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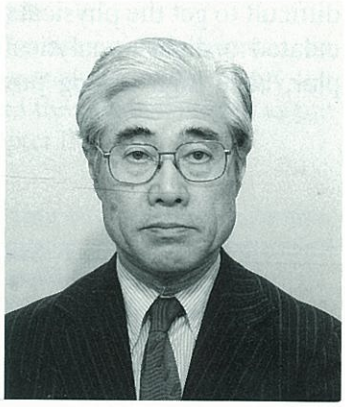
STATISTICAL METHODS IN JAPANESE QUALITY CONTROL

by Dr. Ikuro KUSABA, Professor, Musashi Institute of Technology

Quality control was first introduced to Japan in 1949 from the U.S.A. The first statistical methods to be introduced were the control chart and the sampling inspection, followed by statistical test, analysis of variance, correlation analysis, and design of experience. At the same time, quality control started to be used as tools of management. Later, two groups of people studied the statistical methods. The first group was the statisticians and the mathematicians. Their works were rather theoretical, and not necessarily related to quality control. The other group consisted of university professors who were not directly concerned with statistics, and people in the engineering profession who were not specialists in statistics, such as mechanical engineers, chemical engineers, and electronic engineers within corporate enterprises. The Subject of their studies was how to utilize statistics in quality control.

JUSE has held numerous seminars on quality control. Of these, courses which principally aim at education on statistical methods for quality control include: Quality Control Basic Course, Quality Control Introductory Course, and Design of Experiment Course. The instructors in charge of the courses were not specialists in statistics, but those who belonged to the second group as mentioned above. This helped make statistical methods easier to be understood by the corporate students.



The QC seminars arranged by JUSE also include courses designed for the employers, division/section chiefs, foremen, and business department staff respectively. While they are not particularly aimed at the teaching of statistical methods, their curriculums do include explanations on how to write and use such basic methods as the histogram and the Pareto diagram. This type of training has been effective for making people in all ranks and all sections of corporate entities understand the necessity for judgement based on facts, through data.

Thanks to such educational methods, the statistical approaches penetrated corporate quality control while, at the same time, securing strong ties with the specific technologies. For instance, in calculating a standard deviation, people now consider whether its physical meaning is process variation or measurement variation: when the result of a statistical test is "significant," they consider what its explanation should be in terms of specific technology. In this way, statistical methods permeated Japanese quality control. Table 1 shows the methods used in presentations at the QC Annual Conferences for staff members and division/section chiefs, held in Japan each year in May and November. Table 2 is a list of meth-

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ods used in the case studies which appeared in "FQC" (renamed "QC Circle" since 1988), a periodical for foremen and workers in the production line.

On Table 1, we can see that the use of Multivariate Analysis has been increasing since around 1977. As regards the so-called Taguchi method, the basic usage of the orthogonal array has been widely adopted since the 1950's as a type of the design-of-experiment method. By contrast, its complicated usages represented by the pseudo-factor method, and the concepts of SN-ratio and on-line QC are the choice of only a small number of people. The reasons are; 1. In spite of their originality, these methods have not been provided with sufficient logical explanation; 2. The usage of the methods requires special skills; 3. SN-ratio is effective in solving a limited range of problems, but the use of logarithms makes it difficult to get the physical meaning of the errors calculated ordinary analytical techniques are far simpler, have high testing power, and are effective enough as well as convenient.

It can be seen from Table 2 that the use of techniques such as the system diagram and correlation diagram has been increasing recently. These are some of the approaches called "the new seven tools" as against the conventional and fundamental "seven tools of QC." They are not methods for gathering facts in the form of data and arranging them in a convenient order, but ways of coordinating opinions. Therefore, it must be stressed that one should be careful not to mistake the results of such opinion coordination as facts.

