

### TREND IN QUALITY CONTROL IN VARIOUS NATIONS THAT CAN BE SEEN FROM IRIS LITERATURE

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The literature on Quality Control and Reliability had always been of much interest. In collaboration with a student from Germany, while we were in graduate school, a bibliography on Quality Control was put together. The

result included the first known book on the subject, "The Control of Quality in Manufacturing," by G.S. Radford (1922). Not much else that is of interest today was located at that time. Our list was made just before the publication of Walter Shewhart's landmark book, "Economic Control of Quality of Manufactured Product" (1931).

The first known published bibliography on quality control, "A Bibliography of Statistical Quality Control", by G.I. Butterbaugh, is dated 1946. A Supplement appeared in 1951. From 1954 to 1963, The International Statistical Institute published the "International Journal of Abstracts on Statistical Methods in Industry". Butterbaugh was general editor and regional editors were: USA, C.A. Bicking; Spain, E. Blanco; France, C.R. Cassagnol; Germany, U. Graf; Denmark, A. Hald; Netherlands, H.C. Hamaker; Japan, K. Koyanagi (JUSE); and India, S.P. Vaswani.

During the early 1960's, an index was computerized by the Quality Control Branch of the Carborundum Company, in the USA. In 1968, the International Reference Index Service (IRIS) was formed and began publication of the index which

has provided much of the information for this study of trends. IRIS evolved from the International Quality Information Service (IQIS) which was named by Marguerite Thornley of the British Productivity Council. Sponsorship was also provided by committees of the American Society for Quality Control, the International Association for Quality, which became the International Academy for Quality (IAQ), and by the Carborundum Company.

When IAQ was organized in the early 1970's, it took on sponsorship of IRIS and supported it until 1984. Since then, it has been distributed from the address given under the title of this paper.

So much has been published that it would be a very difficult task to survey all the literature that has been published all over the world. It is possible, however, to trace some changes over time, particularly in the USA, and to look at present differences in content of the literature around the world. It should be remembered that the literature does not necessarily make possible direct comparison of the actual state of quality between nations, and that it is not the purpose of this article to make invidious comparisons.

The criterion used for measuring the effectiveness of national programs, as reflected in the literature, is the number of pages in a journal on which a diagram, control chart, or data analysis appears, compared to the number of pages containing nothing but printed text. This seems to be a good criterion because it can be applied even if one does not know the language in which the text is printed. The implication of this

kind of a comparison is that it is alright to tell the reader what he should do, in words alone, but that to help make improvements in quality, it is necessary to show the reader how to do what needs to be done. We need “gurus”, who pump up the enthusiasm of managers and operators, but we need, even more, practitioners who provide statistical tools for applying control at the site of action:

Based on a close look at only one or two recent issues of journals on Quality Control and Reliability from several countries, Table I is arranged, generally, in order from those journals having the largest ratio of pages on applications to those journals having the lowest ratio. In setting up the Table, some of the first issues of a journal looked at contained no applications at all. See USA, “Quality Progress”, Vol. 1, 1968- no pages on applications out of 18 pages. The same situation existed for France, “Qualite,” and for Canada “Qualite Totale”. For these two journals, a second issue was selected, generously, with the scores reported in the Table.

As of 1991, then, the three countries whose magazines seem to be serving best the needs of those responsible for controlling processes are Germany, India, and Japan. Tied for fourth place are Republic of China, Great Britain, and Poland. France and Quebec are tied for fifth (on their second chance!). Israel and the USA are tied for 6th place and EOQ and Mexico tag along at the end.

There are several observations that may be made about these results:

- 1- Magazines devoted to standardization rate lower than magazines on quality and reliability.
- 2- Magazines from French-speaking countries are well down on the list and are inconsistent.
- 3- Not surprisingly, “EOQ Quality” is next to the bottom of the list. Interest is apparently not on techniques of control.

