A Four-Day Intensive Seminar

Quality, Productivity and Competitive Position

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Attendee Roster

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1.

Ch. 2. THE PRISON

Aim of this chapter. The prevailing system of management in the Western World has put us into prison. The aim of this chapter will be to describe the prison, and how to get out of it.

Most people in management know not that they are in prison; that they are hampered by their own management practices. They know not that under today's conditions, these management practices are cause of decline.

How could they know?

It is interesting to note that the prison, the prevailing system of management, has been created by best efforts, not guided by the knowledge that we shall learn in the next chapter.

The prison. We attempt here description of the prison, the prevailing practices of management.
2.

The prison, the prevailing system of management

- Short-term planning. Keep up day by day the price of the company's stock. A sag shows weak management. Ship on the last day of the quarter everything on hand. Move everything possible into accounts receivable. Defer till next quarter (only a day or two off) orders for material and repair. It is wrong to suppose that day-by-day short-term successes will ensure long term success. It is of course imperative to conquer short-term problems that turn up, but no amount of effort and success on short-term problems accomplishes long-term success.

- Ranking people, salesmen, teams, divisions, regions, within the company on (e.g.) sales, profit, new customers, or any other competitive measure, with reward at the top, punishment at the bottom.

This fault arises from failure to understand the meaning of variation. Differences between people, teams, divisions, there will always be. The question is, what is the variation trying to tell us? Wrong interpretation leads to loss of morale and to monetary loss.
3.

Ranking introduces conflict and competition—every man for himself, every salesman for himself, every region for itself, etc.—all of which destroys optimization of the system.


The so-called merit system (annual appraisal of people) is one of the evils that comes from ranking people.

Humiliation from grades and gold stars in school are further examples, from toddlers on up through the university.

- Management by results. Take immediate action on any cost that seems out of line, any fault, any complaint, any delay, accident, breakdown, absenteeism.

  Mind is not required for this kind of management. It is automatic. The result is more trouble, not less.

  What is wrong? Certainly we need good results, but management by results is not the way to get good results. It is action on outcome, not on the causes of results. Costs are not causes: costs come from causes.
This kind of management is tampering (as we shall learn from the experiment on the funnel). It leads to the same kind of trouble that would beset anyone that drove his automobile with his eye on the rear-view mirror (Myron Tribus).

- Confusion between common causes and special causes. Taking action on appearance of a fault, breakdown, accident as if it came from a special cause, when actually it came from common causes. This is tampering. The result is to make things worse.

The converse action is equally wrong--to attribute a fault, breakdown, accident as if it came from common causes, when actually it came from a special cause. The special cause may recur and bring more trouble in the future.

This distinction is especially important in the management of people.
Work standards (quotas, time standards). They:

1. Double your costs. (There are more people constructing quotas and measuring production than there are producing.)
2. Rob people of joy in work. Emphasis is on numbers, not on quality of performance.
3. Shut off any possibility to obtain data to use for improvement of a process. This is so because the figures on production are forced into slots (quotas).

M.B.O. Management by the numbers. (Do it; I don't care how you do it; just do it.)

A company will of course have aims. Likewise, an individual will have aims. But the aim should be improvement of the method of management.

There are of course facts of life. If we don't decrease faulty product to 5% by the end of the year, we shall not be here. This is not M.B.O.

Anybody can make any figure come true if his career depends on it. One can re-state the aim, use new definitions, alter figures by creative accounting.

Solve problems; stamp out fires.

We must certainly solve problems and stamp out fires, but if we spend all our time this way, we make no advance beyond the prevailing system of management.
Vision of escape. The magnitudes of the most important losses from action or inaction by management on these faults and others are unknowable. (Lloyd Nelson, OUT OF THE CRISIS, page 20). We must nevertheless learn how to manage these losses. Failure to tackle them and to conquer them, and to transform management into line with the system of profound knowledge (soon to appear) will only push us into further decline.

It is wrong to suppose that if you can't measure it, you can't manage it—a costly myth.

True: there are organizations that are doing well in spite of the fact that the management follows one or more or all the above bad practices. They are saved by good luck, having a product or service that commands a good market. Just think how much better the company would do were the management to abolish their bad practices.

If anyone were to study such a company, without theory, i.e., without knowing what to look for, he would be tempted to copy the company, on the pretext that "they must be doing things right." He might not be so lucky.
Where are we? Careful thought concerning the origin and effects of the prevailing system of management will come forth with this question: does anybody care about long-term profit?

Why do we ask a question like this? Every manager supposes that he is doing his best to increase profits for the company. He is doing his best; this is the problem. His best is embedded in the prevailing system of management, which as we shall learn, takes no action at all on the most important losses.

The diagram below may show where we are, and what remains to be done.

Theory for leadership
of the transformation

<table>
<thead>
<tr>
<th>Applications</th>
<th>Has penetrated?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall business strategy and planning</td>
<td>Not yet</td>
</tr>
<tr>
<td>Company-wide systems (personnel, systems of reward, legal, financial, management of purchase and inventory)</td>
<td>Not yet</td>
</tr>
<tr>
<td>Unique processes on the shop floor (SQC)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Here are the big gains, waiting
Somehow the theory for transformation has been applied only on the shop floor. Everyone knows about SQC. This is important, but is only a small part of the total. Far bigger gains will come from action on prevailing practices of management.

Transformation into a new system of management is required. It is what I call profound knowledge—knowledge for leadership of transformation. Transformation is not automatic. It must be learned; it must be led. We could look at several layers of application.
Ch. 3. VISION OF NEED FOR TRANSFORMATION

A. Need for Escape

Aim of this chapter. We saw in the last chapter that the prevailing system of management is a prison. We understand why it has led us into decline.

How may we escape? Why should we wish to escape? The answer is that we in the Western World are losing out.

The aim of this book is to provide a foundation or system of theory for continual change of practices for management, to keep up with the changes that are taking place in this world (for example, global supplies and sales), even perhaps to guide the changes to come.

How do we get out? Leadership is required to get out of the prison. Mere knowledge that the prevailing system of management must be changed is necessary but not sufficient.
2.

Change will require transformation. Change will come from leadership. Leadership comes from theory. We can learn only by use of theory. Without theory there is no knowledge. Theory is the product of the mind. Theory enables us to predict results, including the result of a change in practice. Theory can be altered: must sometimes, in the light of observation, be altered. What the mind constructs, the mind can alter.