As shown on the two tables, the characteristics of quality control in Japan is that not only statistical methods but also methods used in OR, IE, VE and reliability engineering are extensively and generally utilized with successful results. Moreover, basic researches in such areas as quantification, sensory test, and non-parametric method are also quite active. ★

Table 1 Statistical Methods used in Presentation of QC Annual Conference

year	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
(Fundamental)																					
graph	29	16	19	18	19	15	26	36	26	20	40	40	44	59	70	88	55	78			
cause & effect diagram	28	16	15	18	19	16	23	36	30	35	30	35	42	56	57	49	52	39			
Pareto chart	6	7	10	9	12	2	10	22	17	21	18	20	23	33	36	34	34	40			
histogram	5	—	2	5	4	5	16	12	14	15	11	17	22	28	25	37	33	36			
control chart	7	4	1	8	5	5	8	12	8	15	11	20	23	26	21	23	20	13			
scatter diagram	3	—	—	7	—	3	4	12	15	13	6	6	2	13	13	15	24	22			
process capability	—	—	—	—	—	1	—	—	2	—	1	1	4	1	2	7	—	3			
nomogram	—	—	—	—	1	2	4	—	—	—	—	—	—	—	1	—	—	—			
(General)																					
design of experiment	18	8	14	13	15	14	14	27	12	14	27	29	44	36	59	49	45	43			
correlation & regression	10	5	—	9	4	3	13	6	9	9	10	11	16	17	10	20	18	18			
analysis of variance	2	3	—	3	1	1	—	2	9	4	4	6	2	5	4	7	5	10			
statistical test & estimation	1	1	—	—	3	3	6	3	6	2	1	5	1	1	1	3	3	9			
optimization & EVOP	1	—	1	—	—	—	1	—	—	—	1	—	1	1	1	—	1	—			
time series	—	—	—	—	1	2	—	—	—	—	1	—	2	1	1	2	—	1			
cumulative method	—	—	—	1	—	1	1	—	—	—	—	—	2	—	1	1	—	—			
sampling inspection	—	—	—	—	—	—	—	—	—	—	2	2	1	1	1	—	—	—			
Multivariate Analysis)																					
multiple regression	3	2	3	3	5	2	4	3	5	12	4	5	17	12	14	23	13	8			
principal component analysis	—	—	—	1	1	—	1	6	1	6	6	3	4	7	8	7	4	2			
discriminant & cluster analysis	—	—	—	—	1	2	—	1	—	2	2	1	1	4	11	3	4	2			
quantification theoly	—	—	—	—	—	—	—	—	—	—	—	—	4	5	2	7	8	2			
others	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—			
(Miscellaneous)																					
tree analysis & QFD*	—	—	1	—	—	1	3	—	6	6	30	29	42	18	14	43	32	40			
FTA														11	8	14	10	18			
FMEA	—	—	—	—	—	2	1	—	6	5	3	10	—	11	12	9	4	4			
Weibull distribution	3	—	1	—	1	3	—	2	4	3	2	1	1	4	3	7	2	3			
distribution theory	3	5	1	4	5	3	5	7	1	4	—	2	5	3	5	3	1	—			
sensory test	—	—	4	2	1	4	2	4	—	—	2	—	2	3	1	5	3	—			
relation chart	—	—	—	—	—	—	—	—	4	4	5	7	6	5	4	15	7	6			
PERT	—	—	—	—	—	—	—	—	2	2	4	2	1	1	1	3	2	—			
simulation	1	1	1	3	—	—	—	—	2	1	3	—	1	3	1	2	—	3			
computer technic & EDPS	—	—	—	—	—	—	—	—	—	—	—	—	—	2	6	6	1	10			
others	5	1	1	4	2	1	1	—	2	4	2	1	2	4	—	12	6	9			
No. of presentation	126	60	65	94	110	97	95	114	107	130	138	148	178	172	202	210	183	175			

