WaQuAC-NET Newsletter
Water Quality Asian Cooperation Network
http://www.waquac.net/english/

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For Safe Water, Do Network.

WaQuAC-NET Newsletter vol.30 CONTENTS

1. Technical Q&A

Question & Answer Corner

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

Q: We faces difficulties to reduce thief of water (illegal connection). Please tell us effective countermeasures. (Mr. M.O. Nigeria)

ENCOUNTING ILLEGAL CONNECTIONS IN PHNOM PENH, A LESSON LEARNED

In 1990's the water loss in Phnom Penh city, the capital of the kingdom of Cambodia, has been raised to about 70%. Illegal connections have been playing a big role; one case a day, in average, has been reported.

To tackle this problem, Phnom Penh Water Supply Authority (PPWSA) has applied the following measures:

1. INCREASE THE SERVICE PRESSURE. PPWSA has increased its service pressure from 0 to about 3 bars by the year 2000 by replacing the old leak pipes and increasing the production capacity. The benefit of raising service pressure:
   a. Easier to detect leaks. High pressure surges the sound of leak and the leak often comes up to above the ground which will be seen easily. Disadvantage: loss more water if the leak flows into drainage, need careful search and detection.
   b. Non-skill person cannot tap the pipe. To tap a high pressure pipe (>1 bars) need skill personal and proper equipment.
   c. Customers in the high floors are happy with our service, enough water.
2. PROPER PIPE MATERIAL. PPWSA is using only 2 types of pipe, transmission mains from DI, 300mm up, and distribution mains from HDPE, 225mm down. All pipes shall be laid at least 0.5m below ground. To tap the pipes requires deep digging, appropriate fittings and skill.

3. LOCATION OF WATER METER. To make easy access for meter reader as well as protection against thief, the meters shall be located near entrance gate or in the front of customer house.
4. EDUCATE OUR PERSONNEL. Only the skilled personnel can tap. Therefore PPWSA staffs have to commit not to join, but to fight against illegal case. They have been encouraged to report any illegal actions by award. Strict penalty have been applied, if anyone join, he/she will be fired and, additionally, could face the case at the court.
5. EDUCATE OUR CUSTOMERS. Good moral have to bring back. Customers have to know their duties, to pay what they consume and not to steal. We encourage them with award to report about any suspect.
6. APPLY STRONG PENALTY. Immediate action when received report. Strong penalty have been applied. The unsolved case will be sent to the court, and some time we do need cooperation with media, mainly TV, to show up the case.
7. ACTIVE MONITORING AND FIXING THE LEAK. The whole service area has been divided in DMA zones and sub-zones. There are 3 main activities:
   a. Night flows are monitored. Night step test will take place if any high night-flow.
   b. Routine checking by water-loss-team, using listening bar mainly.
   c. Stand-by teams immediate fix the leak, less than 2 hours after received information.

Nowadays, there is rare illegal connection, one to two cases a year have been reported.

Answered by
Dr. Chea Visoth, PPWSA

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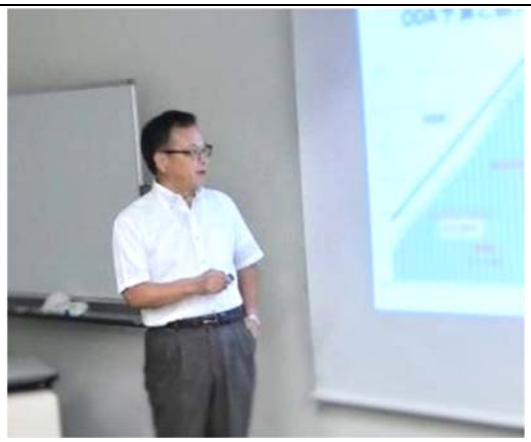
The 2nd Meeting on Water in Africa
Experience of Mr. Uemura in Africa

June 24th, 2016, 2nd meeting on Water in Africa was held at the meeting room in “Earth System Science Co.,LTD (ESS). A lecturer is Mr. Mitsuro Uemura who is a senior engineer of ESS and a member of WaQuAC-NET. Mr. Uemura has a lot of experience of water issues in not only Africa but also Asia and Latin America as a consultant, staff of well drilling company, JICA expert and so on. Recently, he has been working for the JICA technical cooperation project of human resources development for water supply in Sudan, Africa as a leader. From March, 2016, newly, JICA project has started in Sudan and he assigned as a leader again.

He undertook willingly our offer to present even though he was busy for having just returned from Sudan. The lecture was based on his experience. And it took for 3 hours. Participants were WaQuAC-NET members, staff of ESS, staff of JICA, official of Ministry of Foreign Affairs and people interested in water sector and Africa. Total numbers were 27. After meeting, a buffet - style party was held and participants enjoyed talking. This seminar became one of the big events among WaQuAC-NET meetings.