The barnyard rooster Chanticleer had a theory.

He crowed every morning, putting forth all his energy, flapped his wings. The sun came up. The connexion was clear: his crowing caused the sun to come up. There was no question about his importance.

There came a snag. He forgot one morning to crow. The sun came up anyhow. Crestfallen, he was forced to revise his theory.

Without his theory and its revision, he would have had nothing to revise, nothing to learn.

Plain Euclidean geometry served the world well for a flat earth. Every corollary and every theorem in the book is correct in its own world.

The theory for a flat earth fails when man extends his horizon to bigger buildings, and to roads that go beyond the village. Parallel lines on the earth are no longer equi-distant. The angles of a triangle no longer add up to 180°. Spherical correction is required—a new geometry.

Again, there is nothing wrong with the geometry for a flat earth. It is extension of application that discloses inadequacy of theory, and need for another theory.
3.

The prevailing practices of management grew up 50 to 100 years ago. They were never good, but this country did well in spite of them.

The system of profound knowledge to be introduced in the next chapter is a theory for leadership. A leader of today must adopt a theory for today's world, and must develop an appropriate system for management of his theory. The theory that he requires is knowledge about a system and optimization thereof, to form the subject of the next chapter.

Escape will not be spontaneous. Change can not be forced. Change must be led. Leadership based on knowledge will be required.

An integral part of the system of profound knowledge is appreciation for a system. We hence spend some time in this chapter to develop appreciation of a system. This we do in preparation for study of the next chapter.

B. EXPLANATION OF A SYSTEM

A system of production. The flow diagram shown in Fig. 1 was the spark that in 1950 and onward turned Japan around. It displayed to top management and to engineers a system of production. The Japanese had knowledge, great knowledge, but it was in bits and pieces, uncoordinated. This flow diagram directed their knowledge and efforts into a system of production, geared to the market--namely, prediction of needs of customers.
This flow diagram was on the blackboard all day long at every conference with top management in Japan, beginning in 1950, and all day long through the eight days in the teaching of engineers in various cities.

The way to draw this flow diagram is to start with the customer—what will be his needs. This prediction leads to design of product. Continuation through the cycle, including observations on use of the product in the hands of the customer, leads to redesign—new prediction. The cycle goes on and on, design and re-design. (Contributed by Dr. Barbara Lawton.)

![Diagram]

Fig. 1. Production viewed as a system. Improvement of quality envelops the entire production line, from incoming materials to the consumer, and redesign of product and service for the future. This chart was first used in August 1950 at a conference with top management at the Hotel de Yama on Mount Hakone in Japan. In a service organization, the sources A, B, C, etc., could be sources of data, or work from preceding operations, such as charges (as in a department store), calculation of charges, deposits, withdrawals, inventories in and out, transcriptions, shipping orders, and the like.

Look at the organization this way. Everybody sees where his job is, whom to work with.
5.

To make the flow diagram work, the flow of material and information from any part of the system must match the input requirements of the next stages. Thus, the aim in the flow diagram is for material to come in at the front, and to emerge at the end as usable product. The flow diagram in Fig. 1 describes not only the flow of material, but also the flow of information needed to manage the system. (Contributed by Dr. Barbara Lawton.)

Fig. 1 is actually an organization chart. It shows people what their jobs are, how they should interact with one another as part of a system. Anybody can see from this chart what his job is, and how his work fits with the work of others in the system.

This chart, as an organization chart, is far more meaningful than the usual pyramid. The pyramid only shows responsibilities for reporting, who reports to whom. A pyramid does not describe the system of production. It does not tell anybody how his work fits into the work of other people in the system. If a pyramid conveys any message at all, it is that anybody should first and foremost try to satisfy his boss (get a good rating). A pyramid, as an organization chart, thus destroys the system, if ever one was intended. (This observation comes from Miss Nida Backaitis.)
6.

Any group should have as its aim optimization over time of the larger system that the group operates in. Anything less than optimization of the whole system will bring eventual loss to every component in the system.

The aim suggested here is optimization of the system--everyone gain. The means of interaction between the components of the system, specifically cooperation and competition, must be evaluated in light of the aim. Efforts by competitors, acting jointly or together, aimed at expanding the market and to meet needs not yet served, contribute to optimization for all of them. When the focus of cooperation between competitors is to provide better service to the customer (e.g., lower costs, protection of the environment), everyone comes out ahead.

The system described in Fig. 1 may cover a single company, or, as in Japan 1950, a whole industry. The bigger be the coverage, the bigger be the possible benefits (but the more difficult to manage).

An example of a whole industry as a system appears on page 307 of my book OUT OF THE CRISIS. Dr. William Ouchi was the keynote speaker at a meeting of a trade association in a beautiful resort north of Airport Miami. The meeting was held for three days--each day all day till noon, then out for fishing or golf. Dr. Ouchi explained to the group in his speech, on the morning of the first day, that he likes to go fishing now and then, and sometimes plays golf, but that it might be worth while to remark about the contrast between the activities of this group and that of their direct competitors in Japan. Last month when I was in Tokyo, he explained, I
7.

attended meetings of your direct competitors, 200 companies, tiny and huge, working together as a system--working on design of products, export policy, tests of instruments, so that anybody's oscilloscope would agree with his customer's analyzer. They worked from 8 in the morning till 9 at night, 13 hours a day, 5 days a week: reached consensus after some months of labor.

Who do you think will be ahead five years from now, you or your Japanese competitors?, he asked.

St. Paul understood a system. Excerpts from I. Corinthians, Ch. 12.8. *

A body is not one single organ, but many. Suppose that the foot should say, "Because I am not a hand, I do not belong to the body," it does belong to the body none the less. Suppose that the ear were to say, "Because I am not an eye, I do not belong to the body," it does still belong to the body. If the body were all eye, how could it hear? If the body were all ear, how could it smell?... there are many different organs, but one body. The eye can not say to the hand, "I do not need you."

* Called to my attention by Miss Nida Backaitis at Westminster Abbey, 11 July 1990, this passage being in the second lesson appointed for Evensong for the 11th day of the month.
C. DESTRUCTION OF A SYSTEM

Destruction of the system (contributed by Miss Nida Backaitis). Now, suppose that we take the flow diagram (organization chart) of Fig. 1 and break it up into competitive components—consumer research for one, design of product another, redesign another, each supplier for himself, etc. Every component now becomes competitive with the others. Each one now does his best, by some competitive measure, to make a mark for himself. Can anyone blame him? This is his only hope of survival.