* QFD: quality function deproyment chart

Table 2 Statistical Methods used in Experience Reports in FQC Magazine

year	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
graph	24	31	26	26	25	31	31	32	34	42	37	44	42			
cause & effect diagram	19	23	25	24	27	28	31	28	32	39	26	36	37			
Pareto chart	17	24	18	25	33	24	30	24	32	31	31	36	37			
stratification	5	1	9	12	6	4	9	7	12	19	15	10	2			
histogram	8	4	4	6	8	8	11	7	16	15	14	17	11			
check sheet	6	5	10	8	3	2	6	6	10	10	6	15	8			
control chart	8	—	3	5	5	4	3	4	4	4	3	5	2			
scatter diagram	5	3	1	6	4	2	7	2	7	2	6	11	10			
statistical test & estimation	6	—	2	1	2	—	—	1	2	1	1	1	—			
design of experiment	1	—	—	1	—	2	1	1	—	—	1	—	—			
sampling inspection	1	—	1	1	—	—	—	—	—	—	—	—	—			
motion analysis	3	2	5	3	4	1	5	2	1	1	2	4	—			
time study (MTM, WF)	2	—	1	4	3	—	1	—	1	1	1	—	2			
process anaylysis	1	1	1	5	3	1	—	2	2	3	2	5	2			
work sampling	—	—	—	—	—	2	1	—	—	—	—	—	—			
VE	—	—	—	—	3	—	—	1	1	—	—	—	—			
affinity diagram	1	1	1	—	—	—	1	—	—	—	—	—	—			
system diagram	—	—	—	—	—	—	—	1	7	9	11	20	22			
correlation diagram	—	—	—	—	—	1	—	4	3	3	9	3	15			
radar chart	—	—	—	—	1	—	—	—	—	5	3	6	4			
FTA	—	—	—	—	—	—	—	1	1	—	—	1	1			
arrow diagram	—	—	—	—	—	—	—	—	—	1	1	1	1			
binary diagram	—	—	—	—	—	—	—	—	1	—	3	7	6			
others	2	2	1	—	1	3	2	6	3	2	4	7	2			
No. of presentations	39	37	32	37	40	41	42	35	40	45	38	46	44			

ENGLISH PUBLICATIONS ON QUALITY CONTROL AVAILABLE FROM JUSE

BOOKS

1. WHAT IS TOTAL QUALITY CONTROL? — The Japanese Way
   by Kaoru Ishikawa, 1985, 215 Pages, 6,500 yen
   Publisher: Original by JUSE, English V. by Prentice Hall (USA)
   Price with Mail Charge: 10,100 yen (Air), 9,300 yen (Sea)
2. TOTAL QUALITY CONTROL FOR MANAGEMENT
   by Masao Nemoto, 1987, 238 Pages, 6,500 yen
   Publisher: Original by JUSE, English V. by Prentice Hall (USA)
   Price with Mail Charge: 10,400 yen (Air), 9,300 yen (Sea)
3. COMPANY-WIDE TOTAL QUALITY CONTROL
   by Shigeru Mizuno, 1988, 313 Pages, 2,240 yen
   Publisher: Original by JUSE, English V. by Asian Productivity Organization (APO) (JAPAN)
   Price with Mail Charge: 6,100 yen (Air), 5,100 yen (Sea)
4. QC CIRCLE KORYO — General Principles of the QC Circle
   by QC Circle Headquarters, JUSE, 1980, 86 Pages, 2,000 yen
   Publisher: Original and English V. by JUSE
   Price with Mail Charge: 4,500 yen (Air), 4,300 yen (Sea)
5. HOW TO OPERATE QC CIRCLE ACTIVITIES
   by QC Circle Headquarters, JUSE, 1985, 254 Pages, 3,000 yen
   Publisher: Original and English V. by JUSE
   Price with Mail Charge: 5,900 yen (Air), 5,500 yen (Sea)
6. GUIDE TO QUALITY CONTROL
   by Kaoru Ishikawa, 1976, 226 Pages, 2,100 yen
   Publisher: Original by JUSE, English V. by APO
   Price with Mail Charge: 5,200 yen (Air), 4,600 yen (Sea)
7. QUALITY CONTROL CIRCLES AT WORK
   by Kaoru Ishikawa, 1984, 232 Pages, 2,100 yen
   Publisher: Original by JUSE, English V. by APO
   Price with Mail Charge: 5,900 yen (Air), 5,500 yen (Sea)
8. STATISTICAL METHODS FOR QUALITY IMPROVEMENT
   by Hitoshi Kume, 1985, 245 Pages, 2,800 yen
   Publisher: Original and English V. by Assoc. of Oversea Technical Scholarship (AOTS) (JAPAN)
   Price with Mail Charge: 5,800 yen (Air), 5,300 yen (Sea)

