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"UNION AND HARMONY WITH TQC"

from "Total Quality Control," Vol. 44, No. 4 (April. 1993) JUSE

Koichi NAKAMURA
President, Sankyu, Inc.

Sankyu isn't a manufacturing company. Rather, we do a large-scale business in the fields of physical distribution, installing and maintaining machinery and plants, public engineering and construction. And we have offices located abroad as well as here in Japan. So I suppose you can define our firm as an integrated service operation of a revolutionary new type, with people serving as the medium.

Aiming at the rapidly approaching twenty-first century, we've adopted as our company policies a well-balanced business organization, harmony among our employees, the innovation of ideas and the structuring of technology.

In order to achieve our goals, we've undertaken TQC activities. Right now we're trying to attain three main objectives of TQC: policy management, daily management and self-management, which we refer to in Japanese as JK, or *Jishu–kanri*. As for daily management, we'd like to keep in perfect order the various types of data we've so far dispersed. But if we depend on data too heavily, we make mistakes in our judgement–or there's the possibility that our corporate characteristics may become too ordinary. For this reason I always stress the importance of KDD: *Keiken*, or experience, *Kan*, or intuition, and *Dokyo*, or determination. And our staff understands this well.

By so doing, we're trying to establish intermediate and long-range management visions, and with the help of policy management we'll accomplish them. What's difficult in the promotion of TQC is that, as I mentioned, each of our industrial divisions–physical distribution, machine installation and construction–has its own working system. Thus we've developed a form of self-management for each and strengthened it to create a major flow of TQC activities under the main theme, "How can we improve the level of our service?"

But I haven't told you our corporate motto yet. It's "Put your promises into action, ask questions, and be thankful." To put our promises into action means that once we've publicly promised something, we'll be encouraged by the commitment and exert efforts with assurance to fulfill it. To ask questions means to judge matters placing oneself in the position of the other person. Being thankful carries the meaning that we should return thanks to those who surround us.

If we apply our threefold company motto in our TQC activities, putting promises into action indicates that once a goal has been established, all of us should work to realize it under policy management. Asking questions, as regards to TQC, denotes that we should look at things squarely to find the proper direction and turn to the PDCA–Plan, Do, Check, Action-cycle. And being thankful, when applied to TQC, represents a market-in concept.

I tell my staff that something like TQC has always existed at Sankyu. Taking advantage of this tradition, we'd like to imbue our employees with the concept of TQC as in its modern, official form. ★

 Phone: 03-5379-1227 Fax: 03-3225-1813 Telex: 02322485 JUSE J

"QUALITY FUNCTION DEPLOYMENT" -THE BASICS OF QFD-

from ENGINEERS NO. 535 (MAY., 1993)

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1. An Outline of Quality Function Deployment

1.1 Quality deployment and quality function deployment in a narrow sense

In a broad sense, quality function deployment (QFD) is a generic term for quality deployment (QD) and quality function deployment in its narrow sense. QD is defined as the process of reflecting the user's needs into the quality characteristic of the product to determine the design quality of the final product. This process covers the quality of the entire product and its intrinsic parts, including its function manufacturing and development. Meanwhile, quality function deployment, in its narrow sense, is defined as carefully deploying functions or duties that determine product quality at each stage in a series of means and goals.

In general, QFD and QD are synomous. A few cases have been reported wherein the deployment of duties--quality function deployment in its narrow sense--is linked to a quality assurance chart and quality assurance activity table. By the same token, there have been no reported activities in which quality function deployment is connected with quality deployment.

1.2Quality deployment

Quality deployment involves gathering market information, recording these responses and then formulating a QD table, which provides information regarding the required quality. Developing the required quality is accomplished through two distinct methods: One way is to develop product quality from a more abstract item down to a specific item; the other is to produce a deployment table ranging from a specific level by grouping the required quality in a manner similar to that used in the "KJ method".

At present, the latter method is widely recommended.

