

## Newsletter - Thinking back on 2011 - Noriaki Kano

The greatest shock the year 2011 brought to most of the Japanese people was the Great Earthquake and the Tsunami that followed in the northeast of Japan, as well as the accident of the Fukushima No.1 Nuclear Power Plant caused by the earthquake and tsunami. Discussion on the great impact this incident gave me as an expert of quality management would be a heavy one due to its gravity, and I would like to discuss this at the end of this newsletter.

### 1. Overseas Travels on Business and as Tourist

#### Swimming in the Dead Sea

One of an interesting experience I had in my trips overseas this year was bathing in the Dead Sea when I visited Jordan for the first time. Tourist information suggests various styles of enjoying, such as siesta and reading styles. As I tried taking such postures, however, I found it difficult to balance myself while taking care not to let water with 30% salt content get into my eyes, and found out that tread water was best suited for swimming for a short while. While you can barely keep your shoulders above water surface in ordinary sea water, your upper chest sticks out of water at the Dead Sea. I found not a single plant growing there on the shore and water was almost ominously clear. It is because no flora or fauna (including waterweed or algae) grow or inhabit there, making me realize the true significance of the name, the 'Dead Sea'.

#### Ruins of Jerash (Jordan) and Remains of Ephesus (Turkey)

Both of these historical sites were built during the days of the Roman Empire. Remains of many magnificent streets and buildings are still found there. Ruins of Jerash, which had been buried under sands after being destroyed by a major earthquake in the mid-8th century, started to be excavated in the early 20th century. According to the guide, excavation of only one third of the total ruins has been completed so far. Both lands used to be colonies of the Roman Empire. For us who witnessed liberation of former colonies after the Second World War, colonies meant exploitation, or so we learned, but these ruins gave me impression that something which cannot be explained with such a simple concept, or philosophy of a higher level based on the 'win-win relationship', was a basis of building such cities. The Gate of India in the old town of Mumbai, as well as the Mumbai Central Station built with marvelously engraved walls, gave me an impression which led me to surmise that there was a similar philosophy in the management of British colonies to that of the Roman Empire.

#### Hue (Central Vietnam)

Although I had visited Hanoi and Ho Chi Minh before, it was the first time for me to visit Hue and other parts of central Vietnam. While I had known Vietnam as a Buddhist country, this trip taught me that there were days when Hinduism was the country's national religion. It came to my knowledge also that, around in the late 19th century, Romanized letters came to be used rapidly replacing Chinese characters which were once used in Vietnam, and Chinese characters are not used at all today. It is hard to believe that a man in power of the times can change characters to be used so easily. While Vietnamese language is now written using phonograms, the fact that it has many similarities with the Chinese remains unchanged. It was interesting to know that four countries, i.e. Japan, Korea, China and Vietnam form a cultural sphere of languages which developed around Chinese characters, as well as of chopsticks (which means, rice sticky enough to hold with chopsticks is eaten). As you travel to Cambodia and further west, you will find another cultural sphere where rice is not sticky, more dishes are prepared in stews and soups in which meats are cut in small pieces beforehand, which people eat with spoon and forks. The sphere extends to Uskudara, the west-most town of Asia Minor.

#### Statistics about My Overseas Travels

The number of overseas travels I made and the total number of days covered in 2011 were: 17 times and 198 days, respectively, showing a great increase over the previous year with 14 times and 181 days.

Countries visited totaled 12, including Jordan and Brunei, which I visited for the first time, as well as Italy, India, Taiwan, Thailand, Vietnam, Korea, Sweden, Greece, Turkey and the UAE. The cumulative total of the number of countries visited so far has become 61, the number of overseas travels made, 302, and the total number of days spent overseas has reached 3,556 days (equivalent to around 9.7 years.)

## **2. Health Maintenance**

### Kotta River Cleanup Operation

The Operation was sluggish in 2011, because I made many overseas trips as shown above and spent fewer days in Japan. Compared to previous years, in which I collected more than 100 bags (40 litters each) of rubbish per year, only 50 bags or so were collected in 2011. I walked along the Kotta River (5 km one way) in the end of the year to observe conditions of the river. In spite of my anticipation that it may be covered totally by rubbish, conditions of the river surface and banks on the either side of the river were not so bad as not to be cleaned up over a few days of hard work, to my relief. I wrote in the Newsletter of 2010 that some change seemed to be occurring in the minds of the people who used to throw rubbish. The favorable trend appears to be continuing.

