



Event: 150th anniversary of opening Yokohama port

【Forum for International Contribution & Report by Experts】

**Safe water to the world !
Yokohama city's international contribution
to global water environment**

On July 10th 2009, Yokohama Waterworks Bureau held a forum “Current situation of water supply sector in the world and Japanese international cooperation and expected rolls by international society”, supported by JICA and Japan Waterworks Association. The forum were divided two sessions

About 390 participants gathered there in total; citizens, people of water related companies, staff of waterworks bureaus, officers of Yokohama city, etc..



Photo: Panel discussion

In the first session, following presentations of member of JICA study teams and 4 people who attended international conferences, the expert team which was sent to the capacity building

project in Hue Water Company, Vietnam terminated last February made reports on the results of the project which successfully led to “the declaration of safe water which can drink directly from taps”.



Photo: Presentation of the expert team of JICA capacity building project in Hue, Vietnam.

In the second session, Mr. Yuji Okazaki, who is a JICA senior councilor, made his keynote lecture of “Policy of Japanese international cooperation for water supply sector in 21st century” and Mr. Ikuo Mitake, who is a senior expert of JWWA, ran the panel discussion on “Delivering International contribution from local citizens”.

In the session, there were active discussions of such as 1) the importance of cooperation of both hardware and software, 2) the importance of bringing up young human resources who will lead the international cooperation, 3) the importance of the stance to pursue international benefit and interactive benefit, and 4) the ways of international cooperation that citizens can participate in.

Reported by Mr. Ide & Mr. Sekiguchi
(Yokohama Waterworks Bureau)

**Introduction of Overseas Member
Thai Metropolitan Waterworks Authority
(MWA)**

1. Outline of Thailand

Thailand is a kingdom which has been developing drastically in South-east Asia. As attracted by calm nationality and tropical climate, a lot of tourists visit "Smile country". Thailand, which has 63 million population, 514 thousands km² in area, 3,720 dollars in GDP per capita (2007), will have graduated from developing country and is becoming semi-developed country.

According to the water yearbook 2008, coverage of the water supply in Thailand is 84% in the national average, 95% in urban areas, and 81 % in rural areas.

After the Thaksin regime which proceeded economic modernization of the country collapsed in a coup in 2006, stable political situation had changed. In December 2008, the Thaksin faction regime which returned in election was expelled because of massive direct actions such as the international airport occupation. In April 2009, this time, the coming back massive demonstration of the Thaksin group was held, but the military was sent to calm it. It would take a long time to be stabile.

On the other hand, people's life is as quiet as before, and also there seems to be no political impact to the water fields.

2. Outline of Water Supply

The water supply system in Thailand is divided to MWA (Metropolitan Waterworks Authority), which covers Bangkok and its outskirts, and PWA (Provincial Waterworks Authority), which covers



Banken WTP

the other regional cities. This time, I would like to introduce about MWA.

The information about MWA is listed in Table-1 bellow.

TABLE-1 (as of Dec.,2008)

Population served	7,919,131
Service area	2,250.5 km ²
Production Capacity	5.52million m ³ /d
Distribution amount	Ave. 4.82 million m ³ /d
Supply time	24 hours
Non revenue water rate	30 %
Total pipe length	25,094 km
Number of Connection	1,859,573 con.
Average water tariff	12.03 Bahts /m ³
Staff number	2.2 p. / 1000 con.

* 1 Baht=2.87Yen (April 30, 2009)

In MWA, JICA technical cooperation projects have implemented two times from 1985 to 1992 and from 1994 to 1999. (It was called "project type technical cooperation" at that time.) It was the first JICA project in water fields. In the project, PWA and MWA organized NWTTI (National Water works Technology Training Institute), and established the central center in Bangkok and local center in Khon Kaen and Chang Mai, which are built by Japanese grant aid. And at phase 2, once a local center was established by the Thai funds, there have been 4 training centers in total.



Campus of NWTTI (April 23, 2009)

To strengthen the training centers, various activities have been carried out by a total of 104 Japanese water engineers who were sent from local governments and universities as JICA experts and Thai engineers who are sent from both of MWA and PWA. At the same time, 50 counterparts were trained in Japan. Especially, building the leakage detection yard in the NWTTI and implementing training there were found effective, which were introduced into the other similar projects of Indonesia, Egypt, and Vietnam. After the end of the projects, the central training center of NWTTI in Bangkok has been owned by MWA and the three local ones have been owned by PWA, and each center has been actively offering training programs to staffs and outsiders which include people of neighbor countries.