Result: The system is destroyed, causing loss of unknowable magnitude.

Fig. 2. Fig. 1 broken up into competitive segments.
Management of people. In place of judgment of people, ranking them, putting them into slots (outstanding, excellent, on down to unsatisfactory), the aim should be to help people to optimize the system: everybody gain.

ROLE OF A MANAGER OF PEOPLE
This is the new role of manager of people after transformation

1. A manager and his people understand the meaning of a system, and how the work of his group may support these aims.

2. A manager works in cooperation with preceding stages and with following stages toward optimization of the efforts of all stages. He sees his group as a component in a system. (See page 87 of the text.)

3. He understands that all people are different from each other. He tries to create for everybody interest and challenge, and joy in work. He tries to optimize the education, skills, and abilities of everyone to improve. Improvement and innovation are his aim.

4. He is an unceasing learner. He encourages his people to study. He provides, when possible and feasible, seminars and courses for advancement of learning. He encourages continued education in college or university for people that are so inclined.

5. He is coach and counsel, not a judge.
6. He understands a stable system. What to do about mistakes and failures of people, how to help them, what to do about accidents and breakdowns in a stable system, is entirely different from action to take in an unstable system.

7. He has three sources of power:
   1. Formal
   2. Knowledge
   3. Personality

A successful manager of people develops 2 and 3; does not rely on No. 1. He has nevertheless obligation to use No. 1, as this source of power enables him to change the system--equipment, materials, methods--to bring improvement, such as to reduce variation in output. The principles of this paragraph also apply to a leader. (Dr. Robert Klekamp.)

8. He will study results with the aim to improve his work.

9. Another aim is to learn who if anybody is outside the system, in need of special help. Simple rearrangement of the work might be the answer.

These people must not be ranked.
10. He creates trust. He creates freedom and innovation. He is aware that creation of trust requires that he take a risk (Carlisle & Parker, BEYOND NEGOTIATION, Wiley, 1989).

11. He does not expect perfection.

12. He listens and learns without passing judgment on him that he listens to.

13. He will hold a conversation of four hours with every one of his people, at least once a year, not for judgment but merely to listen.

14. He understands the benefits of cooperation and the losses from competition between people and between groups (Alfie Kohn, NO CONTEST, Houghton Mifflin, 1986).

More on pages 117 and 118 of OUT OF THE CRISIS.
Some Notes on Continuing Purchase of Supplies and Service

Point 4

Business on price tag? We consider here a number of worlds. Any theorem is true in its own world. But which world are we in? Which of several worlds makes contact with ours? That is the question.

World 1

1. The customer knows what he wants, and can convey to a supplier his needs in terms of specifications or other description.

2. The price paid is the only cost to consider: no other cost is involved.

3. Several suppliers can without question meet the specifications right down the middle, all equal.

4. The only difference between the suppliers is the prices quoted. One is lowest, including transportation and the cost of doing business with him.

5. The customer has no scruples nor prejudice against any of them.

   In this world, anyone would be a fool not to do business with the lowest bidder.

   We sometimes find ourselves in this kind of world. A homely example is food in a package. Of three grocers handy, one sells it at lowest price. He will get our business.
1. The customer knows what he wants, and can convey to a supplier his needs in terms of specifications or other description.

2. Several suppliers or jobbers can without question supply the material as specified.

3. They all quote identical prices.

4. One of them, however, provides better service than the others. He has inventory, or has access to inventory. His delivery is dependable. When he says that he will deliver the material at 1500 h this Thursday, he means this Thursday, not just some Thursday. The material will come in the right kind of car, and the car will be clean. He will have a man on the customer's receiving platform to give advice to the customer on how to unload the material, and how to store it, if there be risk of handling damage, risk of warp or of aging from wrong temperature, wrong humidity, wrong way to stack the pieces.

In World 2, the customer will do business with the jobber that provides the best service.*

A possible example is sugar. No one could care less what company made the sugar. Sugar is sugar, no matter who made it, no matter who sells it; 998 parts in 1000 are sucrose; the other 2 parts are other kinds of sugar. All six jobbers will quote the same price, the price posted this hour on the Commodities Exchange.

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* I owe this thought to Mr. James Sherman, at that time manager of purchasing for Kimberly Clark in Neenah. Mr. Sherman also had only one outbound motor carrier at any one of his 53 platforms over the U. S. and Canada. He expected this one carrier to provide good service; to make good arrangements with an onward carrier beyond the boundaries of this one carrier. Mr. Sherman was willing to pay this carrier enough to provide the service required, and to make a profit doing it.
1. As in World 1. However, the customer will listen to advice from a supplier. Some changes in his specifications might be worthy of thought.

2. The price paid is not the only cost. There is also the cost of use, predictions of how the material will work in manufacturing, along with consideration of the final quality that will go out the door.

3. Several suppliers tender their proposals, all at different prices, all different in other ways. One or more of them will be concerned about quantities at each delivery, fluctuations of demand, and about the number of days allowed from order to delivery. One or more of them will propose a long-term arrangement, with the aim to follow the customer's use of the material (which might of course be a sub-assembly) in his various stages of manufacture and onward, with the possibility that small changes from time to time, arrived at by joint effort, might turn out to improve performance and decrease overall costs for the customer.

The choice may be difficult. The customer might be wise to divide the business at the outset between two or three suppliers, for further study.

The customer's ultimate aim is continual improvement of quality along with lower costs. Judicious reduction in the number of suppliers, with long-term contracts, for any one item, may seem to offer tempting advantages.
Point 4

Some remarks.

We pause here to recall a few facts of life. Any supplier worthy of consideration possesses specialized knowledge about his products—more than the customer can hope to have, even though the customer will be the user of the supplier's product.

It is good to perceive that customer and suppliers form a system, and that everybody will win on optimization. But cooperation is a two-way street. Can the customer uphold his obligations? The customer has barely enough knowledge to work with one supplier. He will stretch himself too thin to try to work with two suppliers for any one item. Neither of them owes allegiance to the customer. Each of them has his own interests at heart. A customer with several suppliers for any one item is accordingly at a disadvantage.