1. Outline of Lecture

Lecture was composed of ODA projects which he concerned, Japanese international assistance, Sustainable Development Goals (SDG), basic information of geological features, geographical features, water resources in Africa, Water situation in Sudan and Morocco and past project and existing one in Sudan. Here, space is limited, so I focused on water situation in Sudan.



Mr. Uemura lectures on water in Africa

“Project for Human Resource Development in Sudan” started for establishing the training system for staffs of state water corporations in 2008. It ended in September, 2015.

This year, new project which is “Project for Strengthening Capacity of Institutional Management, Operation and Maintenance in State Water Corporations” has started. It will plan to complete by 2020.

There is different scale of water supply systems from large to small in urban area in Sudan. And many systems are deteriorated and some water corporations supply water without any treatment. In some cases, turbidity is 200 NTU around in tap water.

Tariff is flat rate. Because of old asbestos cement pipes and delay of pipe replacement, leakage rate is so high.

Financial situation of all state water corporations (SWC) is not sufficient. Therefore, SWC cannot invest for new facilities. Their situations are in negative spiral.

So far, Mr. Uemura has founded training system steadily for the drinking water using groundwater and has developed human resources in Sudan. He set up concrete training program in Morocco. It has good water supply utilities and training system. Around 50 Sudanese participated in Morocco training in order to enhance their awareness. As a result, they change their awareness little by little.

In new project which has started this year, Japanese experience of maintenance will be introduced. It is water supply support system by users in Yahaba Town (Iwate prefecture, Japan). By activating dialogues between SWC and end users, SWC expects that users will be interested in water supply, and discuss what the sustainable water supply is. The project will promote public relaion acvitities to get their users to tnink how will their grandchildren and great grandchildren get good water service.

Participants listen eagerly.

2. Conclusion

At the end of lecture, Mr. Uemura mentioned that linkage among neighbor countries for human resources development will become important. He also mentioned strongly that assistance of graduation (finish assistance) from developing countries is essential. And he concluded that it is indispensable for development of country that developing countries improve basic infrastructure and make easy for private companies to advance into there for new business.

【Afterword】

Ongoing project is implemented by ESS and Mr. Kagata who is a member of WaQuAC-NET and former staff of Kitakyushu Water Works Bureau will join to the project. I will join too. It is a very precious occasion for me to work with Mr. Uemura and Mr. Kagata. I feel some curious coincidence in this project.

Temperature of Sudan is over 45 ^{o}C in hottest season. It’s a harsh environment that exhausting just to move. I respect Mr. Uemura who is working

for many years in such a sever conditions for human resources development. Sudan people related water supply trust him very much. As Ms. Yamamoto said in beginning, “Mr. Uemura still keeps boy’s mind”. He works energetically anytime with sparkling eyes. I thought all participants might become his fan after this meeting. I wish more and more of his success in the future and I hope he supports to improve water supply situation through JICA technical cooperation in Sudan.

In final, on behalf of WaQuAC-NET, I would like to describe my appreciation to ESS for preparing meeting room, drink and snacks. For staffs of ESS, thank you very much for helping many works for holding the meeting and party,

For President of ESS, I express my gratitude for accepting all and final remarks.

(Mr. Toshiki Horie)

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～Introduction of Project～
Project for Improvement of Water Supply Management of YCDC in Myanmar

Mina Yariuchi (JICA Expert)

【Overview of YCDC】

Yangon, the largest city of Myanmar with a population of about 5.2 million, has drawn attention increasingly in the business and tourism after the transition of political system to civilian government in 2012. Water supply in Yangon is the responsibility of, and directly operated by "Yangon City Development Committee (YCDC)", equivalent to municipal administration of Yangon City. Overview of the operation is as shown in the table below. The water supply in Yangon has many issues in service despite its long service history and such a large-scale city. Only about 1/3 of the total supplied water has been treated although the water source is mostly surface water[1].

Water Supply by YCDC

Supplied Water (est.):	930,000m3/day
Coverage ratio (est.):	About 35 %
Non-revenue water ratio (est.):	About 66 %
Staff number:	About 2,000 staff
Supply hour (average):	8 hours/day
Water tariff (domestic):	USD 0.08/m3
Service operated:	since 1842

【Outline of the Project】

I have worked for “the Project for Improvement of Water Supply Management of YCDC” supported by JICA and implemented for 5 years since 2015, under cooperation with EDWS (Engineer Department (Water and Sanitation)) of YCDC. The Project aims to improve capacity of YCDC on the management of water supply service, with 3 components; 1) institutional aspects including planning & monitoring, financial management, regulations & standards, human resource development, and customer service & PR, 2) non-revenue water management including both of commercial and real loss, and 3) water treatment and water quality monitoring.