The central training center which MWA owns was recently renovated and enriched training courses, where a lot of trainees have learnt.

Last year, TICA (Thai International Cooperation Agency) and JICA Thai office worked together to restart the third country training for the neighbor countries. This year is the 10th anniversary of the JICA project's end, therefore, MWA are planning to celebrate it extensively with former experts.



NWTTI, at room of the coach training course (April 23, 2009)

3. Water Quality of MWA

MWA analyzes water quality of row water, treatment plant and tap water regularly. They have a certification of ISO17025 for 4 parameters; turbidity, color, iron and Manganese. Now, water quality is checked at 600 taps in the distribution area. Most of those contain residual chlorine, staff said. In the end of JICA project, 1999, MWA declared safety of water supplied by MWA. However, even now, people do not drink the tap water directly.

Weekend during official trip, I met and interviewed two former counterparts of the project. They are MWA staff and also members of WaQuAC-Net. Their names are Ms. Nisapas and Ms. Sivilai



Ms.Nisapas Wongpat (Chief of research and development on water quality)

~Interview~

(Q) About your activity after finished the project.

(A) Ms. Sivilai; I worked as a lecturer or course leader in the third countries training course once a year. Trainees came from Cambodia, Nepal, Fiji, Pakistan, Syria, Bhutan, Sri Lanka and Samoa.

In the office, staff capacities vary greatly from person to person, I tried to level up the accuracy of data and information through comparing data which each staff analyzed each other. We checked water quality of row water taking from a channel which is used for Banken WTP and

Saimon WTP both take the raw water of a channel and we checked water quality ; dissolved oxygen, turbidity and conductivity automatically six times a day. Now, settled water contains 3NTU turbidity. Recently, algae problems have occurred. As oscillatoria and melosira make filter clogging, we dose pre-chlorine and then sulfate-aluminum.

(Q) Any request to WaQuAC-Net ?

(A) (Ms.Nisapas) I want to request to enrich the Q&A

We just have started algae measurement.

Therefore, we want to learn your experiences.

(Q) Your request on your job?

(A) (Ms. Sivilai) I hope our staff understands the importance of their job and work. (She is a director of Saimon WTP)

(A)(Ms. Nisapas) I want to be a respected specialist as Mr. Sasayama.

~After interview~

As Ms. Nisapas likes Kaiten-Sushi very much, I met her and Ms. Sivilai to talk and eat at Heiroku-sushi in the World Center at 11 o'clock on Sunday.

I interviewed them while eating sushi. They are frank and we had soon a friendly chat. We had known same persons. So our conversation grew lively. The sushi was very delicious. We stayed there for more than two hours. And this restaurant had been full. I guess Ms. Nisapas and Ms. Sivilai are education-minded mothers.

(Ms. Yamamoto)



Ms. Nisapas ,Ms. Sivilai, Ms.Yamamoto
At Heiroku-sushi in the World Center, Bangkok

Introduction of New Members

(as of September 2009)

- ◇ Ms. Eng Saloth (Cambodia)
- ◇ Mr. Peng Ty (Cambodia)
- ◇ Mr. Mon Tito (Cambodia)
- ◇ Ms. Sophak Ros (Cambodia)
- ◇ Mr. Xaypaxa Liengsone (Laos)
- ◇ Ms. Petpailin Suwanatat (Thailand)
- ◇ Ms. Kittirat Wong-in (Thailand)
- ◇ Ms. Chonlathorn teschim (Thailand)
- ◇ Ms. Palsiri Sriungruang (Thailand)
- ◇ Ms. Siriporn Laewyasri (Thailand)
- ◇ Mr. Uemura Mitsuro (Japan)
- ◇ Mr. Kido Azuma (Japan)
- ◇ Mr. Tabata Toshimasa (Japan)
- ◇ Mr. Ogata Ryuji (Japan)
- ◇ Mr. Kakegawa Tomohito (Japan)
- ◇ Mr. Murayama Hiroshi (Japan)
- ◇ Mr. Nagashio Daiji (Japan)
- ◇ Mr. Ehashi Nobuo (Japan)

◆ *We welcome new member any time.
Please contact our office.*

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Next activity

Newsletter No.5

Special Report on Arsenic Pollution

Question & Answer Corner

Q: Could you show me an image of algae's presence in the sedimentation tank? How do they influence to water treatment process? (Questioner : Ms.T.T.M.T.)