### Workout in Training Gyms

Kotta River Cleanup Operation had originally been started as a health maintenance program aiming at weight reduction. As overseas business trips increased, however, I felt that the Operation alone was not enough in stopping the weight increase, and so I have adopted the habit of walking on the treadmill in the gym of the hotels I stay. Despite my enthusiasm, my weight is slightly making a rebound. I am starting to wonder if I should start controlling alcohol, my essential nightcap.

## **3. Lectures and Talks**

The total number of lectures and talks I gave in 2011 was 60, exceeding that of the previous year with 50: specifically, 19 in Japanese; 39 in English; and 2 in Chinese.

### Lecture in Chinese

What pleased me most was the lecture on the topic of the 'Attractive Quality' theory I gave in Chinese at CEMA (Chinese Excellent Management Association) in Taiwan which has National Quality Award winning organizations as members. Having asked my friend to give me a sign to switch to English when my pronunciation of my Chinese was difficult to follow, I talked through to the end in Chinese while looking at audience's faces confirming they were following. After the talk, the president of the organization gave good words to me commenting that, while the organization had invited many speakers from abroad, I was the first non-native Chinese speaker who gave a lecture in Chinese, and that they could understand me sufficiently in spite of my occasional peculiar pronunciations.

### Japan vs. Japanese

The talk for which I put the greatest effort in preparation in 2011 was one with the title of 'Japan vs. Japanese' given at the Memorial Symposium held on the occasion of the 40th anniversary of the foundation of the Japanese Society for Quality Control in May. You could say 'Germany vs. German', 'France vs. French', 'Thailand vs. Thai', 'Vietnam vs. Vietnamese', etc. by combining names of countries and adjectives meaning their culture, people and the languages. These words are generally used to mean the similar thing according to my experience, with an exception of 'China vs. Chinese'. While China means the country itself, the word 'Chinese' includes overseas Chinese who live in Taiwan, Singapore, Hong Kong, and all the other countries around the world. The prosperity of the economic block formed by Chinese both in China and overseas started to be reported from late 1990s to the early 21st century while we talk the economic prosperity of China today.

While the words 'Japan' and 'Japanese' have been used with similar connotations until recently, disparity between the two seems to be broadening these days. The case in point is the economy of Japan and the Japanese manufacturers. Decrease of GDP over the past 15 years as well as protracted deflation apparently shows that the economy of Japan has become dull. A frequent question I receive from my foreign friends is if the Japanese manufacturers have become poorer. Globalization of Japanese businesses, which started in the late 1990s, led industries to shift from non-consolidated financial

report to consolidated financial report. According to statistics of the listed companies, while their average revenues on the consolidated basis show steady growth, those on the non-consolidated basis are leveling off. On one hand, the gap between the two may account for employment creation and revenues enhancement in the countries where they invest, contributing to their growth of GDP. On the other hand, what contributes to the GDP of Japan is the revenues generated by individual companies as shown in their non-consolidated reports. Briefly speaking, while Japanese manufacturers are striving to survive through overseas investment, contributing to the growth of their GDP, their contribution to the Japanese economy is slight.

A drastic measure to remedy the situation is to invite foreign investment for generating revenue in Japan. This would help secure employment and contribute to the growth of GDP. You may argue who on earth would be interested in investing in Japan in the midst of this super-yen appreciation. I must say, look at Dubai, which is situated in dry desert and where prices are high (a hotel room charge is 1,000 dollars per night). Companies around the world invest there because there are advantages in doing so including tax benefits.

Is Japan unattractive, just because the yen is appreciating? I don't think so. What's most attractive for investors, and for developing nations in particular, is availability of Japanese retired engineers in their 60s having rich practical experience. I wonder if it is a good idea for the companies in the nations to establish organizations which will leverage technical expertise, for example, 'technology and engineering development centers' in Japan employing these retirees.

Being one of the most rapidly ageing society, Japan has many people who desire to continue working even after 60, the mandatory retirement age for most companies. Although Japan is generally known for its high labor cost, it applies to active regular workers and engineers. Moreover, those who are reemployed after retirement are given mostly part-time jobs, whose labor cost is low. These people are available for employment at relatively low cost, because they are already on pension. On the other hand, in developing nations, the disparity of the labor cost between workers and engineers is quite high. Because of this, the gap of the labor cost of engineers between in Japan and in these countries is smaller than is generally understood.

In addition, if Japan decides to establish special economic zones with reasonable incentives, I am certain that it would be able to attract foreign investment just as Dubai does, It is needless to say, however, that this will require strong political leadership, which we lack today.