Another point is that a supplier must be assured of a long-term relationship with the customer in order to make his contribution toward optimization of the system. A one-year contract barely gives the supplier time to get his house in order by the end of the year, at which time the business may go to a competitor.

The idea of several suppliers for any one item, competing with each other for lower prices, as advocated by some authors, makes good talk, but as a practical matter it is only talk, even under long-term contracts. It destroys any possibility of a good relationship between customer and supplier. The losses would be one of those unknowable losses.
On Point 4

Selection of the single supplier. Prime consideration.

Has the suitor for choice sufficient capacity? If not, then he can not entertain any thought of being a single supplier. Two or more suppliers all pushed to capacity is not unusual. I have seen six.

Sudden expansion of a supplier to produce the required volume may turn out to be annoying for both people, customer and supplier, because of variable quality and uncertain delivery, temporary though these may be.

Sudden jump to a single supplier is inadvisable. There are risks. Go slow. It is not a relationship to enter into lightly. The wise customer will take into account a number of characteristics of a candidate, for example:

His record of past performance.

Capacity and ability to meet demands.

Has his management adopted the new philosophy?

Labor-management relations.

Turnover in management.

How much money does he spend for training? for education?

Turnover on the factory floor.

Has he borrowed money from his pension fund?

What rate of interest does he pay his bank? That is, does his banker consider this supplier to be a good risk?
On Point 4

How about relationships between this supplier and his suppliers? Are they happy, or do they indicate external friction?

Does he depend on inspection for quality? Does he have a system of continual improvement of processes?

How important is the customer to the supplier? Will the customer provide but a small fraction of the supplier's business?

How important is the supplier to the customer?

An over-riding criterion is the supplier's burning desire to work with the customer on a long-term relationship backed up by a demonstrable store of specialized knowledge, with management that is trying to adopt the new philosophy.
On Point 4

Advantages of having a single supplier for any one item. A long-term relationship with a single supplier may be a wise decision if customer and supplier play their parts for optimization of the system. Advantages:

1. Customer and supplier working together for mutual gain and satisfaction.
2. Constant improvement of quality, design, and service.
3. Lower and lower costs.
4. Improved profit for both parties.

Obligations of customer and supplier. There is a strong movement toward the single supplier, maybe too strong. It is feared that many people fail to understand their obligations before they enter into this relationship. The customer has distinct obligations to the single supplier. He must concentrate efforts to cooperate with the supplier to optimize the relationship. It may be a new kind of relationship to both customer and supplier.

Heretofore, under the system of business on price tag, and with several suppliers on short-term contracts, such as a year, competitors watched each other. The single supplier faces a new kind of life; he has no competitor to watch. He is alone with his customer. *

The customer has obligation to work with the single supplier, to keep in touch with problems and with help. The days are over when the supplier's obligations end with delivery and acceptance.

* The sense of this paragraph was pointed out to me in 1986 by Mr. Judson Cordes, then manager of the Oldsmobile engine plant of General Motors in Lansing.
On Point 4

It is now common practice for hourly workers of the supplier to see how their product works when somebody tries to use it. What could we do to decrease some of the problems encountered? Conversely, hourly workers of the customer visit the supplier to try to understand his problems, and try to help.

I asked Mr. Ernest Schafer, when he was manager of the Fiero plant, how many suppliers are in your plant any day? About 30. "In olden days, a supplier never came except when we threatened to choke him for poor incoming quality."

It is not an easy matter to receive 30 suppliers in a day, to escort them, introduce them, feed them, treat them with respect.
Point 4

Some of the usual fears about a single supplier.

When he gets a chance, he will choke you, raise his prices. Actually, this has never happened. For sure, a supplier can make an honest mistake in prediction of costs— he can underestimate his costs. Embarrassed, he asks the customer to help him out—either that or he (supplier) may go out of business.

The customer made his choice of supplier. Would he choose a supplier that would choke him if he (supplier) had a chance to do so? Is this the kind of man to choose for a life-long relationship of trust and happiness?

What about a catastrophe?—fire, strike, frozen water mains, somebody bought out the supplier and will discontinue this business. The answer is that we can rely on Murphy's laws. There will be trouble. He that hopes for none is living in some other world. Unfortunately, having two suppliers for every item will only ensure twice as many fires in a year, twice as many strikes, twice as many suppliers that discontinue this business. For more trouble, have more suppliers.

What must the customer do when a catastrophe hits his only supplier for an important item? Get on to his motorcycle and on the telephone and find alternate supplies, temporary or forever. It is no joke. It will happen. We can depend on Murphy's laws.
A suggestion offered by Dr. Joyce Orsini is for a customer to ask the sole supplier, in the event of a catastrophe, to make an arrangement with a competitor, to step in and try to provide (unfortunately on short notice) the material or service required.

This makes good sense because the single supplier, if he is good enough to be chosen as single supplier, knows far better than the customer could know his competitors and what they can do: also how a competitor's product will differ from what is currently being supplied. (Contributed by Dr. Joyce Orsini.)

**Engineering changes.** What about engineering changes, or other changes that the customer makes? These may raise the supplier's costs.

The supplier may have laid in a heavy inventory of material. The customer has a moral obligation to come through with help to the supplier. The customer should either buy it, or help the supplier to sell it.

A forging company laid in a heavy inventory of a special type of bar steel, only to learn after a few weeks that because the customer will make a change, this bar steel will be excess inventory. The customer should buy it, or help the forging company to sell it. The supplier will call by telephone a number of competitors--maybe one of them is looking for just this kind of bar steel. Trade magazines play a helpful part in disposition of excess inventories.
Dealing with Tomato Growers (Suppliers) and our Customers

1. Our Agriculture Operations Department work with farmers to
   a. Select varieties of seeds to be planted to meet our product production plans.
   b. To identify the appropriate cultural practices (irrigation, fertilization) for the specific geographic areas where the tomatoes are grown.
   c. Distribute tomatoes from specific grower, geographic areas to specific plants.

2. Tomato varieties are divided into specific tomato product categories (juice, sauce, whole peeled) to achieve uniformity—consumer perceived consistency.

3. Sensory evaluation tests are performed to constantly seek customer feedback to assure product satisfaction.

Name withheld
**Suppliers of wheat.** Suppliers of tomatoes; chickens. Ask anybody in food business, making cereal to cook or ready cooked, made out of wheat or oats or barley. What about variation in physical characteristics of the incoming grain? To hold this variation to a minimum, the food company will try to confine their purchases to wheat from a prescribed area. If this area has a bad year, the food company will be forced to buy wheat from other areas. The quality is just as good from these other areas, but the food company will suffer severe loss for two weeks from unsaleable product, trying to learn how to use this new wheat, without question just as good, simply different—different enough to cause huge loss.