A: There are two types of algae; attached algae and floating algae (plankton algae), in the sedimentation tank. In some cases, small animals live in the colony of attached algae. When the colony of attached algae grows largely, it detaches from wall or becomes a core of mud ball and causes filter clogging. Odor algae such as *Anabaena* emit odor substances into water. And these substances can go through the filter and get to the tap water. It gives people using this water an unpleasant feeling.

1. Attached algae

[Growing place] When there are no pre-chlorination or few pre-chlorine, it is mainly attached algae that grow in sedimentation tank. They make some colonies on the wall or trail in the shape of string in the water. Therefore, people may mistake them as dirt such as scale.



Image photo

[Influence to water supply] This colony is not obstacle to water treatment process but one of nuisance creature. Once the colony, however, grows largely and detaches itself from the wall, it settles down on the surface of sand filter or becomes a core of mud-ball. They may make filter clogging. Small algae scattered by breakup of the colony can go through the filter and come into the treated water sometimes.

[Countermeasures] You do not have to think of algae growing seriously. However, in case that

attached algae grow too much, as a stopgap measure, you should lower the water level of sedimentation tank by about 30cm and spray water to attached algae by fire hose for scattering them. Of course, when you try this measure, it is thought that the detached algae might cause filter dirty or clogging. Therefore, you have to discuss with operators about water volume and time for backwashing the filter.

2. Floating algae

2-1 Floating algae -1

[Growing place] Horizontal-flow type sedimentation tank with enough surface space has plenty of detention time sometimes. In case high turbid substances consist of clay or laterite in raw water and settle down quickly at the beginning of sedimentation tank, surface of the latter half of sedimentation tank is filled by clear water. Algae live in the raw water but they cannot glow well, because sunlight is shield by high turbid substances. However, the algae glow quickly due to get a lot of sunlight in the clear water of the rear of sedimentation tank.

[Influence to water supply] If a lot of odor algae like *Anabena* glow in the water treatment plant,

the biologist working in the water treatment plant must be reviled by staff. Because, floating odor algae in the settled water are killed instantly with intermediate chlorination and emit odor substances such as *Geosmin* into settled water.

[Countermeasures] These odor substances can not be captured by the filter. And these substances may come to taps, which makes users unpleasant feeling. If this problem happens, the best solution is usually granular activated carbon to remove them. However, there is no dosing space of activated carbon after filtration. We can do nothing about it. As drastic measures, there are several ways. One is to dose chlorine and activated carbon in the same time to the sedimentation tank. Others are to empty the sedimentation tank once and disinfect it by chlorine, or to shield the surface of sedimentation tank from sunlight. But all of them are not easy and make some difficulties.

2-2. Floating algae-2

[Glowing place] Sometimes surface water in the sedimentation tank seems to be covered oil or dust. At times like this, when you put your hand into the water, green film sticks to your hand. They are green algae such as *Coccomyxa* and *Tetraspora* mostly. The size of cell is 5-15 μm . They are anti-chlorine and their multiplication speed is very high.

[Influence to Water Supply] Most of these algae in the settled water can go through the filter and cause increase of turbidity in the distribution water.

[Countermeasures] When you find this problem, you should raise the water level of sedimentation tank to drain stagnant surface water in which algae are glowing. In other way, you should dose post-PAC around 0.5mg/L in the settled water to make floc film in the surface of sand filter. The floc film can capture

microscopic algae.

3 . Additional information : Small animals

[Glowing place] Attached algae make colony on the wall of sedimentation tank. The colony is a small world of living different kind of algae, bacteria and animals. I want to focus an animal here. It is *Nematoda*. They live in raw water. Some of them live in biological film of the algae colony and eat bacteria and remained organic matter. They glow and lay eggs there. When living density become high or reduce food, they escape from the colony. When colony detach from the wall, they also escape. After drifting in the water, they may go through the filter, and come to treated water.

[Influence to water supply] They can be killed by exposure to residual chlorine with time . But some anti-chlorine ones can survive in the film on inside wall of pipe.

[Countermeasure] I have never heard the report that these animals transmit infectious disease. But once you find existence of them, the condition inside of the pipe can also allow bacteria or organic matters to live. In the condition of water stagnation, chlorine consumption tends to become larger than usual.

As above, sometimes bacteria and animals are living inside of pipes. We call them "Pipeline creature" generally. The mode of their life is not clear yet. If studies are carried out in many countries, we are able to have more knowledge of them, which will be useful for water quality management and maintenance of pipe network.

Reference:

Japan Water Works Association. "Organisms of Water Supplies in Japan –Photographs and Descriptions-2000"

Answer: Mr. SASAKI Shinichi
(Yokohama
Waterworks Bureau)