Table I. Attention of Journals to Quality Control Applications by Country

Country	Name of Journal	Pages with Graphic or Numerical Examples
Germany	Qualitaet und zuverlaesigkeit	1 out of 2
	Standardisierung und Qualitaet	1 out of 3
India	The Q-R Journal	1 out of 2
Japan	QC Circle	Almost every page
	Total Quality Control	1 out of 2
USA	Industrial Quality Control	
	Vol. 1, 1944	1 out of 2
	Quality Progress	
	Vol. 1, 1968	0 out of 18
	Vol. 24, 1991	1 out of 6
	IEEE Transactions on Reliability Standardization News (Special Issue on Statistics)	1 out of 3 1 out of 4

Rep. of China	Quality Control Journal	1 out of 3
Great Britain	Quality Forum	1 out of 3
Poland	Problemy Jackosci	1 out of 3
France	Criteres	1 out of 4
	Qualite	1 out of 5
Canada (Quebec)	Qualite Totale	1 out of 5
Israel	Mati (Jr. of Standards Society)	1 out of 6
EOQ	Quality	1 out of 8
Mexico	Calidad	1 out of 13

4- In the USA, “Quality Progress” was substituted for “Industrial Quality Control” in 1968 (Notice loss of the word “Control” from the name of the journal of the ASQC- so far ASQC has resisted regressing to ASQ).

“Word merchants” dominate the quality scene in the US. That is, attention is paid to those telling society what it has to do, but very little attention is given to those telling society how to do it. There was an immediate reduction in attention to applications in “Quality Progress” from which it has never recovered. It now rates near the bottom of the Table, with “Mati” the standardization magazine of Israel.

The writer had an article in Vol. 1, No. 7 of “Quality Progress” entitled “Technical Perfection and Technical Control”. It contained no examples, but was a critique of the loss of interest in technical aspects of quality that had become apparent in the early 1960’s. It concludes that:

“The advantages of a high level of technical perfection can be vitiated by a low level of technical control. A lower level of technical perfection can be, to some extent, offset by a high level of control.

“Greater technical perfection to counterbalance poor control is likely to be more difficult and more costly than the achievement of a state of statistical control.

“The imperative now exists for the melding of the deterministic perfection of the engineer with the probabilistic control of the statistician.”

So, by the late 1960’s in the US at least, the stand-off was between process engineering and process control. Where was management? According to a recent article by D. L. Runkle, of General Motors Corporation, management followed a product path that relied on existing mass-production techniques. About 70% of R and D money was spent on product and 30% on manufacturing. Management had isolated itself from the production line. Runkle points out that while the Japanese were copying US products, they were not copying our management or manufacturing practices. Japan invested 70% of its R and D on manufacturing and 30% on product.

The action began in Japan back in the 1950’s. What was missed out on in America was realization that to improve the product, you have to improve the process. What Mr. Runkle discovered in GM, was also going on in the plants of his US competitors. In the early 1980’s, this consultant was told by

the manager of the casting division of an auto company, “We have been working on controlling the process for the past two years. Now we are going back to controlling the product”. What he meant was that he was going to let the process run as it might, but weld the blowholes which would inevitably occur in their castings. About the same time, it was observed in a large electronics manufacturing plant at any time, 60% or more of the product being worked on was rework. It is unbelievable that they had never heard, “Make it right the first time”.

In a July 29, 1991 article in the Washington (D.C.) Post by William Raspberry, one of its regular columnists, he reports on a recent poll taken in the US that stated, “Quality Improvement has become a major strategic goal and a growing priority of most American Companies”. The report continues, “But the concept is so new that it is too soon to report results”. “Now it appears to be dawning on US business leaders that quality is not just another sales trick, like low-interest financing”. What has been going on?!

Articles had been appearing in US journals: in Testing (1924); Jr. of the American Statistical Assoc. (1926); Bell Systems Technical Jr. (1926); Jr. of the Franklin Institute (1928); Jr. of Forestry (1928); Mechanical Engineering (1932); American Machinist (1932); Econometrics (1933); Jr. of the Society of Glass Technology (1933); Jr. of the Royal Statistical Society (1933); Automotive Industries (1934); and, Proceedings of the American Society for Testing Materials (1934). After Radford’s book, there were books on applications by Becker, Plant, and Runge, Germany (1927) and by L. H. C. Tippett, Great Britain (1929).