PERIODICALS

1. REPORTS OF STATISTICAL APPLICATION RESEARCH, JUSE
   English, Quarterly, by JUSE. Annual Subsc. 6,000 yen
   Annual Rate with Mail Charge: 8,700 yen (Air), 7,300 yen (Sea)
2. ENGINEERS (JUSE Official Journal)
   Japanese, Monthly by JUSE. Ann. Subsc. 4,500 yen
   Annual Rate with Mail Charge: 10,600 yen (Air), 8,100 yen (Sea)
3. HINSHITSU KANRI (Total Quality Control)
   Japanese, Monthly, by JUSE. Ann. Subsc. 9,600 yen
   Annual Rate with Mail Charge: 18,100 yen (Air), 13,200 yen (Sea)
4. QC CIRCLE (renamed from FQC since 1988)
   Japanese, Monthly, by JUSE. Ann. Subsc. 3,300 yen
   Annual Rate with Mail Charge: 10,000 yen (Air), 6,900 yen (Sea)

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THE HISTORY OF THE DEMING PRIZE

by Dr. Shoichi SHIMIZU, Dean, School of Agricultural Science
Nagoya University

The establishment of the Deming Prize

Professor W. E. Deming came to Japan in July 1950 at the invitation of the Union of Japanese Scientists and Engineers (JUSE). He contributed greatly to the dawning of quality control in Japan, through activities including the "Quality Control Seminar 8-day Course." Moreover, Professor Deming donated the royalties on the textbooks which were used at the Seminar for the development of Japaneses quality control.

In commemoration of such contributions and friendship of Professor Deming, the Deming Prize was founded in the following year, on the suggestion of JUSE, which proposed a prize to be awarded to the individuals who have made outstanding contributions to the study and popularization of "Statistical Quality Control (SQC)," emphasized by the Professor, and to the enterprises which have shown remarkable improvement in business through the practicing of Statistical Quality Control. The first Deming Prize (1951) was awarded to Professor Motosaburo Masuyama, a pioneer in the study of statistics in the nation, and to four manufacturing enterprizes.

The history of the Deming Prize

As stated above, the Deming Prize was originally composed as prize for individuals and that for corporate enterprises. Later, the former came to be called the Deming Prize for Individual Person, and the latter, the Deming Application Prize. Further, the Prize for Small Enterprise and the Prize for Division were added within the Application Prize, in 1958 and 1966 respectively. Apart from this, the Quality Control Award for Factory was established in 1976.

Originally, criterion for selection of the Application Prize was whether one had attained good results from efficient utilization of statistical approaches in the manufacturing process, therefore, emphasis was laid on the screening of papers rather than the on-site inspection. But since around 1956, the on-site inspection became the primary criterion, and the current Schedule A/Schedule B system (*Note) was adopted. In the meantime, the check list was also improved.