As an alternative in determining the required quality, elements are chosen from the required quality to produce a deployment table, employing the same method used to make a required quality chart. This kind of chart is called a quality characteristic deployment table, or a quality element deployment table.

A quality element deployment table can be produced two ways. One is by assembling the elements of quality as taken from the required quality; the other involves drafting a deployment table based on quality characterstics as dictated by a company, and is independent of the required quality. Omissions of the needed quality and quality elements can be precluded by making a quality element deployment table via the latter method and working out a matrix based on the table, together with a required quality deployment table.

A matrix combining the required quality deployment table with the quality element deployment table is called a quality table in its narrow sense. What is generally called a quality table refers to this type of matrix. In addition, a table providing quality information is also called a quality table.

A matrix of this kind contains three special marks: ◎, ○ and △. Each symbol indicates the degree of correlation between the required quality and the quality elements. Arranged on the right side of the quality table is a chart known as a planned quality preparation table.

A planned quality preparation table shows the necessary quality weight-the degree of market needs for the required quality-on the basis of grades from one to five. The table also shows how each required quality is performing in the market in comparison with other firms. This comparative evaluation provides a basis for preparation of a table for planned quality, the level-up rate, sales points, the absolute weight which includes elements of the planned quality and the required quality weight.

The quality element weight can be determined by adding up the values of each quality element on the basis of the numerically processed values of ◎, △ and○, each of which correlates with the required quality weight. Following this, the quality of the design will be assessed by the findings of a report on the current values registered by a company and other corporations concerning important quality elements.

The procedure taken after determining design quality depends on the nature of a product under quality deployment. It is essential first and foremost, to define the purpose and draft a detailed plan when adopting quality deployment.

An example of this type of overall plan for the quality deployment of machines and assembly products has been presented by Yoji Akao, a professor at Tamagawa University, in an attempt to develop a comprehensive picture of technical, cost, credibility and other forms of quality deployment. His plan calls for function deployment after determining design quality, then proceeds to mechanisms aimed at materializing functions and then to deployment of units and parts.

1.3 Quality function deployment in a narrow sense

Quality function deployment aims at developing job function. It seeks to spread out as a function, the kind of quality activity necessary to secure the quality of a product that will satisfy users, a basic function of quality assurance. Activity function should be undertaken in a series of means and goals, and elements of the process should be worked into an activity function deployment table. Moreover, this process entails defining what ought to be guaranteed by the activity function, and identifying assurance items, in order to produce a quality assurance activity table.

A quality assurance activity table contains particulars concerning steps to be taken from the development of a product through to post-sales services for buyers of the product, assurance items, work necessary to bring about the assurance, the person responsible for it, and related stored documents such as basic and management documents. All details of quality assurance will be shown by arranging steps in product development and organizational sections on the table vertically and horizontally, and preparing a systematic chart showing mechanisms for quality assurance.

A table for activity function development plays a vital role in producing a quality assurance activity table, and the results of quality function deployment are incorporated into a quality assurance activity table.

2. Principles of QFD

2.1 Principles of segmentation and integration

Quality deployment entails segementation in various stages of its process. For instance, the function or performance of a product is separated from its quality, or the attainment level of its function. The quality demanded by the market is treated as the required quality, while the quality needed to convert the required quality into technological requirements is a characteristic of quality. The cost and quality of a product are to be handled separately.

The leading principle of QFD is segmentation first, and integration next; that is, dividing the process of quality function deployment, then putting together individual procedures in a deployment table.

3.2 Principles of pluralism and visualization

The next principles of QFD is to study the quality function deployment presented in a deployment table from various perspectives. A quality table provides a tool for analyzing the market and relevant technology in two different perspectives.

In terms of quality function deployment if machines and assembly products, a matrix for the necessary quality and function, or for the quality characteristic and function, will be produced to give multiple analysis concerning related issues. This includes the means used to produce the required quality, as well as whether the quality of a design can be realized using the currently available methods.

