</tr>
<tr>
<td>Total quality</td>
<td>84.6</td>
<td>95.1</td>
<td>82.4</td>
<td>91.7</td>
<td>92.3</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>77.0</td>
<td>86.2</td>
<td>75.8</td>
<td>87.3</td>
<td>90.7</td>
</tr>
<tr>
<td>Supervision and leadership</td>
<td>74.8</td>
<td>86.4</td>
<td>75.8</td>
<td>83.1</td>
<td>87.0</td>
</tr>
<tr>
<td>Team work</td>
<td>84.4</td>
<td>89.2</td>
<td>79.2</td>
<td>91.1</td>
<td>90.7</td>
</tr>
</tbody>
</table>

Source: Company records.

It was interesting to discover that after the process of change employee satisfaction increased and the work climate was maintained.

Even though the operators demonstrated their satisfaction after the change, management was surprised in 1996 when the satisfaction index dropped. After investigating, management discovered that the reason for dissatisfaction was that the employees had become more demanding. Mr. Trivelli commented:

After November 1995, we learned a big lesson. We realized that when there is a participative and open environment where people are asked how they feel and company performance is communicated to them, people become more demanding. When no one asks them anything and no one gives them any information, they’re grateful for anything they get. The lesson we learned is that in a participative culture you have to be rigorous and consistent, because if there’s even one thing you don’t communicate, it’s taken to mean that everything’s going badly. Employees compare you with the new standard and the organization becomes much more demanding.

**Teaching Note**

**Case Purpose and Teaching Objectives**

The purpose of this case is to develop an understanding of the opportunities and risks involved in implementing a flexible, worker-based organization scheme in a traditional setting. The scheme, known as “mini-factories,” has been tried by TANIC’s parent company in Switzerland and in Chile, but there is some doubt that it can work in Nicaragua, where education levels are low and social foment is high. An important objective of the case is to identify the sources of resistance to change and how this resistance may be overcome. It may also be used to question attitudes about supposedly uneducated workers. Interestingly, the results achieved by the mini-factories in Nicaragua surpassed those of the developed countries, and the general manager believed that the absence of formal education, the poverty levels, and the revolutionary experience made it easier for the workers to absorb radical changes than would have been the case in a more stable environment.

This case may be used in a beginning masters’ level course in production as it enables students to analyze the impact of the mini-factory scheme on production flows and capacity utilization and to apply line-balancing techniques. They must recommend the proper number of plants to balance primary production, cigarette making, and packaging. The case also can be used in a course on organizational design, as one learning objective is to understand the differences between the specialized approach based on function and the mini-factory approach that is based on work teams. In this regard, the following is recommended as prior reading material in preparation for the case analysis: Katzenbach, J. R., Smith, D. K. The Wisdom of Teams: Creating the High-Performance Organization. The Harvard Business School Press, Boston, MA. 1993, chapters 3 and 4.

**Suggested Questions for Discussion**

1. How serious were the problems and challenges that faced Miguel Trivelli as the new general manager of TANIC in 1995?
2. What are the advantages and risks of introducing the mini-factory concept in TANIC?
3. What options did Mr. Trivelli have in May 1995 and which did he choose? Why?
4. Evaluate the results of the actions taken. How were these results attained?

**Case Analysis**

**How Serious Were the Problems and Challenges that Faced Miguel Trivelli as the New General Manager of TANIC in 1995?**

TANIC’s quality index, which is a measure used worldwide by British American tobacco to compare and monitor its subsidiaries, has fallen from 85 to 77 during the past three years. This is below worldwide standards and should be a red flag for the incoming manager, Mr. Trivelli. Moreover, a motivation...
survey conducted among employees in April, just prior to his arrival, indicated relatively low satisfaction levels below the 80% minimum norm for B.A.T. subsidiaries.

It could be argued that these measures are not all that important given the solid position of the company as a monopolistic producer and its history of conflict-free labor relations in a country where labor unions have closed down many factories. Furthermore, it could be argued that low motivation is only natural in an environment of economic stagnation and social discontent. With the economic situation more optimistic in 1995, TANIC should be posed for another era of prosperity.

Or should it? Important changes are occurring in parent company policy in response to the liberalization of Central American economies that are already having strong impact on TANIC operations. Agricultural production, for years supervised by the company’s technical personnel in northern Nicaragua, even in time of war, have now been reconcentrated in Guatemala and Honduras. A regional headquarters has been set up in Costa Rica, and many functions are being centralized. It is evident that corporate headquarters is rationalizing operations in the region and that the less efficient plants might be closed as the barriers to intra-regional trade are eliminated. Seen in this light, TANIC’s declining indicators could have extremely serious consequences for the future.

What Are the Advantages and Risks of Introducing the Mini-factory Concept in TANIC?