The most remarkable change is probably that, since about 1960, the examination was done not only of the application of etatistical approaches in the manufacturing process, but also of activities of the company in a braoder sense. Thus, according to the 1961 "Deming Prize Guide," the definition of new quality control is "to develop, design, produce, sell, and serve the most economic and most useful products, which can also provide customer satisfaction. In order to achieve such aim, all divisions of the whole company are required to form an organization which makes cooperation easier, and to fully utilize various methods including the statistical approaches. (The Deming Prize Committee, 1961)"

Moreover, after 1971, new quality control was defined as follows: "To achieve corporate aim through rational repetition of Planning, Acting, Evaluating, and Taking Measures. To do this, all members of the enterprise must be able to understand and practive the statistical philosophy and approach. This includes designing, producing, and supplying products and services having the quality required by the customers, under the consumer-oriented principle, with consideration to the general welfare of the public, and at an economic level. In order to guarantee such quality, a series of activities including surveys, research, development, design, purchase, production, inspection, and sales, as well as related activities within and outside of the company are also required."

Since 1987, the new type of quality control was called "the company-wide quality control based on statistical quality control," or "Company-Wide Quality Control" for short. Changes were made in the Deming Prize so that the Deming Application Prize came to be awarded to the enterprizes (including small and medium-sized enterprises) or devisions thereof, which achieved remarkable results by practicing the "Company-Wide Quality Control." Also, since 1984, a new system has also allowed for foreign enterprises to apply for the Prize, to be examined and awarded the Prize.

***Note:**

On-site inspection consists of three parts, Schedule A, Schedule B and interviews with the CEO.

1. During the time called Schedule A, the people of the company take the initiative in explaining the status of their quality control to the inspection team. The time is determined upon prior consultation between the company and the chief examiner.
2. During the time called Schedule B, the inspection team takes the initiative in making the survey. Therefore, the judges prepare a draft for the examination schedule which, in principle, is submitted to the company after the completion of the Schedule A examination. The schedule is determined upon agreement of the company side.

(excerpts from the Deming Prize Guide)

Effects on quality control in Japan

As stated above, the changing of the subject of the Deming Application Prize, from "Statistical Quality Control" to "Company-Wide Quality Control," has close relations with the situation of quality control practices in the Japanese enterprises.

Quality control in Japan, since its introduction soon after the war, had been applied exclusively to the manufacturing industries, and mainly in their production processes. Gradually, people recognized that it was insufficient to have it only in the production processes, and so it was expanded into Company-Wide Quality Control (CWQC), which is participated by all divisions. Moreover, the definition of quality was broadened to include cost, quantity, and delivery term, which make up Total Quality. In addition to the quality of the products, the quality of services were also attached more importance. According to the latest ways of thinking, the quality of work, people, and even the quality of company management should also be included as subjects of quality control in order to achieve such total quality. At the same time, quality control spread from the general manufacturing industries to companies in the construction, services, and sales sectors. Further, some of the public utilities such as electricity and gas companies, as well as some government offices are also taking up quality control. Now, Total Quality Control (TQC) is regarded to be synonymous with Company-Wide Quality Control (CWQC), according to the JIS definition.

Recently, the enterprises which won the Deming Prize when SQC was prevalent are challenging it again. This illustrates their keen realization of the importance of TQC.

★

Number of Winner Companies of Deming Prize and Japan QC Medal

	Large Enterprise	Small Enterprise	Division	Factory	Japan QC Medal	Total
1951	4					4
52	6					6
53	4					4
54	3					3
55	3					3
56	4					4
57	—	—				—
58	4	1				5
59						
60	3	1				4
61	2	1				3
62	1	—				1
63	1	—				1
64	1	—				1
65	1	—	—			1
66	1	—	1			2
67	1	1	—			2
68	2	1	—			3
69	—	1	—			1
70	1	—	—		1	2
71	1	—	—		—	1
72	1	1	—	—	—	2
73	—	2	—	1	1	4
74	—	2	—	—	—	2
75	1	3	—	1	1	6
76	2	1	1	2	—	6
77	1	—	—	1	1	3
78	1	1	—	—	—	2
79	4	1	—	1	—	6
80	4	1	—	1	1	7
81	—	2	1	1	1	5
82	4	2	—	—	1	7
83	2	1	—	1	—	4
84	3	2	—	—	—	5
85	4	3	1	—	1	9
86	2	2	—	—	—	4
87	4	—	—	—	—	4
TOTAL	76	30	4	9	8	127