【Recent activities】

I am in charge of “Institutional Capacity Development/Human Resource Management” in the Project. Here, I would like to explain current situation and recent activities briefly.

Myanmar people trends to be diligent in learning. However, the country had been isolated internationally for a period, and major national universities had been closed due to political reasons, so the higher education of the country has had difficulties. In addition, staff of YCDC is a civil service, and has to stand at non-permanent staff

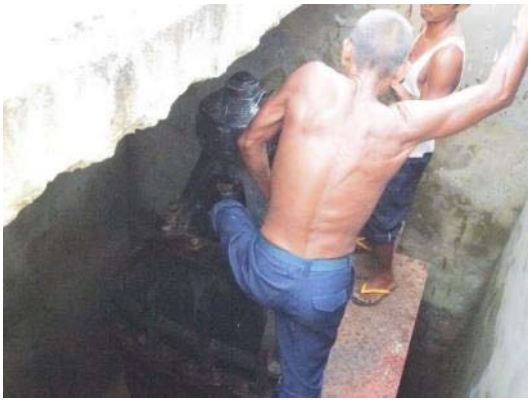
[1] Detail information of situation of water supply in Yangon, please refer to Newsletter Vol 12 (2011), and Vol 26 (2015).

for years with poor employment conditions to be employed officially. Therefore, turnover rate of staff is quite high. In order to expand service scale rapidly, and realize to improve service quality, human resource development has become an urgent need of the organization.

Through the Project, we have made a survey of the current situation, and discussions on the solving approaches. We plan to discuss how human resource management and development can support implementation of business expansions, and compile as a HRD plan. Currently, to produce a visible change, we began a training course for new staff. The first training course was conducted for engineers in June. Some participants said “it was my first experience to visit a treatment plant in my 2 years’ working experience in YCDC”. Till now new staff has few chance to attend a training. The project, however, plans to support for establishing it as a periodical training, so as to cover all newly employed staff; about 200 staff every year, which can provide new staff occasions to understand overview of water supply management as well as systems.

In present, YCDC has a lot of issues to be improved on water supply service. Towards its improvement, YCDC plans some projects including loan projects for rapid business expansion as well as capacity development of staff by this project. On top of everything, ownership and self-effort of YCDC can be said as the key factor for the steady progress. In this regard, awareness seems to have been raised at the top management level, and staff has been activated and empowered through project activities, so I expect that the improvement of management and services can appear visibly in 4 years, at the end of the Project.

Confirmation of printed bills



At a valve near a pumping station. It takes 45 minutes to open/close a valve manually.

Young staff made questions eagerly at WTP during a training course

With YCDC staff
(The second from the left is Yariuchi)

◎Introduction of New Member◎

Ms. Nguyen Trang

Living in Kobe, Japan, from Vietnam

Hi everyone.

This is Trang from Vietnam. I'm now working as a water engineer at Kobelco Eco-Solutions in Kobe, Japan.

There was just a line to let people know about WaQuAC-NET at a group meeting of Kobelco, I started googling WaQuAC-NET.

Whoah! Unbelievable! Tons of real projects and researches have been posted on the website.

It seems that members are very kind and they are willing to share their own experience, knowledge to each other. How nice! That's my very first impression on WaQuAC-NET. Therefore, I'd love to become a member of this network.

One day, an email from Ms. Yamamoto of WaQuAC-NET, suddenly came to my inbox. Guess what, she said she wanted to see me. WaQuAC-NET members were truly nice I thought.

We spent time enjoying Vietnamese cuisine together. How amazing is Yamamoto. She is a warm-heart but strong-mind expert whom you should meet. Such a good person like Yamamoto will teach you and especially, burn the light in your heart, I strongly believe.

Even there've been many problems with the water treatment, sure we can work together to make the earth a better place to live, to bring the clean water to everyone in the world.

So please feel free to contact me anytime, when you need assistance of any kind, or feel like having a word. Here is my contact address:

Email: trangntt.8x@gmail.com

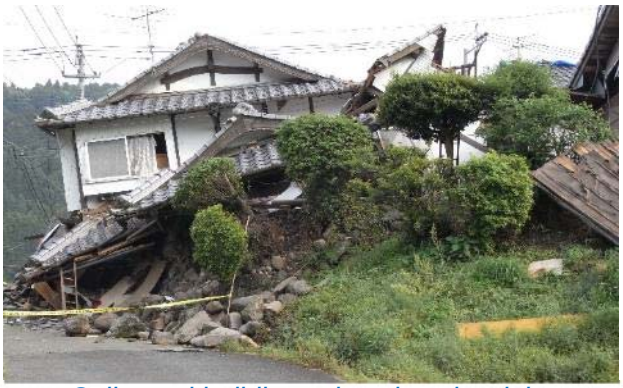
Kumamoto earthquake Report

- Impact of earthquake with seismic intensity 7, and 2 barrage -

Arimura Gensuke
(Water supply network communication)

On April 14, at 21:26, earthquake of M 6.5 occurred at 11 km depth in Kumamoto area, and 28 hour later, on April 16, at 01:25 am, another earthquake of M 7.3 happened in the same area of Kumamoto Prefecture.