Shewhart’s book was published in 1931. By 1944, there was a Society of Quality Control Engineers, later to become part of the American Society for Quality Control. Many companies were already reporting on good results from application of statistical techniques to process control. Mr. Raspberry had it right when he wrote:

“What is needed is renewed interest in making quality a top priority. A few companies may do reasonably well knocking out make-do products to be sold on the cheap. But American industry in general will remain in difficulty until it figures out the obvious: The American consumer’s flight to imported products is, at bottom, a search for quality.

“There was a time when ‘made in America’ was synonymous with quality. To hear quality now described as ‘new concept’ is to know beyond doubt what has gone wrong.”

There should be no problem with placing Japan at the top of the list of successful appliers of the correct principles; that is in spite of the high reputation of Swiss watches and the comparably high standing of other countries. Note well that the location of all the runners-up is not Western Europe. Any nation in the world can excell.

In a recent contribution to a book memorializing the late Professor Dr. Kaoru Ishikawa, some of the characteristics that made him pre-eminent in the field of quality control are mentioned. They might well be copied by those who would like to be effective in their own countries. He was of such stature that managers listened to him. He was aware of the difficulties in implementing control on the production line, and he was able to help foremen and workers. He knew, in his words, that: “Techniques must practiced on the job”! His “Guide to Quality Control” (1974), should be required study by anyone involved in statistical process control.

There are a number of countries in which journals dealing with quality are published. The fact that they have not been mentioned here does not mean that they are not important.

The title of this paper indicates that it will deal with trends. So, in conclusion, the following assessment is ventured on trends in the USA (and probably in other countries in the West) and in Japan.

Change has occurred in what appear to be approximately 15 year cycles:

	USA	JAPAN
1930-45	Slow introduction in some of US industry of control procedures developed in Bell Laboratories by Shewhart and associates.	Nothing happening
1945-60	Substantial growth of SPC initiated by needs during WW II.	Introduction of SPC in Japan in the middle of this period.
1960-75	Efforts at process control exceeded by attention to other areas of management	Japan becomes premier practitioner of SPC
1975-90	US importing quality methods back from Japan	Japan continues to surpass US in quality
1991-?	US discovers “Quality”, but listens mainly to the “Word merchants”.	Japan makes customized bicycles and ladies shoes and is working on customized automobiles.

Who is going to say, “Get your nose out of the magazines and get around and see what is really going on.”?

This article was submitted from Dr. C. A. Bicking for his special lecture given at JUSE International Seminar on TQC which took place from October 14 to 18, 1991 in Tokyo.



## 1991 DEMING PRIZE WINNERS



### The Deming Prize

Dr. Kenji KUROGANE  
Lecturer, Tokyo University of Fisheries  
(Born June 21, 1929)

[Reason for Selection] Research, promotion, and enlightenment regarding quality control for many years.

As the head of the Statistical Research Office of the Tokai District Regional Fishery Research Laboratories of the Ministry of Agriculture and Forestry, Mr. Kenji Kurogane was long engaged in the research on statistical methods in the science of fisheries. He has also made great contributions to the development of quality control in the food industry since earlier. After retiring from governmental service in 1980, he served in such important posts as lecturer at the Tokyo University of Fisheries; counselor, Union of Japanese Scientists and Engineers; counselor, Japanese Standards Association; and member, the Deming Application Prize Subcommittee. He is also playing a prominent role in giving lectures on quality control and promoting activities for whole-company enforcement of Total Quality Control (TQC).

Recently, in particular, his excellent ability in extending TQC guidance to business leaders has been highly evaluated.

### The Deming Application Prize

#### NEC KANSAI, LTD.

(VLSI, compound semiconductor, transistor and capacitor, color braun tube, thermal fuse)

Employee: 4,050

President, Mr. Akira KUROIWA

#### NACHI-FUJIKOSHI CORP.

(tool, bearing, machine tool, hydraulic equipment)

Employee: 4,866

President, Dr. Kunio OHWADA

#### HOKUSHIN INDUSTRIES, INC.

(rubber made precision mechanical equipment - in the field of vehicle, information equipment and fiber equipment)

Employee: 641

President, Mr. Katsuyoshi ICHIKAWA

### The Deming Application Prize for Small Enterprise

#### SIN'EI INDUSTRIES CO., LTD

(Automobile parts - high-grade coating product, rust preventive product)

