



WaQuAC-NET Newsletter vol.24

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1. Technical Q&A



Question & Answer Corner

We welcome any opinions, and questions to this Q & A Corner. Please contact us.

Q: Now we are using powder PAC as coagulant in WTP. Recently, a company which provides liquid PAC has established in my country. I consider using liquid PAC. So, I want to know the specification, life time, storage and advantage and disadvantage of liquid PAC.

(M.N, Cambodia)

A-1 Answerer:

Ms. Chaweepan Suangkiattikun, Metropolitan Waterworks Authority, Thailand



For the question about PAC, I have to say that I don't have direct experience in using liquid PAC since it has been used at Bangkhen WTP only. But during the raw water turbidity crisis in year 2006, I had used powder PAC for a short period for about 3-4 weeks. In my opinion, there are pros and cons in term of usage. But powder PAC and liquid one are not much different in chemicals composition, because they are selected by the similar specification.

The advantage of powder PAC is that it is easy to

Handle for its storage. Only keep it in dry place and manage by "first in, first out" not to expire. It has normally 2 year shelf life in powder form and 6 months after preparing solution. The disadvantage is that powder PAC requires a machine to prepare PAC solution and a little time to allow that the chemicals chain becomes stretch before usage in order to get good coagulation efficiency. The preparation time may take 3-4 hours before use. If preparation time is not long enough, the coagulation efficiency might be lower and needs more coagulant to be added. It is costly.

For the liquid PAC, it is much easier to use. It only needs stock tank and metering pump. So usage

of Liquid PAC decreases the work load in preparation step. But the important concern is its shelf life and stock tank. The shelf life is less than 1 year (I don't know exactly). The concentration is normally 30-40%, therefore the higher concentration leads to higher chance to precipitate in stock tank. And lower concentration needs more space to place stock tanks. If WTP has limited space and the same size of space for storage of powder PAC, the total PAC stock will decrease to one third. It means that it increases a risk in chemicals stock management. The big concern is that the supplier should have enough capacity to supply liquid PAC firmly and continuously.

A-2: Answerer
(Mr. Shingo Hayashi,
Osaka Water Supply Authority)



Regarding the question about liquid PAC, when powder PAC is used in liquid form, coagulation effectiveness is same as liquid PAC. Advantages of PAC comparing alum is explained in the back number of the newsletter;

http://waquac.net/english/pdf/newsletter200906_en.pdf

If liquid PAC is purchased and kept in the plant, there are some technical points about storage as follows.

- Store in a cool dry place away from direct sunlight. Liquid PAC tends to decompose to a white turbid solution when it is stored at temperature higher than 40°C.
- Liquid PAC becomes unstable and loses effectiveness when it is kept long as a diluted solution of less than approximately 3% (as Al₂O₃)
- Store and transport in corrosion resistant containers such as rubber lined steel, PVC, FRP, polyethylene, etc.
- Precipitate is produced when it is stored for a long time, it will cause blockage of dosing pump and piping. So, clean the storage tank and

injection pipe regularly.

- Furthermore, regarding shipping of liquid PAC; it is very sensitive to transportation over long distance.

Many water suppliers in Japan follow the Japanese Industrial Standard (JIS) for liquid PAC for the specification.

http://www.waquac.net/pdf/data/standard_criteria_01.pdf

In using liquid PAC, we have experience that pipeline was clogged between storage tank and service tank. It was raised by crystallization of liquid PAC because the flow velocity was very low due to large diameter piping. After the trouble, double pipe system was installed and piping is cleaned regularly.

A-3 : Answerer
(Mr. Katsutoshi Kagata,
Former Staff of Kitakyushu Shi
Waterworks Bureau.)



When you change a coagulant from powder PAC to liquid PAC the renovation of dosing facility is required. The concentration of liquid PAC is 10% as Al₂O₃ in Japan. The liquid PAC you can get in your country is maybe 10% same as in Japan. I think currently you may make 10% of PAC solution by dissolving 30% of powder PAC to water. If you do so, the dosing volume should be same as current volume. Therefore, the solution tank and the dosing facility are possible to use without renovation. However a new storage tank and the transfer pump system from a storage tank to a service tank (current solution tank) are necessary. A storage tank should be put a place where a tank truck can send liquid PAC. If you change a coagulant from powder to liquid, the dissolving work become needless but the cleaning work of tank and dosing pipe is still necessary. The coagulation efficiency does not change, because the specifications of liquid PAC and powder PAC are almost same.

2. Information of Oversea Members

★ Introduction of New member ★



New member is Ms. Patchraporn Itthirotjanakul. Her nickname is Oil She is a scientist of MWA (Metropolitan Waterworks Authority), Thailand and has come to Japan for participating in the Kanagawa Oversea Technical Training Course on August 26, 2014. Training contents were Japanese language for one month and water quality subjects for 5 months. Mr. Sasayama interviewed her on December 22, 2014

©Ms. Oil's interview- Her life in Japan -

Q: How is your life in Japan? Are you doing well from the first?

