METAL CONTAINERS, INC., CASE

Metal Containers, Inc., (MC) makes and sells a variety of "tin cans" and other metal containers and products. Two giant companies dominate the manufacturing industry. Some of the large food processors and breweries have captive plants to make their standard sizes of cans. There are a few medium-sized manufacturers and numerous small ones, the latter generally being devoted to specialty work and selling in a local market. (The shipment problem has resulted, even in the large companies, in many decentralized plants.)

MC is one of the medium-sized companies, with sales of about $200 million per year and a total employment of about 1,200. MC was started a few decades ago as a small company in the specialty field. The original plant, in Cleveland, was first devoted mainly to specialties--galvanized pails, lunch pails, trays, housewares. A few years later, it added some lines for making standard cans for fruit and vegetable packing. In addition, MC set up a plant in Milwaukee, mainly to make beer cans for breweries and with some other standard cans for food processors.

Within the last several years, MC has acquired two more plants by buying out the little companies which owned them. The Detroit plant makes large specialty cans for lubricating oil, paint, varnish, etc. The Chicago plant makes mainly standard cans but has a few popular specialty items as well.

The Process

Cans are made from standardized tin plate which is available from a number of steel companies. The plates are decorated on the outside by the can maker, usually by lithographing before forming the can. (Alternatively, the cans are shipped undecorated to the customer who does the decorating, usually by attaching a paper label.) Lithography or other coatings must meet requirements for identity, registration, film weight, color match, appearance, etc.

The decorated or coated sheets then go through a series of operations which shear and slit the plate for the cylindrical part of the can. Dimensional control is paramount here. The end of the can is pressed to shape, and a ring of sealing compound is applied. Dimensional and laboratory control is involved.

The cut plate is fed into an automated transfer machine which forms the cylindrical part of the can, solders the side seam, attaches the end, and double seams the assembly. Numerous dimensional, laboratory, and visual controls are involved.

The can bodies are conveyed to ovens which apply the appropriate inner coatings like lacquer. Since this is the last production operation before shipment, a detailed visual inspection may be applied here by production department sorters. Finally, the cans are conveyed either to storage or direct to the customer.

Manufacture of special cans, pails, boxes, etc., is not automated. Some of the operations are performed one at a time on hand-fed general use machinery. Still others are fully operator controlled. In contrast to the amazing speeds of the can machines, the specialty products are fairly slow paced. The risk of making a huge number of defective units before detection is quite different.

Organization

Until two years ago, MC operated on a regional basis. The manager in each city was pretty much a general manager. But two years ago MC decided to set up functional vice presidents. Mr. Wallace, who had been plant manager at the parent Cleveland plant, became manufacturing vice president. At first, Wallace had no staff and merely supervised the four plant managers directly. But it soon became evident to Wallace that some central staff was needed if the company were to get the benefit of size and to prepare for further expansion. His first staff appointment was a machine development manager in recognition of the important role played, in this business, by good machinery.

Within the last two months, Wallace made his second staff appointment--a quality manager, in the person of Mr. Lafferty. Wallace was driven to this move because he had various quality problems at the plants and could not personally get into them--he was too busy. Wallace's organization chart now looks like this:

Vice president for manufacture
- Plant managers
- Machine development manager
- Quality manager

Each plant is organized as follows:

Plant manager
- Production
- Manufacturing engineering
- Production control
- Standards and cost control
- Quality supervisor

In each plant, the Quality Department is responsible directly to the plant manager. Quality has organized itself as follows:

Quality supervisor
Chief inspectors (one for each shift)
Inspectors
Laboratory

But the plants have different practices for a variety of reasons.

1. The plants differ in size. The parent Cleveland plant, with 600 employees, has a thirty-man Quality Department. The Detroit plant, with 100 employees, has a four-man Quality Department (the boss, a one-man laboratory, and two inspectors). The Chicago plant, also with 100 employees, has a nine-man Quality Department, including a quality engineer and a statistical clerk.

2. The type of product. The mass production lines require quite a different approach from the specialty lines.

3. The plant traditions. The Detroit and Chicago plants still carry many of the habits of the predecessor independent companies. Also, all plants are exhibiting a lot of resistance to regulation from headquarters.