The same problems or even more difficult confront the food company that puts up whole tomatoes in tins, or tomato sauce, or tomato juice. The tomatoes used for whole tomatoes are very different from the tomatoes that go into tomato sauce, and very different from the tomatoes that go into tomato juice. The food company tries to arrange with farmers for production of the right tomato for each use, and to bring them in to the cannery on a steady basis throughout the season. By knowledge about tomatoes and cooperation, everybody wins.

Similar remarks hold for chickens or any other produce.

Kentucky Fried Chicken in Japan has one supplier of chickens—A Mitsubishi company, which raises chickens and buys chickens from a score of farmers. Uniformity is desired. The chickens have one common characteristic, no variation in age, 46 days.
THE SHEWHART CYCLE
FOR LEARNING AND IMPROVEMENT

THE P D S A CYCLE

ACT *

A P

S D

Plan a change or a test, aimed at improvement.

Carry out the change or the test (preferably on a small scale)

* ACT. Adopt the change.

or Abandon it.

or Run through the cycle again, possibly under different environmental conditions.

Study the results.
What did we learn?
What went wrong?
24 September 1989

MANAGEMENT FOR IMPROVEMENT OF QUALITY
AND PRODUCTIVITY

Overall prerequisite: create environment in which everybody may take joy in his work.

1. Innovation of product and of service
2. Innovation of process
3. Improvement of existing product and service
4. Improvement of existing process.
1.


There are two kinds of reactive behavior. By reactive, I mean reflex action. I put my hand on a hot stove. I yank it off. I do not stop to develop a theory for the transfer of heat. A cat would do the same thing. The two kinds of reactive behavior I will designate as

1. Fear; source known.
2. Anxiety; source unknown.

Of the two, fear is by all odds preferable. Fear is almost always fear of somebody, somebody trying to take over part of your empire, or damning you with fake praise. Fear usually comes from some person, though it could come from fear of an earthquake, source known.

With fear, there is a chance to do something about it. Confess sins. Talk about it, cooperation. Pool resources. Shake hands, be colleagues from here on out.

Unfortunately, there is no such possibility in the state of anxiety. There is no one to talk to. A good example is this.

I see my company on the decline. I wonder what will happen to me.

There is no one to talk to about it. I feel helpless.

Of the two, fear is far preferable.
Examples of fear.

1. I fear that my next annual appraisal may not be good. I may not be eligible for a raise in pay because of my next annual rating. Fear is lodged in the boss, known.

2. I am afraid to admit a mistake.

3. My boss will not wish to listen to suggestions. He shrugs me off at any attempt. I gave up long ago to try to talk to him about any suggestions that I might have for improvement of the work.

With anxiety, there is no one to talk to. In extreme cases, anxiety leads to paralysis. Someone suffering from anxiety may know what he ought to do, but cannot bring himself to do it. What he should do now should have been done long ago. He cannot face it.

A good example comes from Mr. John Perry of Reimer's Express in Winnipeg. Mr. Perry took my seminar. He decided that there are many ways in which companies engaged in motor freight could improve services, lower prices, and improve profits at the same time. Managers in the various cities that Reimer serves need to know more about the problems of their city drivers. He wrote a memorandum to all managers of Reimer's Express: Prince Rupert, Vancouver, Calgary, Saskatoon, Winnipeg, down to Duluth and onward to Chicago, or east to Toronto, Montreal.
The manager in Vancouver called Mr. Perry by telephone some weeks later, so excited that he could hardly tell his story. He had had for years been a city driver that from the very start, after training, came in an hour after all the other drivers had brought their trucks into headquarters for the end of their day. Now this driver comes in an hour after all the other drivers have gone home.

The manager had made up his mind in due time that there was only one solution—train a new driver, and let this man go. This was an unpleasant duty; it could be postponed another week or two without great harm. The months rolled into years. It was then too late. He could not bring himself to replace this driver. The manager knew what to do, but he could not face the problem.

Then came a happy explanation and solution. Vancouver is mountainous on the West. This driver's territory was behind the mountains. The mountains interfered with radio communication with the dispatcher. Radio signals are capricious. Sometimes they come through clear for a minute, then black out. The driver had to drive four miles outside his territory several times a day to Point A on the diagram to clear the mountains, thus to talk with the dispatcher.
The manager rode with the driver a few hours and saw the problem. The problem was mountains.

Solution: give this driver a pocketful of quarters in the morning so that he may use the telephone several times a day, to keep in touch with the dispatcher.

The manager only had to ride a few hours with the driver to understand the problem and the solution.

Why had not the driver said something about it? What could he do? He had a job to do, and did it. His training did not include mountains. Those mountains have been there a long time. They will be there a while yet. He found a way to do his job in spite of mountains.

The point is that the manager had known all these years (so he thought) what to do--replace this driver--but after all these years could not bring himself to it. His anxiety had paralyzed him.

The manager of a client, Ford Motor Company, had posted in huge letters outside his office in the plant, all in jest:

The floggings will continue till morale improves

He thought that it was funny. So did I, until I ran across a card that the employees and supervisors in a company fill out.

Any falsification of information may lead to company discipline, or even to civil or criminal liability.

Such a card was demoralizing to everybody in the company whether he ever filled out the card or not. It creates mistrust. The loss in quality, productivity, and quality of life for the people in this company must be enormous.
INSTRUCTIONS FOR THE WORKING GROUPS

Day 1

1. Introduce yourself to the other members of the Working Group.

2. Each member of the group will read through all the questions.

3. As a group, select at least five questions for discussion by the group.

4. Following discussion, choose two of the five questions to respond to tomorrow morning.

5. Write on the cards provided summaries of the consensus or non-consensus of the group on these two questions.
   . Use one card per question.
   . Show the page and question number in the upper left-hand corner.
   . Elect a spokesman for each of the two questions.
   . Show on the right-hand lower corner the name of the spokesman.

6. Place the completed cards in the basket on the registration table.
QUESTIONS FOR THE WORKING GROUPS

Day 1

1. Why does Dr. Deming propose a system of profound knowledge?

2. What does he mean by a system?

3. Why must there be an aim for a system?

4. Explain why it is that the components of a system cannot by themselves state the aim of the system nor accomplish it. The system must be managed.