The first earthquake recorded the seismic intensity 7[2] in Mashiki Town, and the subsequent recorded the seismic intensity 7 at Nishihara Village and Mashiki Town of Kumamoto.



Collapsed buildings show how hard the earthquakes was (Oyatsu District, Mashiki Town)

Although almost three months has passed since then as of July 9, about 5,000 people have been forced to be evaluated in 94 places of 16 municipalities. Most collapsed buildings have not been removed yet, still remains as the tragic figure of as it is.

[2] Seismic intensity: Earthquakes are measured with two kinds of scales: scales of the magnitude of the energy released by the rupture (=Magnitude scale), and scales of the intensity of the resulting ground shaking at a given location (=seismic intensity scale). Magnitude scale shows power of the earthquake at epicenter while seismic intensity differs from measuring locations for one earthquake.

I had a walk in the disaster area on May 7 and 8; 3 weeks after the earthquake. While recognizing that the reconstruction is in progress, scars of severe disaster have been left everywhere, and I realized that there are many challenges differing from the past earthquakes.

Completely different phenomenon with the past earthquakes

Japan Meteorological Agency initially announced that the main shock of the earthquake was one of April 14 and warned possibility of strong aftershocks. However, after a strong shake on April 16, it corrected that the shake on April 14 was a foreshock, and the shake on 16th April was the main shock. Before this time, there were some cases that the Agency has corrected the initial announcement to interchange between foreshock and main shock, but it was the first case of correction in inland type (direct-type) earthquake. Also the earthquake with maximum seismic intensity 7 occurring in succession was the first case.

The "seismic intensity 7" was newly added to the seismic intensity scale of the Japan Meteorological Agency in 1949, the following year of the Fukui earthquake. Since then, there had been no earthquake recording seismic intensity 7 for 46 years till the Great Hanshin earthquake occurred in 1995. However, there have been often observed of earthquakes of seismic intensity 7 for 21 years since "Hanshin". It shows the Japanese archipelago has entered the active period of the earthquake.

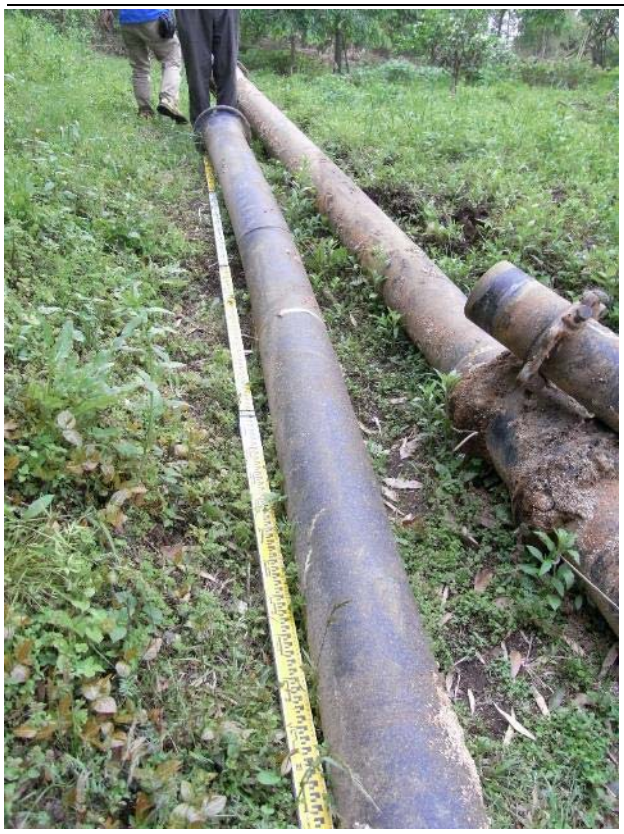
Moreover, Kumamoto earthquakes recorded twice of seismic intensity 6-upper, 3 times of seismic intensity 6-lower by May 14. In addition, the number of all earthquakes (more than intensity 1) reached more than 1,500 times accumulated from April 14 and May 19, and 1,827 accumulated times by June 30. According to the Japan Meteorological Agency, the aftershocks occur unusually fast pace. Niigata Chuetsu Earthquake (2004), which observes more aftershocks than usual, took a year to reach 1,000 times of aftershocks.