(Continued from Page 7)

5. Announcement of the Prize Winner

The prize winner is announced in newspapers, such as "Nippon Keizai Shinbun" (Japan Economic Journal) and also is reported in "Japan Economic Journal Weekly" (English), the monthly magazine "Statistical Quality Control" and the JUSE organ "ENGINEERS." At the same time, the reason for the award is revealed to the public. If the applicant is not considered acceptable, the application is treated as pending and the company name is not announced.

6. Awarding Ceremony, and Reporting and Lecture Meeting

The awarding ceremony and reporting and lecture meeting by the winner take place in November every year. The representative of the winner is required to give a briefing and lecture in relation to the prize-winning.

Note: When applying for the Deming Application Prize and receiving the onsite inspection after having approval of the submitted documents, please refer to the Section "Remarks on Undergoing the Examination (International)" toward the end of this booklet.

DEMING APPLICATION PRIZE WINNERS

Deming Application Prize
[S] Deming Application Prize for Small Enterprise
[D] Deming Application Prize for Division

* Company's names are those in the awarded time

1951 Fuji Iron & Steel Co., Ltd.
Showa Denko K. K.
Tanabe Seiyaku Co., Ltd.
Yawata Iron & Steel Co., Ltd.
1952 Asahi Chemical Co., Ltd.
Furukawa Electric Co., Ltd.
Nippon Electric Co., Ltd.
Shionogi & Co., Ltd.
Takeda Chemical Industries, Ltd.
Toyo Spinning Co., Ltd.
Kyushu Cloth Industry Co., Ltd.
1953 Kawasaki Steel Corporation
Shin-etsu Chemical Industry Co., Ltd.
Sumitomo Metal Mining Co., Ltd.
Tokyo Shibaura Electric Co., Ltd.
1954 Nippon Soda Co., Ltd.
Toyo Bearing Manufacturing Co., Ltd.
Toyo Rayon Co., Ltd.
1955 Asahi Glass Co., Ltd.
Hitachi Ltd.
Honshu Paper Manufacturing Co., Ltd.
1956 Fuji Photo Film Co., Ltd.
Konishiroku Photo Industry Co., Ltd.
Mitsubishi Electronic Corp.
Tohoku Industry Co., Ltd.
1957 (None)
1958 Kanegafuchi Chemical Industry Co., Ltd.
Kureha Chemical Industry Co., Ltd.
Matsushita Electronic Corp.
Nippon Kokan K. K.
[S] Nakayo Communication Equipment Co., Ltd.
1959—1960
Asahi Special Glass Co., Ltd.
Kurake Spinning Co., Ltd.
Nissan Motor Co., Ltd.
[S] Towa Industry Co., Ltd.
1961 Nippondenso Co., Ltd.
Teijin Ltd.
[S] Nihon Radiator Co., Ltd.
1962 Sumitomo Electric Industries, Ltd.
1963 Nippon Kayaku Co., Ltd.
1964 Komatsu Manufacturing Co., Ltd.
1965 Toyota Motor Co., Ltd.
1966 Kanto Auto Works, Ltd.
[D] Matsushita Electric Industries Co., Ltd.
Electric Components Division
1967 Shinko Wire Co., Ltd.
[S] Kojima Press Industry Co., Ltd.