A clear advantage of the mini-factories is that they should provide an early-warning system for the detection of quality problems because they are based on the idea of “internal clients” whose demands for quality must be continually satisfied. Furthermore, the jobs of line workers would be broadened and enriched, which should have a positive effect on motivation. As Mr. Trivelli himself observed, the mini-factories would be more flexible than the current production lines, allowing the company to respond rapidly to competition.

“What competition?” a student is bound to ask. TANIC enjoys a monopoly market and the barriers to entry for a second manufacturer are considerable given the company’s well-developed distribution system and the small size of the domestic market. However, a liberalized economy means the threat of more imports, and high taxes on cigarettes provide a strong incentive to contraband traders.

Though there are many potential advantages to the mini-factory scheme, these are mostly based upon the assumption of a receptive and capable work force. There are also powerful potential opponents, such as the quality supervisors and the mechanics, who may feel threatened by the prospect of having their jobs redefined or losing their offices. There is a clear risk that they will derail the process.

What Options Did Mr. Trivelli Have in May 1995 and Which Did He Choose? Why?

It has been established in the previous discussion Mr. Trivelli needs to do something about quality and motivation, otherwise the plant may be closed and the Nicaraguan market supplied from plants in other Central American countries. The mini-factory concept, which has worked in Switzerland and Chile, is a clear option. Another option, more consistent with the managerial traditions at TANIC, would be to take a gradual approach to increasing quality and reducing costs. Students may argue over which approach really entailed more risk in the longer term, but this discussion is more interesting if they do not know which decision was taken or what was its outcome. Therefore, for teaching purposes, it may be preferable to separate the two parts of the case, discuss part one first, then distribute part two.

As is evident in part one, Mr. Trivelli chose to implement the mini-factories because he perceived that a “shock treatment” was required to change the organizational culture. This can lead to an interesting discussion of change tactics and under what circumstances a more gradual approach works well. “Would you recommend the same approach in plant that’s been working fairly well, whose work routines are well established, and where motivation is holding steady at 85?” might stimulate such a discussion.

Evaluate the Results of the Actions Taken. How Are These Results Attained?

Immediately after the implementation of the mini-factories, there was a decline in production, but this was expected. What was not expected was the extent of worker disorientation or the forcefulness of the reaction against the change by the mechanics. The initial preparation, which consisted of a series of seminars on “coaching,” was not enough to make the team leaders or members comfortable with assuming responsibility for the operation of their mini-factories.

Within six months, morale had improved (as evidenced by the motivation questionnaire, November 1995), but in June 1996 there was once again a sharp decline in morale that can be attributed to the personnel reduction program that was carried out: at that time TANIC went from 120 operators in two shifts to 60 in one shift, with no decline in production. After the personnel reduction, the company did everything it could to reassure the remaining employees and to relocate those who had lost their jobs.

By 1997 the mini-factory program could be evaluated as very successful. The quality index had increased from 77% to 85%, higher than previous levels, productivity in cigarette production per worker had increased nearly 25%, costs had been reduced from $1.07 to $0.94 per thousand cigarettes, and waste had been cut from 5 to 3.4%. All motivation indicators were above 90% except supervision at 87%. In June 1997, TANIC was awarded the highest status of any B.A.T. subsidiary in the successful implementation of production planning.

Other evidence of success could be seen in behaviors on the shop floor. Workers with little formal education were using computers as management tools to monitor and control the key quality indicators in cigarette manufacture. Even the mechanics, who were initially dubious, now formed an inte-
gral part of the self-managed teams. The case describes the example of one mechanic who is willingly helping to load cartons of finished product, something he never would have done under the traditional system. The loss of formal status has clearly been replaced by a sense of team belonging.

One explanation for this success is the emphasis that was placed upon communication, particularly after the personnel reduction of 1996. Almost 95% of employees believed that there was clarity of purpose in the company's actions. Miguel Trivelli played a personal role in this, but he also worked closely with María Inés Zerón in the human resources department to orchestrate an effective communications program.

Closely related to communications was information technology. At first workers were reluctant to accept responsibility for mini-factory performance, but they were reassured as they began to understand the power of computer technology in providing each team with the information that its members needed to make decisions. Rather than intimidating, the technology was empowering.

The positive results achieved by the mini-factories were also facilitated by changes in the organizational structure and administrative processes. From six levels, the structure was reduced to three, eliminating bureaucracy and bringing worker teams directly into contact with those who could best support their efforts. The centralized planning and logistics department was eliminated and these functions became the responsibility of each mini-factory, including the warehousing of their own inventories. Food, medical, and cleaning services were outsourced. Even payroll was subcontracted, and the cumbersome system of three payrolls was eliminated. More important for symbolic reasons, the three separate cafeterias were made into one, and the general manager ate lunch beside the production workers.