5. Whose job is it to clarify the aim of the system?

6. What does Dr. Deming mean by optimization of a system?

7.a. Explain (if you agree) that optimization by which everybody may gain requires re-orientation of the prevailing systems of management in industry, education, and government.

    .b. What changes are required?

8. Give examples of low interdependence between components of a system, and examples of high interdependence.

9.a. Show that for optimization of a system, some divisions in the company may voluntarily operate below maximum profit, or even at a loss. Yet everybody prospers at a maximum, including the division that for optimization of the whole company operated at a loss.

    .b. Why is it that the performance (e.g., sales, profit) of any component such as an individual, team, division, ought for optimization to be evaluated in terms of its contribution to the whole organization, not for its own profit?

10.a. Explain why everybody loses from sub-optimization.

    .b. Give two examples of losses from sub-optimization.

11. Why is precise optimization not necessary? (To answer this, use the Taguchi loss function.)

12. Will enlargement of a committee necessarily improve results?
13. Can you substantiate Dr. Deming's statement that profound knowledge must come from the outside, and by invitation? Or do you have other thoughts?

14. Is it good for people to get together for exchange of ideas? Why is it good? Are there any risks? Will they generate profound knowledge?

15.a. Explain why any rational plan involves prediction.
   b. What do you mean by a rational plan?

16. Explain why interpretation of the results of a test or experiment is prediction.

17. Why is some knowledge of psychology a good idea for a leader or maybe for anybody?

18. What is the job of a manager of people? Is it to rank his people or to help them?

19. What are the sources of power (to help to optimize the system) of a leader?

20. What is the effect of the prevailing system of reward? (Ranking children, people, teams, divisions, companies.) Explain that reward at the top, punishment at the bottom, accentuates the evils of ranking.

21.a. Explain that if ten people, teams, divisions, costs, etc., are compared, one of them will be highest, and one of them will be lowest.
   b. Explain that one or more will be below average, no matter whether they all be superb, or all of them be in disgrace.

22. Where has innovation of product come from, as a matter of history, from the customer, or from the producer?

23.a. What is a requisite for innovation?
   b. What forces smother innovation?

24. What forces build up extrinsic motivation?

25. What may be the result of over-justification? Does your company furnish examples?
26.a. Explain why best efforts can do more harm than good.

.b. Explain that we need best efforts guided by theory.

27. What are some of the changes that Dr. Deming says must be made in the prevailing style of management and in education in order to nurture intrinsic motivation and self esteem?

28. What does he say would be the effect? (Answer: move toward joy in work, joy in learning, cooperation.)

29. Explain why it is that solving problems, stamping out fires, patchwork, cosmetic changes, are not the transformation that Dr. Deming talks about?

30. What is the effect of work standards (quotas, hourly, daily, weekly)?

Point 1

1. How does a statement of constancy of purpose help people in the company to understand what their jobs are?

2. How are the following people served by a statement of constancy of purpose?

   Employees
   Hourly
   Salaried
   Management

   The country
   Customers
   Suppliers
   Stockholders

   The community

3. Why is it good for anyone to have a theory for accomplishment of an aim?

4. What might be the effect if the management were to issue a statement of constancy of purpose and not provide a climate for fulfillment? Would some faulty management practices (such as M.B.O., merit system, incentive pay) nullify a statement of constancy of purpose?

5. Can Point 1 be separated from the remaining 13 points? Can any of the points be separated from the others? What is the aim and the theory behind the 14 points?
Point 2

6. How could you help top management to learn the new philosophy? How could you help them to put it into practice?

7. What may a satisfied customer do? (Switch.) What kind of customer do we need? Where is the source of greatest profit?

Point 3

8. Explain why we shall almost always need inspection of product and of service.

9.a. Can you name some examples where 100% inspection is more economical than no inspection? (Chapter 15 will help on this question.)

.b. What might you mean by 100% inspection?

.c. Describe examples in which 100% inspection is good management.

.d. Describe examples in which 100% inspection is mere dilution of responsibility. Explain the dangers of diluted responsibility.

10.a. What comments do you have in respect to audit of compliance?

.b. "Put on four more inspectors?" Will they improve outgoing quality? For how long? At what cost? What might be a better way?

11. If two or more inspectors work on the same stream of product, under what conditions may we compare their results to learn whether we have a system of inspection? (See page 262 of the text.)

Point 4

12. a. Under what conditions would price-tag be a good basis for award of business? Are these conditions ever met in the world of experience?

.b. Explain conditions under which business on price-tag alone could be ruinous.

.c. Under what conditions would it be a good principle?

13. What should be the aims of customer and supplier? Explain how cooperation brings greater profit to both?
14. Contrast long-term relationship of loyalty and trust with the traditional practice of doing business on price-tag with short-term contracts. (Long-term relationship implies continual joint effort to improve quality and to decrease costs.)

15. a. Explain that uniformity should be one of the aims in purchase of materials and service.

   b. Might a long-term contract with a sole supplier increase the number of options for cooperation between customer and supplier?

16. What are some of the advantages of having a single supplier for any one item of product or service?

   Incoming manufactured material or sub-assembly
   Manufactured product
   Service
   A commodity

17. What about batteries and standby generating equipment to throw into duty in the event of failure of the main source of electricity? Is this an example of a second supplier for a service?

18. a. Are the obligations of customer and supplier to each other intensified if the supplier be the sole supplier for an item?

   b. Is investment on the part of the supplier more attractive under a long-term contract?

19. a. What in your judgment are some important criteria for choice of single supplier?

   b. Why might you not be hasty in your choice?

20. a. Are there some risks in having a sole supplier for an item?

   b. Would two suppliers eliminate these risks or multiply them?

21. A pamphlet on the obligations of a supplier contained this statement:

   The supplier is responsible for the quality of his product.

   a. What is wrong with this statement?

   b. Can either one alone, supplier or customer, be the sole judge?
6.

c. Would this statement build a fruitful relationship between supplier and customer?

d. Does the customer always know what he needs? (No. Under good relationship between customer and supplier, they will work together to arrive at the most economical satisfaction of the needs of the customer.)