This earthquake differs from the “typical” of the past in various points, the damages were significantly different from the past. The most structures that were able to stand the shakes of April 14 did not withstand a main shock on April 16 to be collapsed. In 2009, the concept of earthquake resistant design was revised, and the design concept called "level 2" was newly introduced, which requires an earthquake resistant performance for important structures as "damage to important structures shall be lessened, and be able to be repaired immediately". However, facilities, buildings and housings were able to withstand the first shocks in Kumamoto earthquake, suffered damage to collapse in the following main shock, which causes to expand the damages.

It posed a difficult problem for water supply and sewerage facilities. This phenomenon is not only about aboveground structures of facilities but pipelines, which account for 70% of the assets of utility. Earthquake resistant joint ductile iron pipe has been considered to withstand the ground motion by its chain structure with a detachment prevention mechanism. Polyethylene pipe is a new earthquake-resistant pipe has been considered withstand ground motion by its flexibility. Until now, there was no discussion what would happen when the earthquake of level 2 has occurred repeatedly. Before that, it is going to be discussed whether it is necessary to make consideration of such conditions into earthquake resistance of the pipe.

NS joint ductile iron pipes is water leakage

On pipeline damage, leakage was found on ductile iron pipes (DIP) with NS joint, it is deemed as earthquake resistant pipe. The location was in Nishi-ku of Kumamoto, where maximum seismic intensity was 6-upper. The pipe was D300mm and



Damaged DIP of D200, and D150 (K type)
(Mashiki Town, Fukuda District)
Distortion of the pipe shows how large stress put on the pipe

installed in 2011. The leakage point was the junction of the 45-dgree bend with straight pipe. It was said that it was due to mistake or improper installation. If so, the responsibility of the leakage may come to a constructor. In addition, the discussions may extend to possibility to find leakage during a pressure test at installation inspection, moreover, the way of a water flow test itself.

On the other hand, some said the leakage was inevitable or unavoidable because the location was very difficult site to construct and the point was a joint of the 45-degree bend.

Disjointing of not only A-type mechanical joint but also K-type mechanical joint were found in the affected areas. It is inevitable to disjoin when the applied force to a pipe exceeds a design value. Even under such a situation, DIP itself was not damaged at all, which can prove toughness of the DIP. Jointing of earthquake resistance DIP bend requires installation skills. The requests have been made to improve easiness of the installation. The manufactures are being demanded to improve on this aspect.

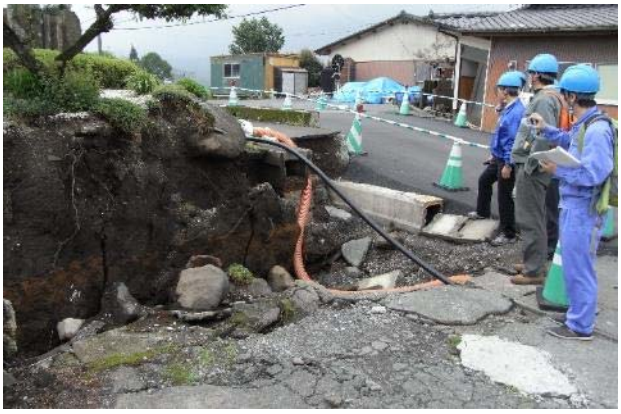
Area of many PE pipe installed

One of the characteristics of this affected areas is that polyethylene (PE) pipe has been often installed for distribution pipe. Although PE pipe has been used in Europe for long, it has been still new material in Japan. In the Great Hanshin Earthquake (1995), PE pipe attracted attention because PE pipe was less damaged, that had been used as a gas pipe. Since then, it has rapidly spread and expansion by standardization of Japan Waterworks Association. It has been deemed as the earthquake-resistant material with its flexibility. In the Chuetsu Earthquake (2004), the Chuetsu-oki earthquake (2007), and the Great East Japan Earthquake (2011), earthquake resistance of PE pipe has been proved, but the total length was not long enough. Therefore, PE pipe is regarded as earthquake resistance material still “with conditions”; the application of PE pipe has been left to each utility’s judgement.

In the affected areas of Kumamoto earthquake, PE pipe has been installed as long as 13 km in Mashiki Town, 85 km in Kumamoto City, the severely affected area as “Level 2”, and more than 120 km in total in the severely affected area, and more than 600 km in Kumamoto Prefecture. According to the interview survey till now, there is no leakage from PE pipes including fittings (electrofusion) and main pipes.