A deployment table and matrix enables the third party to gain a visual understanding of the information involved. This visual means also makes it possible for the third party to detect deficiencies in the process of quality function deployment when the market demands are defined by the table.

This pluralism and visualization is the second principle of quality function deployment.

3.3 Principles of comprehensive and partial approaches

The third principle involves comprehensive as well as partial approaches to quality function deployment. This procedure involves analysing the entirety, identifying important parts, and then studying the details of the these parts.

It is meaningless if only certain components work well when the overall process is malfunctioning, or not operating at full capacity. Similary, the entire process can malfunction when one or more of its components breaks down.

Components must work properly, and the same holds true for the entire process. Thus it becomes necessary to study quality function deployment taking a well-balanced view of the entire process as well as its individual parts. ★

"A RECOMMENDATION FOR THE WORKING-HOUR REDUCTION PROGRAM IN SMALL AND MEDIUM SIZED COMPANIES"

from ENGINEERS, No. 533 (MARCH 1993)

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1. INTRODUCTION

After analyzing how the working-hour reduction is achieved in small and medium-sized companies, we realize the procedure used is similar to Total Quality Control (TQC).

The following article describes how to proceed when implementing the Working-Hour Reduction Program by adopting the TQC concept.

2. THE PRESENT STATUS IN SMALL AND MEDIUM SIZED COMPANIES.

In order to find out how the Working-Hour Redection Program is carried out successfully, there has to be a thorough understanding of the present situation that exists in the company being surveyed. The survey data was collected from 32 companies where the Working-Hour Reduction Program has already been implemented, and the data was studied by multiple-variate analysis (principle component analysis).

The analysis revealed that five types of implementation models, as shown, are recognized in general:

a) TYPE A · · · The Top-Notch Class

These companies have 100 to 300 employees. The working-hour reduction program is steadily implemented through investing in better energy reservation equipment or hardware-oriented working-hour reduction projects.

b) TYPE B · · · Implementing as Priority Programs

These companies are rather small (less than 50 employees), and top management has committed the Working-Hour Reduction Program as priority goals, disregarding some amount of risks to be exposed and without any definite practical procedures.

c) TYPE C · · · Doing Someting for the Reduction

Such companies have less than 100 employees and emphasize human-oriented approaches, such as improvement of employees' awareness or morale, and accordingly their programs are rather advanced.

d) TYPE D · · · Transition Stage to Reach TYPE B or C

These companies have the same number of employees as Type C, and mostly implement five days/week practices, two times per month. The concepts are recognized, but physical implementation is not followed.

e) TYPE E · · · Transition stage to Reach Type D

Such companies also have the same number of employees as Type C but possess a passive attitude, and accordingly their status is low.

Prior to initiation of the Working-Hour Reduction concept, it is recommended the companies identify which type they are in and then commit and direct employees for successful implementation.

3. Analysis for Common Factors for Success

While analyzing the status of each company, it is observed there are many kinds of factors leading to success and failure within Types A, B, and C, and also some sorts of commonality for success which are identified as mandatory requirements. These are:

a) To issue a firm commitment for implementation of a Working-Hour Reduction Program and to persuade employees to change from old tactics to breakthrough new concepts.

It is necessary for top management to issue its own commitment for the Working-Hour Reduction

Program with an active, firm resolution and to have every employee participate and become fully involved.

b) To follow the TQC procedure (plan–do–check–act–cyclic action) for the Working-Hour Reduction Program.

It is necessary that a promotion schedule to be established and that all employees be required to participate in the program, and become more creative, in order to improve and change the quality of their work.

c) To improve and reinforce a company's structure.

It is necessary for a company's structure to be changed to a stronger and more durable one to better prepare for the future, using the Working–Hour Reduction Program as a trigger to expedite these changes.

It is easily recognized that the above mentioned factors have the same objectives which the TQC concept is aiming for, and also, quite similar processes to TQC procedures. After identifying these similarities it becomes clear that the active approach for the Working–Hour Reduction Program is better implemented with the TQC method for quick results and firm establishment of strong company structure.