22. After a considerable amount of worry, the vice-president of manufacturing concludes that costs for a certain sub-assembly are too high. He asks the purchasing department to get new bids on all parts that go into the sub-assembly. What effects might this have on the cost and quality of the final product?

23. A customer sent out notice to all suppliers:

We expect 5% decrease in cost every year for five years.

What might well be the effect? Would suppliers try to meet the demand? How? What might happen to their quality? Will this demand build good relationship between customer and supplier? Does this demand absolve the customer from responsibility? Is this a good example of M.B.O.? Why not 6% per year?

Point 5

24. What are four requirements for improvement of quality?

25. What are some essential conditions for improvement?

26. Have you observed some improvement during the past two years in the product and service that you purchase? Some deterioration?

27. What about your own work? How have you improved in your work? In your relationship with other people?

28. Why may better uniformity of output decrease costs? What about better uniformity in time of delivery? (See page 477.)

29. If your company had a monopoly or unassailable position in some product or service, what would you say about the obligation of your company to improve product, quality, and productivity?
7.

Day 2

The general instructions for the Working Groups are the same as for Day 1.

THE RED BEADS

1. What information would it have been good for the management to have in hand before they set a price on white beads?

2. Why was it futile to set three beads or fewer as a numerical goal?

3. What was wrong with the merit system that rewarded the worker with the fewest red beads any day? Why was it wrong to put on probation the worker with the greatest number of red beads any day?

4. What is wrong with pay for performance?

5. Would it have been good if the management had collaborated with the supplier of beads to try to reduce the proportion of red beads in the incoming material?

6. What was wrong with the management's decision to keep the place open with the best workers? Explain that management is not playing games; management is prediction. What rational basis was there for prediction that the best workers in the past would be best in the future? (None.)

7. How might the Willing Workers have improved their output of white beads had they been granted the privilege to try out suggestions on improvement of procedures?

8. What did the control limits tell us?

9. What are some of the advantages of a system that is stable enough to use for prediction? (The control limits for a stable system if extended into the future provide prediction of variation in the number of red beads in a workload, and of the average, and of output.)

10. Suppose that you decided to repeat the experiment on the Red Beads under the same conditions. What would you mean by the same conditions?

   Same paddle? Yes. See data on different paddles.
   Same beads? Yes. The results with different beads--same number red and white--could be very different.
   Same procedures? Yes. How would you accomplish this?
11. What barriers (red beads) may there be to pride of workmanship in your own job?

12. Suppose that this company, working with the supplier of beads, was so successful that the average number of red beads per workload was five (instead of somewhere between 9 and 10). What would be the new control limits, and hence the variation to expect in the near future? (Answer. 11.4 for the upper limit and 0 for the lower limit.) The arithmetic gives 5 ± 6.4 for the control limits. We use 0 for the lower limit because a negative number of red beads is meaningless.

Point 6

1. State some important principles in learning and in teaching a skill. Why is it necessary to provide training in different ways? (Page 52 and Chapter 8.)

Point 7

2. Explain why it is that about half of any group will be below average, no matter how figures on performance be obtained, whether the figures make sense or not.

3. (Refer to the bottom of page 54 in the text.) The system of production of defective items was stable.

   a. Explain the principle by which the supervisor here, with the best of intentions, best efforts, only made matters worse by showing to her people the mistakes that they made today.

   b. Under what conditions would it be good to show people their mistakes?

Point 8

4.a. Give some examples of fear and of anxiety.
   .b. Try to distinguish between fear and anxiety.

5.a. What are some sources of fear and mistrust?
   .b. How do fear and mistrust affect performance?

6.a. Name some possible causes of excessive anxiety.
   .b. How does excessive anxiety affect performance?

7. Anxiety about job security seems to be on the minds of many people, management and hourly workers.
   .a. Take for example some plant that closed. Did it close because of laxness on the part of the people that worked there?

   b. Will punctuality, hard work, best efforts, guarantee job security?

   c. What must management do to enhance job security?
9.

8. A bank closed. Did it close because of sluggishness and mistakes of tellers? Because of mistakes in bank statements? mistakes in calculation of interest due? No. Why did it close?

9. Why have many attempts at QC-Circles, Employee Involvement, Quality of Work Life, fizzled out after a few months? What are some conditions for success of such activities?

Point 9

10. Describe a systematic way in which three staff areas may by cooperation optimize their own profits. Would each staff area choose to maximize its own profit on every option? (No.)

11. How many options in total do you suppose the 200 companies mentioned by Dr. Ouchi on page 307 of the text considered? (Hundreds.)

Point 10

12. What is wrong with posters and slogans that ask workers in the plant to take pride in their work?

13. What about the poster, "Do it right the first time."?

14. What type of message on posters might be good?

Point 11

15. What happens when a work standard (time standard, quota) is replaced by competent leadership? (Productivity and quality go up.)

16. The President of a company asks for a report and resolution of every failure to meet a figure, every time one week falls short in some way of the week before, production in one hour falls short of the quota. What is wrong with this kind of management (management by results)? (Tampering; making things worse.)

17. Explain that a company and an individual must have aims, vision, challenge, anxiety in some reasonable amount.

18. Describe the Shewhart Cycle of Learning, a flow diagram for learning or for improvement: the P, D, S, A Cycle.
19. What are some of the handicaps that affect your own work?

20. Which of these handicaps may be of your own making?

21. Which handicaps can be corrected locally? Which handicaps require action by management?

22. How might management learn about these handicaps?

23. In what ways might a company help and encourage employees to continue their education?

24. Who is responsible for the transformation of an organization? How can everybody help? (Some suggestions are on page 86 of the text.) Could you add some thoughts?

General

1. Explain some of the sources of heaviest loss from the prevailing system of management. Explain that these losses can not be measured, yet these losses must be managed.

2. Explain why it is wrong to suppose that if you can not measure something, you can not manage it—a costly myth.
11.

Day 3

INSTRUCTIONS FOR THE WORKING GROUPS

The questions for this day fall into five categories:

Funnel and tampering
Some other faulty practices
Questions on later chapters
Theory of knowledge
Operational definitions

Some of these topics have not yet been covered. You may have to do some study of the text to complete your work.

The group will elect a spokesman for each category of questions (5 categories). The job of the spokesman will be the same as was prescribed for Day 1 and Day 2. He will write on a card a summary of the consensus or non-consensus of the group.