A: I couldn't catch people's speaking Japanese and people didn't speak English. So, I met difficulty for shopping.

Q: What was the most difficult case?

A: When I entered a ramen shop, I found the vending machine to buy a ticket. But all the information was in only Japanese. I could not find the way to choose my favorite. Then I gave up ramen noodle. Really I had no problem to buy Tako-yaki by pointing to a shopkeeper.

Q: What is the most difficult point to speak Japanese?

A: Difference between "Kon-nichi-wa" and "Kon-ban-wa". I sometimes got unexpected answer though I guessed I said in right way. I cannot distinguish the exact difference of these expressions yet.

Q: What difference do you feel between Japan and Thailand?

A: Most of staff members who are working in my training place came to work when a typhoon hit. Staff shows strong sense of responsibility. I like it. Staff worked without rest when problems happened. It is quite different from Thailand. And time management in Japan is absolutely severe. Anyone never come late even a minute till the beginning time of work.

Q: How do you take meals?

A: I cook rice for breakfast, lunch and supper in every morning. I buy some foods for lunch on the way to the training place.

Q: What training do you have now?

A: I have practice of analysis with TOC (Total Organic Carbon) analyzer, ion chromatograph and liquid chromatograph at water quality center of Kanagawa prefectural waterworks.

Q: Thank you very much. Please do your best to your training for the remained period.

Ms. Oil has improved not only water quality analysis but also Japanese language.

She went back to Thailand on March 13, 2015.

She said "I will come to Japan again because I love Japan". We are waiting for YOU !

3. Activity in the world

“ Lao-Japan Waterworks Seminar” & “Project MaWaSU International Seminar”

Ms. Chinatsu Maeda
(Nihon Suido Consultants Co.,Ltd.)



Ms.C. Maeda

“Lao-Japan Waterworks Seminar” (November 19-20, 2014) and “Project MAWASU- the Second International Seminar” (November 20, 2014) were held in Vientiane, Capital of Laos.

There were 200 participants including the members of WaQuAC-NET (Ms. Yariuchi, JICA staff, Mr. Sugawara, the JICA expert in Jakarta, Indonesia, etc..) in each seminar.

“The Lao-Japan Waterworks Seminars” has been held jointly by Ministry of Health, Labour and Welfare, Japan and Saitama City Waterworks Bureau, which has been carrying out cooperation On waterworks in Lao for many years, as Japanese side. The word “MaWaSU” of “Project MAWASU International Seminar” is an abbreviation for “Capacity Development Project for Improvement of Management Ability of Water Supply Authorities” implemented by JICA.

<http://www.jica.go.jp/project/english/laos/012/index.html>

MAWASU also means “spin”, “pass”, “turn” etc. in Japanese language. The interim outcomes of the Project were reported at the Second International Seminar.

The government of Laos aims to achieve 80% of water supply coverage ratio in 2020. In order to achieve the goal, each water supply state enterprise is making efforts to develop human resources and to promote a public-private

partnership project with support from donors including Japan.

In both seminars, these efforts by Lao side and supports from Japan, and accumulated knowledge on

both waterworks management were reported and discussed. There were presentations from Ministry of Health, Labor and Welfare, Japan Water Works Association, Fuji Tecom, Inc., Nihon Genryo Co., Ltd., and Tohkemy Corporation as Japanese side, and Vientiane Capital Water Supply State Enterprise and Luang Prabang Water Supply State Enterprise as Lao side at “The Second Lao-Japan Waterworks Seminar”.

At the session on development of human resources, presentations and discussion were made based on the theme of that continuous human resources development is a basis of sound waterworks management. I reaffirmed that public and private partnerships are well functioned in the field of trainings in Japan and young people are brought up for waterworks in Japanese universities in collaboration with public and private sectors. I felt this situation rises to a sense of solidarity, represented by so-called "water family" in Japan and the collaboration between public and private sectors has developed Japanese waterworks.



I also thought many things at the session of the public-private partnerships. Currently, water supply projects by public-private partnership in Lao are underway in the association with China and South Korea to increase water supply ratio. However, it seemed there was a status quo that legislation and regulations couldn't catch up those projects. In case of Japan, the waterworks has developed based on the demarcation between public and private sectors and each role. I felt that Japanese waterworks become matured stage and have to establish new regime based on strength and weakness of each sector. From this point of view, it might be necessary to build appropriate PPP scheme for waterworks context developed in each country.

At the "Project MAWASU- the Second International Seminar", Japanese experts, WASRO (Water Supply Regulatory Office) of Laos, three water supply state enterprises of the pilot project (Vientiane Capital Water Supply State Enterprise, Luang Prabang Water Supply State Enterprise and Khammouane Water Supply State Enterprise) made presentations, which were also very interesting for me. As a consultant, I have been involved in JICA's technical cooperation projects and was able to obtain a lot of suggestions from their presentations and discussions. In particular, the project approach to encourage the C/P to rise their awareness and the reports by short-term experts to take over their outcomes to the next expert were very good references. I was also impressed to see the C/P enjoyed to make presentations on their activities and outcomes.