The quality supervisors delegate to their people the inspection of the product. Other duties are generally not delegated. Investigation of quality complaints is handled by a supervisor as is much of the work of clearing shop troubles, etc.

The plant managers look to Production to prevent a recurrence of prior troubles, but they also look to the quality supervisor to follow up and to provide feedback with respect to quality.

On being appointed to his new job, Lafferty spent the first two months going around to the various plants to see the problems and practices. He talked with the people in various departments outside of Manufacture. He also visited some customer installations to see how the product was used and to understand some of the problems faced by MC's marketing people. Now Lafferty must come up with recommendations.

Problems

1. You are Lafferty, the quality manager. During your two months' survey, there were many conflicting statements regarding quality. At company headquarters, the marketing people felt that the plant supervision was spotty--that there were strong and weak people when it came to quality. There was feeling to this effect among the quality supervisors as well.

At the plants, the plant managers and production supervisors had mixed views respecting their operators. The Chicago supervisors felt that their people couldn't be trusted and that the way to run that plant was through reliance on a good system, with penalties for poor quality. At the other extreme, the Detroit supervisors were comfortable about their people and had a lot of doubt about Chicago's approach.

Your own boss, Wallace, wanted you to be sure to get a good reading on quality-mindedness at the plants. Recently, a consultant has been trying to sell Wallace a poster campaign to improve quality in the plants. Wallace has been holding him off to see what you come up with.

What do you recommend to the plant managers and to Mr. Wallace?

2. You are Lafferty, the quality manager. During your two months' survey, you looked at how MC plans for quality. Your findings are summarized below.

Machines, tools, operation sequences: These are specified by manufacturing engineering, except in Detroit, where these functions are handled by production supervision.

Gages: The mechanics are provided with general use gages for dimensional control. (There are a few special gages for standard cans.) In addition, there are some special shears and microscopes to judge the adequacy of the all-important seam configurations. These gages are generally provided by manufacturing engineering.

Process control decisions: Decision making is shown below.

	Decision Made By		
Decision for	Cleveland Milwaukee	Detroit	Chicago
Setup acceptance	Mechanic	Mechanic	Mechanic plus Q
Running acceptance	Mechanic plus Q	Mechanic	Mechanic plus Q
Product acceptance	Quality (Q)	Quality	Quality

There is a widespread belief in the company that can making is not yet a science and that, therefore, much detail must be left to the discretion of the mechanic.

Control criteria: Chicago has gone the farthest. For all control decisions (setup acceptance, running acceptance, and

product acceptance), Chicago has formal criteria--how many to measure, the acceptable level, etc. Detroit has virtually none of this, leaving it all to the judgment of the mechanic and the inspector on the line. Cleveland and Milwaukee have formal criteria for product acceptance but not for setup acceptance or running acceptance.

Records: Except at Chicago, records are pretty sparse. At Chicago, the formal controls throw off a lot of records for so small a plant. These are analyzed and charted.

You have been struck by the fact that Detroit and Chicago operate at such extremes of informality or formality. Evidently, the former owners of the Detroit plant had relied a good deal on the mechanics and had given them a lot of responsibility which they had accepted. In contrast, the Chicago company had tended to use unskilled operators and to rely on engineers, staff people, and consultants to supply instructions, controls, etc.

The question is what to recommend to the plant managers and to your boss as to planning for quality generally. The quality supervisors in the plants want more participation in decision making and in the planning process. Plant managers feel that each plant is "different" and requires special procedures.

Prepare your recommendations on process control.

3. You are Kowalski, the quality supervisor at MC's Cleveland plant. You are in a quandary over recent developments. Two months ago, the company hired a quality manager from the outside --a person who had never been in the can business before. Your old boss, Mr. Wallace, did this. You have a lot of respect for Mr. Wallace, and so you are pretty sure there were some good reasons for setting up such a job and for bringing in an outsider for it. Not only that, the outsider seems to be all right--capable, patient, judicious. He ought to do OK. He has been raising questions about issues which were swept under the rug years ago. That's good. Some of his questions have also made you reexamine some of your own views about responsibility. You have been giving this a lot of thought, and you find that it all boils down to two broad issues:

a. The fact that you will be having two bosses, in a way

b. The new look all of you are taking at responsibility on the factory floor

Wallace went out of his way to explain to you and your boss, Demos, the Cleveland plant manager, that Lafferty will have no responsibility for plant operations. Lafferty's job, as far as

the plants are concerned, is to offer advice, make studies and recommendations, propose methods, etc. The plants have to decide whether they will go along with these proposals. Your boss is still the plant manager, but you are to work closely with Lafferty, supply him with information, help him try new ideas, etc. It all sounds good, but you wonder. They said about the same when a purchasing director was appointed. Now he is doing a lot more than advising. So far, Lafferty has only been going around and learning the ropes. But a fellow with that much on the ball isn't going to be satisfied to take it easy.

Now, as to the factory floor. Lafferty has already been helpful in pointing out some vague spots in the definition of responsibility. He showed that, while the responsibility for setup decisions is with the mechanic, there is no specification for what constitutes a good setup. Hence, the mechanic is really writing the specification, and thousands of cans are made before someone catches up with him. Chicago does have a setup specification, and the mechanic must follow it, make measurements, record them, and so on, as part of the setup procedure. This might be a good idea for Milwaukee where so much depends on the setup being right.

While you have not been able to sell the idea of a quality check on setups, you do have a responsibility for checking the lines while they are running. Your people make visual and gaging checks and report their findings to the mechanics or floor supervisors. Many times, nothing is done about it, and you have had plenty to say to the production supervision about their lack of interest in quality. Now, along comes Lafferty and makes it look different. Lafferty pointed out that the Production and Quality people were talking about two different matters.

Quality (says Lafferty) is concerned about whether the product is acceptable or not, whereas Production is concerned about whether to run the process or not. Lafferty drew this diagram:

	Product Acceptable	Product Not Acceptable
Process is per process specification	RUN	
Process is not per process specification		STOP

What Lafferty was demonstrating was that Quality and Production are together on only two of the four possible combinations. The other two combinations have not been talked out. On top of that, Lafferty thought that the company had at least two ideas about quality standards.

a. The "excellence standard" (meaning that we should try to make MC a quality house). This would involve stopping machines which were outside the process specification even if the product were usable.

b. The "usage standard" (meaning we should base decisions on customer needs). This would permit machines to run so long as the product was usable.

Lafferty's analysis was pretty helpful in explaining some of the seemingly strange actions of production. Some supervisors were willing to revise an off-standard process if they had to stop the machine for other reasons anyhow. But most of them saw no sense in changing a process if the product was acceptable.

You have been talking to Demos about all this. He, too, has been concerned about Lafferty's status. He is also interested in the questions Lafferty raised about responsibility on the factory floor. Demos has asked you to come back with your ideas.

What do you propose to Demos?

4. You are Lafferty, the quality manager. When Wallace hired you, one of his comments was as follows:

> "I'd like to know how many inspectors we need and what should they be doing. Whenever we have problems, the quality supervisors have a list of causes, and invariably, they include in that list 'not enough inspectors.'
>
> It's amazing to me how the plants manage on such different plans. At Cleveland, one person in 20 is in the Quality Department. At Milwaukee, we have 400 people and 20 are in the Quality Department--again one in 20. At Detroit, it's only one in 25. At Chicago, it's one in 11. Are these differences justified? If we could operate them all like Detroit, we could reduce the payroll by 15 people. It isn't only how many. What are we getting? Are we really getting control of quality? Are these people really working on what is important to the company? You are the expert, so after you've had a look around, give me some answers."

Now, you have had your look around. What you have seen certainly doesn't square with your experience. You have had three previous jobs in 16 years as follows:

a. Test engineer in the motor division of a huge electrical company. There, everything was spelled out in great detail --job descriptions, test procedures, records, and the rest.

b. Chief of test for a medium-sized independent making electrical motors--a competitor of your previous company. (You had published a technical paper which attracted attention.) In your new job, you found good use for all that procedural know-how. They had little of it, and they needed it. You supplied it, and all agreed you had done them a lot of good.

c. Chief of test for a company making air conditioners. (They were customers of your previous company, and you had gotten acquainted while on official business.) By now, you were spending some of your time in management of the quality function. You attended some quality conventions and seminars. At one of these, you met Wallace.