Surface faulting appeared in Kario District, Aso City

We can see how largely active fault moved in Kario District, Aso City. It locates more than 42 km far to the east-northeast from the center of Kumamoto. There is the fault of 40 ~ 50m wide and 1 km long crossing Prefectural Road No. 175. This fault



(Upper and lower) Surface faulting appeared in Kario District, Aso City. Faulting was 40～50 m wide, 1.6～2.1 m of displacement height, and 1 km long in total.

became well-known at an early stage from the earthquake by "tweet" on Twitter, pictures posted on the Web. On May 7 when I visited there, the faulting had become a paved slope with asphalt in order to ensure the passage. According to the posted pictures on the web taken immediately after the quake, the road looked like to be scraped off by a giant ax, and a ladder was subjected. Depression height was 1.6 ~ 2.1m. A house facing the prefectural road in remained as it was at the time of the quake occurrence; part of the building had been up float in the air. And PVC pipe was laid in this area, and of course, disjoined. Water is supplied to the residents by temporarily installed PE pipe.

Faulting crossed a farmland, and came to Kaibara Bridge over the Otohime River, where a distribution iron pipe of D 80mm hang to the bridge disjoined which disjoined a distribution iron pipe of D 80mm hang to the bridge.

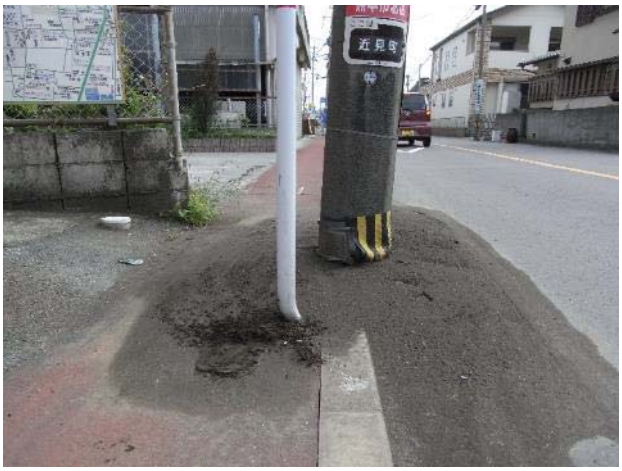
Horizontal faults of 2m

In the affected areas of Mashiki, it is too horrible to look at collapsed houses as far as the eye can reach. I saw the horizontal faults of 2m in the Mashiki. A line, looking like digging by something, crosses the paved road from a cliff of a hill to a bank, and the wheat field, continuing all the way to the far. Wheat field looks as if they were mowed to arrange the strip. It was the site of the strike-slip. Though a horizontal fault cannot be clearly seen at the ground or roads, it appears at wheat field with its strike-slip clearly. And, a great number of houses collapsed at a distance.

Horizontal faults appeared in Mashiki Town. 2 m of horizontal displacement clearly remains.

Situation of liquefaction area in Kumamoto

I made a survey in Minami-ku, Kumamoto. Even though 3 weeks has passed since the earthquake, I could see still traces of jetted sand here and there. Unlike the area where the buildings collapsed in intense ground motion, the damage of this area seems not to be too severe at a glance. However, there are tilted houses, and it will be difficult how to restore the tilted house. Due to the liquefaction, houses and utility poles are tilted not to the same



Situation of liquefaction in eastern Kumamoto City. The sign on the utility pole shows displacement depth.

direction, but to the pulled direction respectively by liquefaction. There is a telephone pole which has sunk vertically almost 80cm depth.

Anytime, anywhere, an earthquake occurs.

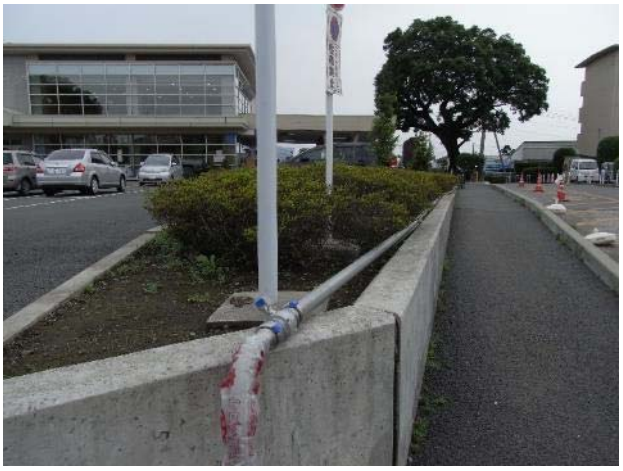
The Japanese archipelago, especially western Japan, was said to have entered the active phase of the earthquake since the Great Hanshin earthquake (1995). And after the Great East Japan Earthquake (2011), it is obvious that the entire Japanese archipelago is in the active phase of the earthquake. Needless to receive experts' indications, people are keenly aware of it through recent frequent occurrence of earthquakes. There is a problem today, that this recognition is not well penetrated as common. Let me introduce one case.