4. Recommendation of TQC Method for the Working–Hour Reduction Program.

The Working–Hour Reduction Program based on the TQC method is, in short, an overall reduction program carried out by the Management by Policy method. On the other hand, detailed implementation of the program is supported by the QC Circle method. This is explained in Tables 1 and 2 attached.

The TQC concept contributes not only to customer satisfaction, but also accomplishes the Working-Hour Reduction Program at the same time, as follows:

a) To focus employees' energy in the same directions which are specified as high priority objectives by top management.

b) To clearly establish and define goals and schedules, and always monitor their status under "plan–do–check–act" cyclic action.

c) To have all employees participate in the program, to improve communication among them, and to foster a free–speaking environment.

d) To respect each employee as a human being, and to recognize his or her creativity, which will lead to improve morale.

e) To have each employee recognize the importance of appreciating a full understanding of operational procedures and facts observed.

5. Case Study for TQC Concept Implementation

a) Company A, engaged in various security systems production, with 14 employees, and sales turnover of approximately ¥300 million. Company A implemented the following steps as TQC methods.

STEP 1. **Commitment of the Working-Hour Reduction Program by Top** Management and Establishment of a Steering Committee. The decision by top management to quickly implement the five days per week operational system was announced to each employee. All employees were also reminded of their responsibilities for improvement and change of working morale and procedures. Every employee became a member of the steering committee, and a meeting of the committee was scheduled to be held once a month.

STEP 2. **Identification of the Present Status.** The data collected revealed average weekly working hours of 41.1 to 48.8 hours and annual holidays of 84 days (Holidays are Sundays, national holidays and one Saturday each month.). The problem was that engineering personnel typically engage in an average of two hours of overtime each day.

STEP 3. **Scheduling and Establishment of Goals.** The program was separated into two phases: The first phase was to achieve 42.3 hrs/week by the end of September 1991, and the second was to reach 39 hrs/week and a full five days/week by the end of April 1992.

STEP 4. **Prediction of Probable Problems.** After defining the schedule and goal, the committee discussed anticipated problems, such as: Would, customers accept our procedure change, what to do in an emergency, how to handle heavy workloads, and how to deal with pay decreases caused by overtime reduction. These were concerns of nearly every committee member.

STEP 5. Establishment of Counter-Measures.
After identifying possible problems, corrective counter–measures were constructively discussed and presented, such as:

a. Design time could be reduced by using 16 bit to 32 bit for PC utilization, proposed by engineering.
b. Sales people can concentrate on more added–value work, by utilizing subcontractors more effectively.
c. Hardware concerns:
(1) Installation of CAD system.
(2) Installation of more word–processors for better production control.
(3) Improvement of raw meterial distribution procedures.
d. Software concerns:
(1) Establishment of standard operating procedures.
(2) Improvement of part-timers' wage system.
e. General affairs concerns:
(1) Establishment of a compensatory holiday system for personnel working overtime.
(2) Distribution of the company's holiday calendar to suppliers.
(3) Preparation of an emergency telephone number table.

STEP 6. Evaluation of Counter–Measures Established.
All counter–measures were evaluated by the steering committee members for their effectiveness and were approved for implementation. Examples of some counter–measures are:

a. Contribution to sales capability augmentation.
b. Contribution to upgrading employees morale.
c. Contribution to the campaign to recruit new employees.

The above mentioned counter–measures, their goals, expected merits and demerits, and problems anticipated were presented to all employees on a color slide briefing, under the title of TQC Status Boards for Working–Hour Reduction; See Table 2, attached.

STEP 7 Implementation of the Counter-Measures Established.
The counter–measures established were implemented in two phases depending on their importance.