Employee: 512

President, Mr. Kazutoku MATSUOKA

#### NIIGATA TOPPAN PRINTING CO., LTD.

(industrial printed wiring panel)

Employee: 382

President, Mr. Masasuke FURUTANI

### The Deming Application Prize for Oversea Companies

#### PHILIPS TAIWAN LTD. (Electronic products)

Employee: 8,271

President, Mr. Y. C. LO

### Japan Quality Control Medal

#### AISIN AW CO., LTD.

(automatic transmission)

Employee: 4,000

President, Mr. Michio MARUKI

# TOP 52 JAPANESE COMPANIES RANKED IN THE WORLD'S 250 BIGGEST INDUSTRIAL CORPORATIONS

## — FORTUNE REPORT 1991 —

In "World's 500 Biggest Industrial Corporations 1990" reported in the Fortune magazine (July 29, 1991 issue) 111 Japanese companies were ranked in.

Following is a list of 52 Japanese companies among the half top 250 corporations.

Winner companies of The Deming Application Prize, Factory Award by Deming Prize Committee and Japan QC Medal are indicated with a different mark in front of their name.

Number of winner companies are 25 among 52 companies. Among 111 companies, the winner companies are 38.

- |  |  |
|--|--|
| ☆○ 1. TOYOTA MOTOR CORPORATION ('70, '65) - a  | ○ 27. ASAHI GLASS CO., LTD. ('55) - g                    |
| ○ 2. HITACHI, LTD. ('55) - b                   | ○ 28. KAWASAKI STEEL CORP. ('53) - c                     |
| □ 3. MATSUSHITA ELEC. IND. CO., LTD. ('66) - b | 29. COSMO OIL CO., LTD. - d                              |
| ○ 4. NISSAN MOTOR CO., LTD. ('60) - a          | ○ 30. ASAHI CHEMICAL INDUSTRY CO., LTD. ('52) - h        |
| ○ 5. TOSHIBA CORPORATION ('53) - b             | 31. MITSUBISHI KASEI CORPORATION - i                     |
| 6. HONDA MOTOR CO., LTD. - a                   | 32. TAIYO FISHERY CO., LTD. - j                          |
| ☆○ 7. NEC CORPORATION ('73, '52) - b           | 33. DAI NIPPON PRINTING CO., LTD. - k                    |
| ○ 8. MITSUBISHI ELECTRIC CORP. ('56) - b       | 34. SUMITOMO CHEMICAL CO., LTD. - i                      |
| ☆○ 9. NIPPON STEEL CORP. ('75, '51) - c        | ○ 35. FUJI PHOTO FILM CO., LTD. ('56) - i                |
| 10. SONY CORPORATION - b                       | △ 36. MATSUSHITA ELECTRIC WORKS, LTD. ('81) - l          |
| 11. FUJITSU LIMITED - b                        | 37. JAPAN TOBACCO INC. - l                               |
| 12. MAZDA MOTOR CORPORATION - a                | ○ 38. SUMITOMO ELECTRIC INDUSTRIES, LTD. ('62) - m       |
| 13. MITSUBISHI MOTORS CORPORATION - a          | 39. SUZUKI MOTOR CORPORATION - a                         |
| □ 14. MITSUBISHI HEAVY IND., LTD. ('73) - a    | 40. TOPPAN PRINTING CO., LTD. - k                        |
| 15. NIPPON OIL CO., LTD. - d                   | 41. SNOW BRAND MILK PRODUCTS CO., LTD. - n               |
| ○ 16. SUMITOMO INDUSTRIES, LTD. ('53) - c      | 42. NIPPON MINING., LTD. - m                             |
| □ 17. BRIDGESTONE CORPORATION ('68) - e        | 43. KAWASAKI HEAVY INDUSTRIES, LTD. - a                  |
| 18. CANON INC. - f                             | ☆○ 44. KOMATSU, LTD. ('81, '64) - o                      |
| 19. IDEMITSU KOSAN CO., LTD. - d               | ○ 45. TORAY INDUSTRIES, INC. ('54) - h                   |
| 20. SANYO ELECTRIC CO., LTD. - b               | ○ 46. RICOH CO., LTD. ('75) - f                          |
| ○ 21. NIPPON DENSO CO., LTD. ('61) - b         | △ 47. KUBOTA CORPORATION ('76) - o                       |
| 22. ISUZU MOTORS LTD. - a                      | □ 48. ISHIKAWAJIMA-HARIMA HEAVY IND. CO., LTD. ('76) - a |
| ○ 23. NKK CORPORATION ('58) - c                | 49. TONEN CORPORATION - d                                |
| 24. SHARP CORPORATION - b                      | 50. DAINIPPON INK & CHEMICALS, INC. - i                  |
| 25. SHOWA SHELL SEKIYU, K.K. - d               | 51. KIRIN BREWERY CO., LTD. - n                          |
| △ 26. KOBE STEEL, LTD. ('89) - c               | 52. MITSUBISHI MATERIALS CORPORATION - m                 |