After the Great East Japan Earthquake (2011), a simple water quality test kit has been developed to determine the quality of water supplied is potable or not in emergency. (Product name is "Water ResQ"). In the emergency, Water quality testing is essential for securing health and living environment of the victims. However, putting this equipment in place to get ready for emergency, has shown a large difference among regions. Readiness to the earthquake damage such as symbolized by the introduction of "Water ResQ", utilities in Kyushu[3] are quite dull as a whole. The reason is that "because there is no earthquake in Kyushu."

How on earth can you be sure? It is hard for me to understand. The same words had been repeatedly referred until "Hanshin (1995)". It says "there is no earthquake in the Kansai region." We should firmly keep in mind again that there is no area in Japanese archipelago where no earthquake occurs, nor the region to live in peace without earthquake. In particular, the administrative officers, lifeline operators regardless of the public and private sectors are a strongly demanded for a commitment to anti-earthquake measures. This is a social mission.

Software is important but …...

Some people say that the establishing infrastructures has limitation to cope with the huge natural power, therefore, it is necessary to establish the "SOFT" system that can realize quick recovery after a disaster. Since it is not feasible to continue strengthening the structures unlimitedly so as to withstand any earthquake, I agree with the opinion that we should enhance intangible system. However, I strongly feel that enhancing earthquake-resistance of structures is more



Temporal water service pipe supplying to the Mashiki Health and Welfare Center, temporarily used for an evacuation shelter.

[3] Kumamoto is located at center of the Kyushu Island.

Rehabilitation work of transmission pipe D1350mm in Ezumachi, Kumamoto City

important than anything else, as standing in front of miserably collapsed residences. “HARD” and “SOFT” systems are strengthened not on the contrary, but should in parallel. Though I think so, it is obvious that strengthening earthquake-resistance of structures including residences is the most effective measures to save human life from earthquake. We can start the above discussions only after structures especially residences realize to some extent earthquake-resistance. I hope experts’ discussions on how is the ”to some extent” earthquake-resistance.

Here, I omitted explanation on support to the earthquake in Kumamoto, there have been activities by water supply utilities and private companies including pipe installation companies.

Activity Report: The 8th Assemble meeting of Kyushu Branch

Keiko Yamamoto
(WaQuAC-NET Office)

The 8th meeting of WaQuAC-Net in Kyushu was held on 24th July. From the 1st to 3rdmeeting, mainly several members managing water related small business joined, and discussed joint venture business in abroad, which was a quite unique meeting in WaQuAC-NET. But recently, they found it is difficult to go abroad together, so they exchange and share information their own business and activities.

3 years ago, Mr. ODA who had worked in Fukuoka City Waterworks Bureau (FCWB) joined us, presented his activities in Fiji as a JICA Senior Adviser.

His activities stimulated Fukuoka’s overseas cooperation since then, and it was explained in WaQu-AC’s meeting in Osaka last year.

After experience of JICA expert in Malaysia on his 40’s, he had no chance to work for international cooperation. However, he started to contribute for international cooperation again after retiring. His action encourages other members attending the meeting very much, and it was impressed that young staff in Fukuoka has wills to join the activities recently.

This year’s meeting was attended by Mr. NAKAJIMA, Mr. KAGATA, Mr. ODA, Mr. TAKEBE, Mr. AKAISHI and Ms. YAMAMOTO.

The first topic was Kumamoto earthquake (occurring in April 2016), and their activities. The points are as follows.

- ✧ Two strong earthquake attacks damaged much infrastructure including water treatment plant and pipeline.
- ✧ A lot of water resource of Kumamoto water supply is pure ground water, but earthquake caused high turbidity of ground water, so some private companies provided water treatment unit.
- ✧ Just after the earthquake attack, many aid materials and products were collected in the central park in Kumamoto, but they could not deliver them from there to people because logistics system was destroyed and heavy traffic

jam occurred.

So several weeks later, logistic company collected them in neighboring cities, for example Kurume located in the southern area of Fukuoka Pref., and delivered free of charge from there to Kumamoto without traffic jam in the central of Kumamoto.

- ✧ Information about this earthquake has been provided less than the Great East Japan Earthquake (2011). Even in Fukuoka, closely located to Kumamoto, only a little information was conveyed.
- ✧ Association of Water and Sewerage Works Consultants Japan (AWSCJ) made agreement to cooperate with Kumamoto City and Mashiki Town, closely located to Kumamoto, for engineering assistance for water and sewerage, and investigated infrastructure damaged there.
- ✧ Japan Sewer Collection System Maintenance Association (JASCOMA) also cooperated to rehabilitation. One member said AWSCJ and JASCOMA should be going to cooperate together.
- ✧ One member said much mass media partially causes traffic jam and many trouble, so they should make their association and coordinate among companies to avoid such troubles.
- ✧ Japan Plumbing Heating and Airconditioning Constructor's Association cooperated to rehabilitate water supply system from head office and Fukuoka branch, but it was difficult for them to do together because the contents of procedure specification for construction of Kumamoto city was different from others.
- ✧ Japanese ministry cannot cooperate among them smoothly for their vertically segmented administration. Japan should establish a ministry of emergency situation holding powerful authority like U.S.
- ✧ Since temporary housing requires many Jokaso (septic tank) immediately after earthquake, Jokaso was not enough for general customers. Especially, constructor to install it in housing was not secured.
- ✧ At the earthquake, measure to deliver water for domestic use including washing toilet quickly is more important than drinking water, because people can get it with bottle.
- ✧ One member said convenience stores, delivery systems and vending machines are useful at the earthquake.