STEP 8. Verfication by the Steering Committee.
The monthly steering committee monitored and evaluated progress based on the TQC Status board (see table 2) which described the goals and schedules to be accomplished under Plan–Do–Check–Act cycling concept. During implementation of the above procedures, it became clear that reporting of data was deliberately changed to comply with the TQC concept and QC methods; and this in–turn caused a similar chage in employees' tactics and daily work routine,

Company A is successfully accomplishing its goals by following the Plan-Do-Check-Act cyclic action through Phases 1 and 2 of Step 3, to date. Accordingly, its sales turn-over is steadily increasing and 1992 sales were expected to be ¥430 million. The ratio for supplier reliance increased from 10% to 60%, this means in actuality that company A has been structurally reborn, since sales capacity has been strengthened by all employees particiation.

The size of the workforce and length of the workweek were also measurably improved by the implementation of the counter–measures described above. At the begining of the program, it was not considered possible to hire any additional personnel or to reduce the length of the workweek. However, after the counter–measures contained in the Working-Hour Reduction Program were carried out, five new employees were hired and every employee is now fully enjoying a five-day workweek and engaging in a much higher value added work assignment. This has also contributed to the build–up of an enthusiastic working environment for all the companys employees. ★

Table 1 TQC Implementation Sequence for working-Hour Reduction Program

STEP 1.
Commit for implementation of working-hour reduction program, and establish the steering committee

STEP 2.
Identify the present status

STEP 3.
Establish goals to be achieved, and schedules to be followed.

STEP 4.
Predict probable problems for implementation.

STEP 5.
Establish counter-measures for anticipated problems

STEP 6.
Predict effectiveness for counter-measures established

STEP 7.
Implement counter-measures

STEP 8.
Follow-up by steering committee

Table 2 TQC Status Boards for Working-Hour Reduction

STEP / ITEM	Present Status	STEP 1	STEP 2	----------------------	STEP 8
Phase Identification					
Goal for Average Working Hour / Week					
Predictable Problems					
ACTION: For Hardware Productivity					
ACTION: For Software Productivity					
ACTION: Counter-Measure for Demerits					
ACTION: Counter-Measure for Suppliers					
Expecting Effectiveness					

This board will be used at the meeting to discuss for actions to be taken and to originate members creative ideas or opinions for implementation.

JUSE 8TH INTERNATIONAL SEMINAR ON TQC FOR TOP MANAGEMENT -ENGLISH COURSE-

Date: October 4 to 14, 1993
Venue: JUSE Higashi-Koenji Annex
Accommodation: Tokyo Hilton International etc. (first class hotels)

All the subjects concerned TQC/TQM includes New Methods such as QFD, and N7, ISO 9000, Case Study on Deming Prize winning companies are also discussed, by prominent lectures and company directors in change of TQC, with simultaneous interpretation English/Japanese.

Fee:

Accommodation	Single	Double
Fee (per person)	¥794,000	¥674,000

The fee includes 12 nights accommodations from October 3 to 14 with breakfasts, Seminar fee with lunches, Plant tour fee with lunches, and sightseeing fee without lunch.

THE 7TH AQCS (ASIA QUALITY CONTROL SYMPOSIUM) - TOKYO OCTOBER 15 & 16, 1993

The Role of Asia for the Quality Development in the World

Venue: MUSASHI INSTITUTE OF TECHNOLOGY
Tamatsutsumi 1-28-1
Setagaya, Tokyo

Organized by JSQC (Japanese Society for Quality Control), CSQC (Chinese Society for Quality Control) and KSQC (Korean Society for Quality Control).

PROGRAM

PLANT VISIT: October 15 (Friday), 9:20-16:30
NKK, Ogishima Works (Steel Mills)
Sogo, Yokohama (POS in Department Store)
Fee: ¥7,500

WELCOME: RECEPTION October 15 (Friday), 17:00-18:00
JUSE Higashi-Koenji Annex

SYMPOSIUM: October 16 (Saturday), 9:50-17:20
Musashi Institute of Technology
Fee: ¥9,500

RECEPTION: October 16 (Saturday), 17:40-19:00
Musashi Institute of Technology

For more information or inquiries, please contact:
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