☆: Japan QC Medal

○: Deming Application Prize

□: Deming Application Prize for Division

△: Factory Award by Deming Prize Committee

Note : Alphabets indicates the type of industry each company belongs to.  
Please refer to the next page for its classification.

## NUMBER OF WINNER COMPANIES OF DEMING PRIZE AND JAPAN QC MEDAL

Year	Large Enterprise	Small Enterprise	Division	Overseas	Factory	Japan QC Medal	Total
1951	4 (i,i,c,c)						4
52	7 (h,i,i,h,b,b,h)						7
53	4 (c,i,c,b)						4
54	3 (o,h,i)						3
55	3 (g,b,p)						3
56	4 (i,o,i,b)						4
57	-	-					-
58	4 (i,i,c,l)	1 (b)					5
59		-					-
60	3 (g,h,a)	1 (o)					4
61	2 (h,b)	1 (a)					3
62	1 (m)	-					1
63	1 (i)	-					1
64	1 (o)	-					1
65	1 (a)	-	-				1
66	1 (a)	-	1 (b)				2
67	1 (c)	1 (o)	-				2
68	2 (e)	1 (o)	-				3
69	-	1 (o)	-				1
70	1 (a)	-	-			1 (a)	2
71	1 (a)	-	-		-	-	1
72	1 (a)	1 (q)	-		-	-	2
73	-	2 (a,a)	-		1 (a)	1 (b)	4
74	-	2 (q,r)	-		-	-	2
75	1 (f)	3 (a,s,q)	-		1 (i)	1 (c)	6
76	2 (f,l)	1 (o)	1 (a)		2 (o,o)	-	6
77	1 (a)	-	-		1 (a)	1 (a)	3
78	1 (b)	1 (q)	-		-	-	2
79	4 (t,i,b,f)	1 (b)	-		1 (c)	-	6
80	4 (a,a,a,f)	1 (q)	-		1 (i)	1 (a)	7
81	-	2 (b,b)	1 (f)		1 (l)	1 (o)	5
82	4 (t,b,b,f)	2 (a,o)	-		-	1 (a)	7
83	2 (t,c)	1 (a)	-		1 (b)	-	4
84	3 (u,a,b)	2 (b,c)	-		-	-	5
85	4 (o,e,i,i)	3 (t,l,a)	1 (b)		-	1 (a)	9
86	2 (o,t)	2 (b,t)	-		-	-	4
87	4 (a,l,b,b)	-	-	-	-	-	4
88	3 (a,a,a)	-	1 (r)	-	1 (n)	-	5
89	5 (l,l,o,b,t)	2 (m,o)	-	1 (u)	2 (c,g)	-	10
90	3 (a,o,b)	-	-	-	1 (n)	1 (a)	5
91	3 (b,o,e)	2 (a,k)	-	1 (b)	-	1 (a)	7
Total	91	34	5	2	13	10	155

\* Alphabets shows type of industry as follows.