From all this experience, you had come to feel that managing the inspection job should be done by:

a. Making a flow sheet of the process and identifying the proper control stations. In MC the key people know the flow fairly well. The inspectors know their areas fairly well. Control stations, while not spelled out, are generally identified.

b. Preparing inspection manuals, instruction sheets, job descriptions, patrol beats, and other forms of detailed lists of duties and responsibilities. Except at Chicago, MC has virtually none of this. Most people have these details in their heads. You are uncomfortable about this--you doubt that people are really doing what they say they are doing.

c. Determining, by estimate or time study, how much resources are needed to carry out these duties, and justifying the resources that way. MC has not done this, and there is a wide variation in quality personnel whether related to sales, production, or production personnel.

d. Keeping records for feedback of quality data. Except at Chicago, there is little of this.

e. Auditing to see that the schedules of inspection were adhered to, records kept, etc. This concept is new to MC.

f. Analysis of records, plus supplemental studies, for quality improvement. In MC, there are few records to analyze, and the work on quality improvement has been done by the production supervision and the manufacturing engineers, with little help from quality.

Also, the plants operate without any incoming inspection of tin plate other than the incidental visual look taken by the lithographers and operators. There is no inspection at shipping. On the other hand, all plants have a number of sorters on the production payroll. Some of these sorters are regulars on the lacquer line. Other sorting is done as part of the means of getting out of a mess. Generally, the production payroll is not subject to as serious challenge as the nonproduction payroll.

The Chicago plant is a puzzler. If all plants were to operate on such a formalized basis, it would be necessary to add over 40 people to the payroll. You are sure no one would buy that.

The Milwaukee plant manager did exhibit some interest in inspection planning. He would like to see the entire process go further down the road to a science rather than being left to the judgment of the mechanics. He points out that, whereas two bad cans out of 1,000 used to be tolerated by the canners and brewers, their automation has proceeded to a point that they now think in terms of 25 bad cans per million as a tolerable level.

Finally, you consider your personal responsibilities. You are now top quality dog in a company for the first time. But you do not have line authority over the quality supervisors--not yet anyway. You are a staff man, and you are to help the plants do a better, more economic quality job. You are also to help Wallace and the other people at headquarters to understand better what the company should do with respect to quality. You are aware that you have never been in this business before, that these plants are small compared to those in which you have operated, and that there are other differences.

What do you propose be done to manage the Quality Departments?

5. You are Lafferty, the new quality manager for MC. With all the newness, it doesn't look too bad. You do have much know-how which they can use, and you have, on your last two jobs, been in the same situation of an expert from the outside who had to get accepted before he could put his know-how to work.

You have also made a survey of yourself. You are now 38 years old with a good record of progress. Each of your previous companies was sorry to see you go--it was just that they couldn't give you a promotion as fast as you found it on the outside. In each case, it was an amiable separation.

In this company, there is no higher quality job. A few years hence, you might move into a bigger company as quality manager. But you aren't sure that you want to do that. Quality has been an exciting specialty, and it has been good to you. But you are

thinking of becoming a manager. Each year, you have been doing more managing and less engineering. You look at what the managers and vice presidents are doing and it looks good to you. They have exciting jobs to do, are well paid, and are looked up to. What more can a person want?

You are pretty sure you can make good on your present job. But this will require more than competence in quality methodology. (Just for dealing with the quality supervisors, it might be enough.) But you will likely find yourself heavily involved with departments you haven't had much to do with--marketing, purchasing, finance, personnel. Being located at the head office, you interact with the executive group. So you know that you need more breadth. On your previous jobs, you participated mainly in technical decisions. Here, you are getting involved in business decisions--marketing strategy, return on investment, and the like.

You have always had some free time, both on the job and off. You used this time to go deeper into quality--statistical methods, quality engineering, and reliability. Now you wonder if this time should address the subject of management--setting objectives, planning, organization, communication.

You have already learned that managing requires a statement of objectives, followed by planning how to meet these objectives. You decide to go through the exercise of trying to reduce to writing the statement of an objective of "where do I go from here?" and then mapping out a plan for getting there.

State your objective and plan.