#### **4. The 9th Asian Network for Quality (ANQ) Conference**

The 9th conference of the Asian Network for Quality was held in Ho Chi Minh City in September. Hosted by the Vietnamese Quality Association Ho Chih Minh City (VQAH) and held in the City Congress Hall of the city, the conference had participation of 450 people from 21 countries (including 244 people from outside of Vietnam), in which more than 150 papers were presented. ANQ was founded in 2002 for the primary objective of providing venue to young Asian quality experts for presentations and interactions. While communication in English was not so smooth in different sessions of earlier conferences, discussions have become much

smoother year by year. I found some moderators of sessions handling questions and answers in an excellent manner. A closer look made me realize that they were those who had been speaking in not so fluent English in a conference held soon after foundation of the ANQ. I cannot say that operation of the ANQ, which is composed of member countries with diverse cultural backgrounds, is faring well being free from any problems, but I am pleased to see the growth of ANQ in people's activities.

#### **5. Komatsu**

In the board of directors' meeting held in the next week after the Great East Japan Earthquake on March 11th, conditions of the damage inflicted on the Ibaragi Plant, which manufacturers dump trucks, were explained with photographs. My anticipation was that it would take several months for the plant to recover from such severe damages, and yet, it was reported at the next month's meeting that the plant had already resumed operation. I was impressed by the enormous strength of business people beyond expectation of academia put forth at times of exigency.

## **6. Deming Application Prize**

In 2011, three companies were awarded the Deming Application Prize, which is given to those who implement Total Quality Management suitable to their business philosophy, types of industry, business styles, scales and business environment. Two out of the three companies have been working under my consultation: Unimicron Technology Corporation, which manufactures printed circuit boards, etc. for cell phones, smart phones, and other electronics products, which is located in Taiwan, while CRTC, or CPAC Roof Tile Company, a member of the SCG (Siam Cement Group), manufacturing concrete roof tiles, which is located in Thailand.

When I started helping Unimicron in late 1990s, the company was hardly among the best 20 among competitors in the world, but in 2003, it ranked No. 6 in the world. And then, at last, it won the first place in 2009 in the world getting ahead of a Japanese company leading until then, making a remarkable achievement with the help of TQM. The fact that it has become a major supplier to the world's major manufacturers of cell phones and smart phones shows the company's excellence.

Another winner, CRTC, developed a very interesting tool known as Quality Claim Matrix, which enables them to visualize complaint handling status, on top of securing growth and profitability in the severe business environment caused by the Lehman Crisis, etc.

## **7. What I learned from the Great East Japan Earthquake, Tsunami and the accident of Fukushima No. 1 Nuclear Power Plant**

### **Development of Scenarios and Training of Immediate Remedy**

What worried us most in the aftermath of the accident in Fukushima was that we had not the slightest idea whether aggravation and expansion of damages could be checked after the meltdown. It was only after mid-June, when the circulating-type seawater purification system went into full operation, when hopes started rising for progress towards successful control of the situation.

The second issue was about how to take care of more than 100,000 people who had to evacuate from areas contaminated by radioactive substances. I thought people should not be able to return to their land for several decades until radioactive exposure level, calculated based on the half-life, would go back to a safe level, according to my very basic understanding of radiation. It came to my knowledge, however, that high-level radioactive materials contained in the topsoil or accumulated dust on roof tops can be eliminated by removing the topsoil and washing rooftops with water. Bottlenecks of such actions include storage of contaminated soil removed, as well as dealing with waste water after washing, which flows through sewerage into sewage treatment plants, and radioactive dust in sewage concentrated in sludge after filtration. Radioactive level in sludge is reported to be very high as a result of concentration in the treatment process. To find where and how to store contaminated soil and sludge from water treatment is the most important challenge we are faced with.