1968 Bridgestone Tire Co., Ltd.
Yanmer Diesel Engine Co., Ltd.
[S] Chugoku Kayaku Co., Ltd.
1969 [S] Shimpo Industry Co., Ltd.
1970 Toyota Auto Body Co., Ltd.
1971 Hino Motors, Ltd.
1972 Aisin Seiki Co., Ltd.
[S] Saitama Chuzo Kogyo K. K.
1973 [S] Sanwa Seiki Manufacturing Co., Ltd.
[S] Saitama Kiki Manufacturing Co., Ltd.
1974 [S] Horikiri Spring Manufacturing Co., Ltd.
[S] Kyodo Surveying Co., Ltd.
1975 Richo Co., Ltd.
[S] K. K. Takebe Tekkosho
[S] Tokai Chemical Industries, Ltd.
[S] Riken Forge Co., Ltd.
1976 Sankyo Seiki Manufacturing Co., Ltd.
Pentel Co., Ltd.
[S] Komatsu Zoki, Ltd.
[D] Ishikawajima-Harima Heavy Industries Co., Ltd., Aero-Engine & Space Operations
1977 Āisin-Warner Ltd.
1978 Tokai Rika Co., Ltd,
[S] Chuetsu Metal Works Co., Ltd.
1979 Nippon Electric Kyushu, Ltd.
Sekisui Chemical Co., Ltd.
Takenaka Komuten Co., Ltd.
Tohoku Ricoh Co., Ltd.
[S] Hamakako Denso Co., Ltd.
1980 Fuji Xerox Co., Ltd.
Kayaba Industry Co., Ltd.
Komatsu Forklift Co., Ltd.
The Takaoka Industrial Co., Ltd.
[S] Kyowa Industrials Co., Ltd.
1981 [S] Aiphone Co., Ltd.
[S] Kyosan Denki Co., Ltd.
[D] Tokyo Juki Industrial Co., Ltd.
Industrial Sewing Machine Division
1982 Kajima Corporation
Nippon Electric Yamagata Ltd.
Rhythm Watch Co., Ltd.
Yokogawa-Hewlett Packard Co., Ltd.
[S] Aisin Chemical Co., Ltd.
[S] Shinwa Industries Ltd.
1983 Shimizu Construction Co., Ltd.
The Japan Steel Works., Ltd.
[S] Aisin Keikinzoku Co., Ltd.
1984 Komatsu Zenoah Co., Ltd.
The Kansai Electric Power Co., Inc.
Yaskawa Electric Manufacturing Co., Ltd.
[S] Anjo Denki Co., Ltd.
[S] Hokuriku Kogyo Co., Ltd.
1985 Toyoda Machine Works, Ltd.
Toyoda Gosei Co., Ltd.
Nippon Carbon Co., Ltd.
Nippon Zeon Co., Ltd.
[S] Uchino Komuten Co., Ltd.
[S] Comany Co., Ltd.
[S] Hoyo Seiki Co., Ltd.
[D] Texas Instruments Japan Limited,
Bipolar Department
1986 Toyoda Automatic Loom Works, Ltd.
Hazama-gumi, Ltd.
[S] Sanyo Electric Works, Ltd.
[S] Nitto Construction Co., Ltd.
1987 Aisin Chemical Co., Ltd.
Daihen Corporation
NEC IC Microcomputer Systems Ltd.

AWARDED COMPANIES OF QUALITY CONTROL AWARD FOR FACTORY BY DEMING PRIZE COMMITTEE

1973 Mitsubishi Heavy Industries Co., Ltd.
Kobe Shipyard
1975 Sekisui Chemical Co., Ltd.
Tokyo Plant
1976 Kubota Iron & Machinery Works, Ltd.
Engine Tech-Research Department
Kubota Iron & Machinery Works, Ltd.
Sakai Works
1977 Japan Aircraft manufacturing Co., Ltd.
Atsugi Works
1979 The Japan Steel Works, Ltd.
Hiroshima Plant
1980 Kobayashi Kose Co., Ltd.
Manufacturing Division
1981 Matsushita Electric Works, Ltd.
Hikone Factory
1983 Fuji Electric Co., Ltd.
Matsumoto Plant