- |                                       |                               |                         |                        |
|---------------------------------------|-------------------------------|-------------------------|------------------------|
| a. transportation equipment           | b. electrics                  | c. steel                | d. petroleum refining  |
| e. rubber products                    | f. precision instruments      | g. ceramics             | h. textiles            |
| i. chemicals                          | j. farming, forestry, fishery | k. publishing, printing | l. other manufacturing |
| m. non-metal products                 | n. food                       | o. general machinery    | p. pulp, paper         |
| q. metal manufacturing                | r. service                    | s. plastics             | t. construction        |
| u. nuclear power, electric power, gas |                               |                         |                        |

## JUSE 4th International Seminar on TQC for Senior Management

— October 14 to 18, 1991 —

This seminar which started in 1988 by the strong request from overseas has become the 4th this year and this 5-day seminar took place from October 14 to 18 at Keio Plaza Intercontinental Hotel in Shinjuku, Tokyo.

The main subject of this seminar was to have QC Coordinators learn TQC Practice. We had total 66 participants from 17 countries which are Australia, Canada, Colombia, France, India, Ireland, Italy, Korea, Malaysia, Mexico, Norway, Philippines, Portugal, Singapore, Sweden, Thailand and U.S.A..

At the case study, members were divided into two groups and visited Fuji Xerox Co., Ltd. and Yaskawa Electric Corporation respectively.



### JUSE TQC Seminar for Indian Top Management

JUSE organized TQC Seminar specially for Indian Top Management by the request of Confederation of Engineering Industry (CEI) for 5 days from September 2 to 6 at Century Hyatt Tokyo in Shinjuku.

This seminar became the third this year starting in 1989 under the purpose of promoting Indian industries by introducing Japanese TQC. Participants were total 23 from representative firms in India.



### JUSE TQC Seminar for Brazilian Managers

JUSE hold its first TQC Seminar for Brazilian by the request made by FUNDAÇÃO CHRISTIANO OTTONI (FCO), Federal University of Minas Gerais. This 2-week seminar, May 27 to June 7, was programmed as one week for lectures at Century Hyatt Tokyo followed by one week company visits in Osaka, Nagoya and Tokyo.

28 participants in total were Directors and Managers of representative companies in Brazil.



## COME & GO

### 23rd QC Circle Study Team Visits East Europe

The 23rd QC Circle Study Team composed of 13 members, Mr. Tadasu Fujita as a Team leader and Mr. Ichiro Miyauchi as a Coordinator, visited East Europe for 13 days from September 14 to 28. They visited total 7 countries which are Germany, Hungary, Austria, Czechoslovakia, Switzerland, Belgium and France.

The team members were QC Circle facilitators and QC Circle leaders from Japanese representative firms. They spent fruitful time at every visits to QC Circle Associations and firms in each country sharing their experiences and exchanging informations.

The firms and organizations they visited were as follows.

- Germany : DQCG (Germany QC Circle Association), NARVA
- Hungary : KONTAKTA KONTAVILL, KOBAL
- Austria : Federal Economic Chambers
- Czechoslovakia : Czech Society for Quality
- Switzerland : QC Circle Conference at Friburg University, CAFAG, NESTLE
- Belgium : BEKAERT
- France : FAQ Ouest

It was reported from the members that all firms and organizations received the team with warm welcome.



### France QC Circle Study Mission

The organizer of this mission, FAQ Ouest, is one of the member organizations of European Federation of Quality Circles and Quality Management Association (EFQCA) and they sent their first study mission to Japan this year. The study mission was composed of 16 Directors and Managers from the affiliated firms in France.

They started their tour from visiting JUSE on September 30 and returned back to their country on October 9. During their stay in Japan they visited 11 leading companies on TQC in the field of Manufacturing and Service Industry.



### 29th and 30th QC Circle Cruising Seminar visits Hong Kong and Taiwan

The 29th JUSE QC Circle Cruising Seminar departed from the Port of Tokyo on July 9, with 484 trainees and 10 lecturers and secretariat members on board. In Taiwan, participants were divided into 11 groups and visited 11 factories in 9 companies in Kaohsiung.

The 30th QC Circle Cruising Seminar had conducted from September 25 to October 8 under the same route. 491 trainees divided into 11 groups had visited 11 factories in 9 companies in Kaohsiung, Taiwan.

Both seminar team made presentations and exchanged experiences on QC Circle activities at factory visits and enjoyed sightseeing in Hong Kong.

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