The government declared in mid-December that the Fukushima No. 1 Nuclear Plant went into the 'cold shutdown', having passed the stage with the danger of the release of radioactive materials resulting from hydrogen explosion and meltdown. They say that in the fire-fighting terminology, there are 'fire suppressed', meaning that 'the fire has been placed under control of fire brigade and the danger of expansion of fire has disappeared', and 'fire extinguished', which means that 'there is no more danger of flaring up again'. 'Cold shutdown' can probably be understood as being equivalent to the word 'fire suppression'. We are happy about achieving the first step of emergency measures. I wish to pay high

tribute and express my gratitude to those people concerned who have been fighting in the turmoil in spite of the fear of radioactive exposure and in the flood of criticisms by journalism. Although more than 100,000 people had left their homes initially because of radioactive contamination, evacuation order has been lifted in some areas. It is reported, however, that still many people are forced to lead difficult lives in shelter homes. Quick actions are expected so that they may go back to their homes and resume their usual life as early as possible. Before Fukushima, I thought that immediate remedy for addressing emergency can be flexibly taken case by case depending on the conditions. But, I learned that, it is almost impossible for us to do so for systems as complex as nuclear power plants. We have to prepare

scenarios of contingency plans in advance and training must be conducted based on them.

#### Possibility vs. Probability

I have been helping power generation companies of many countries, including Tokyo Electric Power, Kansai Electric Power, and Florida Power, which was the first overseas company to win the Deming Prize, in their TQM through consultation services and lectures, because they are virtually in monopoly conditions in the local areas they serve (although the situation is changing these days) and therefore, the tacit agreement that a consultant serves one company in one industry does not apply to them. Since I took charge of power distribution and marketing, I was not directly involved in nuclear power generation, but I was provided with basic knowledge about it. Nuclear power generation consists of two processes: power generation process, in which enormous thermal energy generated by nuclear fission is utilized; and cooling process, in which waste heat is treated. When emergency arises, the former should be stopped by inserting control rods, whereas the latter should never be stopped. I have been stressing that there are two types of safety issues, i.e. Type 1 Safety Issues, in which damages can be either prevented or mitigated by stopping, as represented by railway and road traffic accidents, and Type 2 Safety Issues, in which stoppage increases danger, such as in aircraft accidents. Nuclear power generation inherently has both issues. What happened in Fukushima when the earthquake occurred was that, although nuclear fission, i.e. Type 1 Safety Issue, was stopped by automatic insertion of control rods as planned, with regard to the cooling, i.e. Type 2 Safety Issue, all power sources for operating cooling unit were deprived by Tsunami, and emergency diesel power generator stopped functioning also because of Tsunami. From the viewpoint of quality management, this is a risk management problem, as well as a problem of

crisis management after the risk management failed. Basic concept of risk management consists of principles of prediction and prevention. When a technology (mechanism, framework, or paradigm) is newly introduced, or shifted to the new one, typically not only is the targeted objective achieved but other influences are brought about. In this case, while targeted number of parameters is finite, other influences are infinite. What is required is to predict and identify negative influences in terms of health, safety, environment, pollution, equipment/system failure, performance, reliability, appearance, economy, etc. from among infinite number of influences. Generally a very large number of negative influences are listed up, and therefore, it is necessary to prioritize them for consideration. An index called RPN, or Risk Priority Number, is often used for this purpose. This method involves giving scores to negative influences identified according to their seriousness of influence (severity), frequency (probability), and difficulty for detectability, multiplying these three scores to obtain RPN for each negative influence, and prioritizing the one with the highest RPN and developing measures to prevent it first, to be followed by others with RPN in the descending order.

Although it is not certain if systematic risk assessment using RPN was conducted for the Fukushima Nuclear Power Station, whose construction started in the early 1970s, the fact that emergency diesel engine power generator was installed and that the 10-meter high tide embankment was constructed shows that some kind of risk prediction was conducted and measures were taken. Yet, the height of the tide embankment chosen was 10 meters and not more (Tsunami which attacked the power plant was 15 meters high), perhaps because probability of Tsunami above 10 meters was considered to be very low. Experts claim that the frequency of Tsunami of that magnitude is once in 1000 years or less. Even though the score of seriousness was extremely high, probability of occurrence was extremely small, leading to a small RPN, ending up in a case 'outside the scope of assumptions'.

What the case of Fukushima taught us is that, where seriousness score is extremely high, priorities should not be determined by RPN based on the probability score. Possibility rather than probability should be taken into account in such a case. My lesson is that where seriousness index is the highest and if the negative influence is a possible result, it is important to examine closely in advance how it can be abated, should it occur, if not prevented completely, through: utilizing power source cars; pouring water into nuclear reactors using fire engines; understanding and early disclosure of information on how radioactive substances scattered after meltdown (in the case of Fukushima, scattering conditions were known by the parties concerned but such information was disclosed much later); evacuation of residents from areas contaminated by radioactivity; removal of topsoil contaminated by radioactivity, etc. We have come to differentiate the use of two words, 'possibility' and 'probability'. A negative influence may be possible if not probable.

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