As I wrote the above, I learned many things from those two days seminars. Now, I have to utilize them for the water supply project I am currently engaged in. I would like to make an effort to prepare good F/S report to the best of my ability

based on the outcomes of the Japanese long-term cooperation to Laos.



P2P Meeting

In parallel to MaWaSU-second international seminar, P2P (Project to Project) meeting was held. P2P meeting is a place of exchange of opinions among the water utilities in south east Asian countries. Originally, it has started as the meeting for JICA water supply project of Laos, Cambodia and Vietnam. Since the third meeting held in 2013, theme is "brewing the culture to drink tap water". this time, in the fourth meeting, persons concerned water supply gathered from Laos, Cambodia, Thailand, Indonesia and Myanmar with JICA experts And they discussed and reported their activities for developing the culture to drink tap water. In the end, they declared 2014 MaWaSU statement and promised to carry out following 4 issues;

- 1 Providing good service to customers.
- 2 Implementation of WSP; Water safety Plan
- 3 Keeping clean the office and water supply facilities.
- 4 Strengthening the public relations including water education class

4. Activity in Japan

Report of WaQuAC-NET 2015 General Meeting

WaQuAC-NET General Meeting was held on January 30, 2015. Seven members, Mr. Sasayama, Ms. Oil, Mr. Umeyama, Mr. Horie, Mr. Sasaki, Ms. Yariuchi and Yamamoto joined. Activity in 2014 was reviewed and activity plan in 2015 was discussed.



*From left Mr. Sasayama, Ms. Oil, Ms. Yariuchi,
Mr. Umeyama, Ms. Yamamoto, Mr. Horie, Mr. Sasaki*

1. Review of activity in 2014

	Month/day	Activity	Place	Number of person
1	2/13	2014 General Meeting	Tokyo	7
2	4/22 - 5/20	Questionnaire survey to Japanese members		31 Answered
3	4/24	Welcome party for Cambodia mission (Ministry of Industry and Handcraft)	Tokyo	20 (5 Guests)
4	5/13	Support of water quality analysis for thesis of Cambodian student	Osaka	4 (1 student from PPWSA)
5	5/29	Encourage party for members who changed job and retired.	Kawasaki	8
6	6/30	Welcome party for Governor of PWA and Deputy Governor of MWA who participated in the 3 rd JICA Executive Forum.	Yokohama	11 (3 Guests)
7	7/3	Farewell party for Cambodia, Deputy General Director of PPWSA and Secretary of state, MIH who participated in the 3 rd JICA Executive Forum	Yokohama	14 (3 Guests)
8	7/16 - 7/30	Dispatched Expert to MWA for biological survey for water resources in central Thailand	Thailand	51(50 seminar participants)
9	7/28	Kyushu branch general meeting	Fukuoka	9
10	8/19	Dispatched Expert to MWA seminar on GLP (Good Laboratory Practice which is Japanese standard)	Thailand	36 (35 seminar participants)
11	9/5	Osaka meeting on arsenic pollution in grand water	Osaka	25
12	10/15	Meeting on review of 3 rd JICA Executive forum	Tokyo	5
13	10/24 - 11/2	Making the report of biological survey with 2 MWA staffs	Tokyo/ Yokohama	5 (2 from MWA)
14	11/7	9 th mini-meeting on result of biological survey	Tokyo	7
15	12/22	Year end party	Tokyo	9

2. Activity Plan in 2015

1) Publication of Newsletter

English version: 4 times (Mar. Jun. Sep. Dec.)
Japanese version: 4 times (Feb. May. Aug. Nov)

2) Meeting, Seminar

- General meeting: January 30 (was held)
- Kyushu branch general meeting: July
- Osaka meeting: September
- Discussion meeting to look back on the 3rd JICA Executive Forum for Enhancing Sustainability of Urban Water Service in Asian region.
Theme: Procurement: April
Meter maintenance: May
WSP (Water Safety Plan): August
Non Revenue Water: November
- Comparing Asia and Africa in water supply development (not yet fixed)
- Report for result of biological survey on water resources in central Thailand: November

3) Dispatch of expert

An expert of biology to MWA for biological survey on water resources in central Thailand :
March, July, November

4) Welcome party and farewell party

Farewell party for Ms. Oil: February 28

5) Others

- Arranging Q&A for easy reading
- Improvement of homepage
- Interview to overseas members about WaQuAC-NET activity
- Monitoring the restoration in damaged area by East Japan great earthquake
- Recruitment of oversea new members
- Collection of information on African situation of water supply

The party

2014 year end party was held on December 22 at Shinjyuku, Tokyo. Nine members enjoyed talking and drinking.



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WaQuAC-Net Office

E-Mail: waquac_net@yahoo.co.jp (Yariuchi, Yamamoto)

URL: <http://www.waquac.net>

Next Activity

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| Apr. 2015 | Discussion meeting to look back on the Executive Forum |
| May 2015 | Newsletter vol. 25 (JPN) |
| Jun. 2015 | Newsletter vol. 25 (ENG) |