One card per category.
Show the category in the upper-left hand corner.
Show in the lower left-hand corner the number of the Working Group, and to the right of the group number the name of the spokesman.
Place the completed cards in the basket on the registration table.
On the Funnel and Tampering

1. Write down on the cards provided some examples of Rules 2, 3, 4 of the funnel (tampering) that you have observed in your own company; in other companies; in government; in education; anywhere else. It is permissible to include examples described by Dr. Deming, but it would be good to add 10 more.

   It is not important to remember by number the four rules for tampering that Dr. Deming described.

2. Do we like faults, defects, late deliveries, mistakes, accidents? Of course not, but what do we accomplish by action on a stable process on appearance of a fault, defect, red bead? (Answer: We increase the frequency of faults in the future. See p. 20, Dr. Nelson, paragraph 4.)

3. How would you describe tampering?

4. Can you measure the loss from tampering? (No.) Ought we manage it?

Some other faulty practices

1. What is wrong with incentive pay, or pay for performance (in number, dollars)? What is the result?
   a. Emphasis on numbers? dollars sold?
   b. What may be the results when salesmen are paid for performance? What may be the results when they are offered a bonus for reaching or exceeding a target by the end of June? Suggestions:

      Offers to a customer an authorized discount. What is the result?

      Promises immediate delivery.

      Sells a customer more than he (customer) needs. Who loses? Who wins?
13.

Salesman of life insurance sells more insurance than the customer can handle. Customer drops the policy; can't pay the premium. Who loses? Who wins?

A salesman for a copying machine sells to a customer a fancier machine than the customer needs. Who loses? Who wins?

Explain the effect of urgent appeal to salesmen to make new records during the last month of the fiscal year. (Suggestion: management thinks that business is spurring; prepares for increase in business, only to suffer later the costs of over-expansion.)

2. What may be the losses from an over-enthusiastic forecast?


.b. Give two examples.

.c. What was the effect?

4. Daily or weekly quota.

a. What does it emphasize? (Number.)

b. Explain why it is that a quota demolishes any possibility to learn whether the system is stable.

c. Hence, a quota demolishes any chance to improve the system and to achieve greater output and better quality. Explain this.

d. What would happen if a plant manager ever reported production above his quota for the day?

e. Same question for an individual worker.

5. A business plan consists of a matrix of targets, perhaps by quarter. Explain why it is that quarterly reports on the plan demolish any chance to improve the system (i.e., to decrease costs, or to shorten the time between stages of development and production). Is this a form of M.B.O.?
Questions on later chapters

1. What may be wrong with automatic compensation to hold pieces within specifications to achieve zero defects? (William Scherkenbach's book, page 30).

2. Describe the two mistakes that people may make in response to a fault, complaint, accident, mistake. (Page 318.) Do they both cause loss?

3. Why not reduce both of them to zero frequency of occurrence?

4. What did Dr. Shewhart propose?

5. Under what conditions does a process have a capability?

6. Suppose that someone says this (page 334):

   We are meeting specifications. We don't need to worry about statistical control of the process.

   Why is this risky? What is wrong with this rule?

7. May a process be in statistical control (stable, predictable) yet turn out, dependably, a predictable fraction of defective items (faults, mistakes)? (Yes.) Is the cost of these faults predictable? (Yes.) What should we try to do? When should we screen the output? (See Chapter 15.)

8. What is wrong with use of specification limits as control limits? (Tampering it is, making things worse.)

9. Could anyone compute the loss caused by this mistake?

10. Why does just in time require statistical control of processes?

11. Suppose that the difference between (a) repeated measurement taken on an instrument intended for use, and (b) a measurement taken on the standard, are "statistically significantly different." Is statistical significance a basis for adjustment? Why not? What principle ought to govern the decision on whether to adjust the instrument intended for use?
12. Why is it desirable that use of instruments and gauges should show statistical control?

13. The chief accountant of a division asks for an explanation of any cost that departs more than 10% from the budget. What is wrong with this practice? Will this practice decrease or help to understand the causes of costs, and to decrease costs in the future? (No.)

14. Describe some run charts or control charts that may be helpful to management. The list may of course be varied and extended. Points may be plotted weekly or monthly. Suggestions:

   Accounts receivable, cause of delay in payment
   
   Alleged wrong count
   Alleged poor quality
   Shipped to wrong address
   Invoice fails to show discount promised by salesman
   Goods arrived too late
   Other

   Absences
   Accidents, number, time lost
   Proportion of orders shipped on time
   Poor quality of some important product or service, in and out
   Number of new customers
   Number of failure in the premises to indicate presence of hazardous material or danger

15. Which charts (these or others) have you found to be most useful? Which ones showed a stable system?

16. Explain why the action to be taken is different when a chart show a stable state from the action to take in an unstable state.
Theory of Knowledge

1. Why is it that planning requires prediction? (Give some simple example.)

2. Is substantive knowledge necessary for useful prediction? (Yes.)

3. Does a large number of examples establish a theory? (No.)

4. Does a single unexplained failure require abandonment or modification of a theory? (Yes.)

5. May one construct a theory based on one example? (Yes.)

6. Can degree of belief in a prediction be quantified as .8, .9, .99? (No.)

7. Why is it that experience by itself teaches nothing?

8. Explain why studies of examples without theory are almost sure to mislead him that studies them?

9. What is a requirement for knowledge--i.e., when does a statement convey knowledge? (Answer. When it predicts.)
17.

Operational Definitions

10. What is an operational definiton?

11. Why are operational definitions desirable for business?

12. Read the following specifications. Which ones satisfy the criteria for an operational definiton?

Specifications

HSLA SHEET STEEL - NO SCRATCHES

PINION GEAR BAR STOCK - HOMOGENEOUS MICROSTRUCTURE
BLOCKY FERRITE AND PEARLITE

AXLE TUBE OD - MUST BE ROUND

OUTPUT SHAFT SURFACE HARDNESS - \( R_c \) 55 TO \( R_c \) 57

SPRINGS - MUST BE CLEAN

RESISTORS - 150 K\( \Omega \) 2 WATT

BEARING JOURNAL SURFACE - AVERAGE ROUGHNESS 8 TO 15,
PEAK COUNT 80 TO 100

CONSIDER THESE AS OBJECTIVES:

IMPERCEPTIBLE SHIFT

IMPROVED FUEL ECONOMY

BEST-IN-CLASS TRANSMISSION

IMPROVED PERSONAL PRODUCTIVITY