THE DEMING PRIZE GUIDE –FOR OVERSEA COMPANIES–

FROM APPLICATION TO THE WINNING OF THE PRIZE

(Excerpts from Chapter II)

1. Preface

Quality Control is a system of activities to ensure the quality of products and services, in which products and services of the quality required by customers are produced and delivered economically. Quality assurance is carried out not only through the in-process or shipping inspection, but through the precise knowledge of the quality required by the customer so that new products may be planned and designed in conformity with the required quality, and manufactured in the production process in conformity with the design quality. Consequently, the responsibilities for acceptable quality, including reliability, are taken not only by those directly in charge of the product quality but by all other departments within the company as well as the management.

In addition to assured quality of products and services, CWQC demands comprehensive control of cost, productivity, delivery, safety, environmental protection, and any other activities pertaining either directly or indirectly to quality of performance. For this, from top to bottom in a company, each person in each department including research, development, production, materials, engineering and sales must be quality-minded and aware of the statistical approach for the exercise of control in order to be able to cooperative systematically in the implementation of quality control for maximal efficiency as an operational whole. One example of such cooperative contribution to companywide excellence in quality is the QC Circle activities which have won wide and successful acceptance in Japan.

In view of the fact that the purpose of the Deming Prize is to award prizes to those companies which are recognized as having successfully applied CWQC based on statistical quality control and which are likely to keep up with it in the future.

2. Eligibility for the Award

The Deming Application Prize is an annual award presented to a company or a division which is recognized as having had successful results from the implementation of CWQC based on statistical quality control.

3. Application Procedure

3-1. Submission of Application Form

An applying company or division must submit an application form (See Page 27) to the Deming Prize Committee after filling in the required items. The closing day is November 20 of the year preceding the year in which examination is conducted.

On receipt of the application form, a preliminary deliberation is held as to its acceptability, and the applicant is notified of the result not later than December 20.

Prospective applicants are advised to hold preliminary consultations with the secretariat of the Deming Prize Committee before completing and submitting application.

3-2. Submission of the Description of QC Practices

On receipt of acceptance notification, the applicant is required to submit a Description of QC Practices and a company business prospectus, both written in Japanese, not later than January 20 of the year in which examination is conducted. If necessary, the English version of these documents may be appended.

The Description of QC Practices should present in concise and concrete terms the actual state of the quality control currently practiced, and the instructions are as prescribed in Section 2 of Chapter III.

3-3. Examination Costs

Expenses entailed in carring out the on-site examination by the committee will consist of the following examination fee and incidental expenses:

1) Per diem compensation for each examiner
2) Travel expenses for each examiner
3) Hotel and meal expenses for each examiner
4) Cost of preparing a written opinion
5) Interpreter/Translater fees
6) Other costs: Registration fee, correspondence charges etc.

Notes:
1. For further detail of costs, please contact the secretariat of the Deming Prize Committee.
2. The number of persons forming the examination team will be decided upon by the Application Prize Sub-Committee on the basis of the business size of the applicant, the number of sites to be examined, and other requirements.
3. Expense estimates are liable to change without notice due to fluctuations in prices and currency exchange rates.

4. Examination and Selection of Winner and Awarding

Examination is conducted by the Application Prize Sub-Committee, beginning with a review of the contents of the "Description of QC Practices." If the Description of QC Practices is approved, the applicant is subjected to on-site examination. If the applicant passes the on-site examination, the Deming Prize Committee decides to award a prize to the applicant, and the winner receives the Deming Medal with an accompanying certificate of merit.

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JUSE INTERNATIONAL SEMINAR ON TQC

(Company-wide Quality Control)

from October 17 **to** 26, 1988 (8 days except weekend)
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For detailed information please contact:

International TQC Seminar Secretary in
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Address: 5-10-11 Sendagaya, Shibuya-ku, Tokyo 151, JAPAN
TEL: 03-352-2231 FAX: 03-356-1798
TELEX: 02322485 JUSE J