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Each member reports as following,

<Mr. ODA> JICA project in Fiji for water leakage control has been implemented for 3 years and will finish in the next year with budget of 55 million yen. Now he considers next activities after this project. Fukuoka Waterworks Bureau has assigned an expert to Myanmar till now, so it is difficult to make further activities to Fiji.

<Mr. KAGATA> He has conducted training on operation and maintenance of WTP in Battangbang city and Kompong Cham city, Cambodia as JICA project. This project is to build 2,400m3/d WTP in Battangbang, and 1,400m3/d in Kompong Cham respectively, but the construction of plants have not been completed when he provided training. So he said it was so difficult to teach Cambodian technicians without plants. Besides, he will go to Sudan to teach O&M of WTP which takes raw water from the Nile River and underground as JICA project.

<Mr. TAKEBE> His company conducted simple water supply system experiment in Vietnam. This project invited Vietnamese people for public experiment, and was appreciated well. Next time, he continues the experiment with other water resource.

<Mr. AKAISHI> In this year, one private company project to water supply temporally (20m3/d) in rural

Cambodia finished. He assisted it and now he works for a Jokaso manufacturing company as a product development engineer.

<Mr. NAKAJIMA> His company had supplied some materials for water supply in Cambodia, but abandoned and closed a branch office there because Chinese companies has been advancing its business.
Now he joins business to make rehabilitation for water in Kumamoto.

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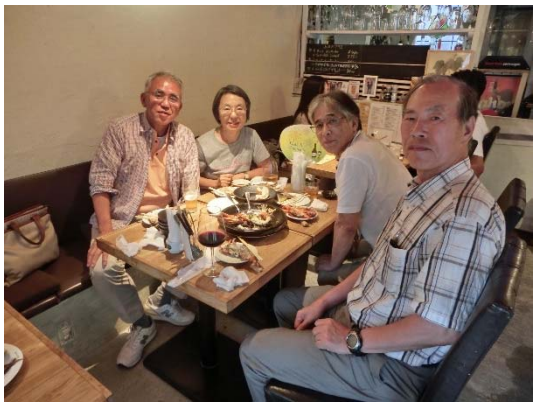
After the meeting, 4 persons made gathering in "Natural Bal Bouda" restaurant that Mr. ODA's son runs in central area of Fukuoka city, Tenjin area.



(From left) Mr. Takebe, Ms. Yamamoto, Mr. Nakashima, Mr. Oda

Kumamoto Earthquake Information Memo

1. Situation of Earthquake (April 14 - June 14, 2016)

Seismic Intensity (SI) 7: 2 times、 SI 6 upper: 2 times、 SI 6 lower:3 times、
SI 5 upper:4 times、 SI 5 lower:8 times、 SI 4:89 times、 SI 1～3:1717 times

2*. Damage (April 14～August 1 cumulative total)

The number of deaths 64、Severely wounded person 604, Completely destroyed houses 8,549,
Partially destroyed houses 27,728, Evacuation place 68, 3,229 persons (up to 31/July)
Maximum evacuation place: 855, 183,882 persons (April 17)

3. Water Suspension

Maximum 7 prefectures 34 municipalities、Maximum connection:445,857、
Restoration rate(up to 7/June):99.9%
Maximum Water Suspension in large municipalities

Kumamoto City	326,873 connections	(suspending period	April 21 - April 30)
Mashiki Town	11,000 connections	(〃	April 14 – May 12)
Mifune Town	6,590 connections	(〃	April 14 – May 23)
Nishihara Town	2,652 connections	(〃	April 16 – May 25)
Minami Aso Town	3,503 connections	(〃	April 16 – June 7 33 connections)

＊up to July 28 suspension 0 (Except completely destroyed houses)

4. Supporting situation

Emergency supply (Maximum April 28)
84 Waterworks Bureaus from Kyushu, Chugoku-Shikoku, Kansai, and Chubu supported
96water trucks, 287 persons dispatched

Emergency rehabilitation(Kumamoto City : May 5 Maximum day,
Other municipalities :May 7 survey day)
All over Japan 62 Water works Bureaus、555 persons dispatched included staffs of pipe construction companies.

(Source: 1, 3, 4 quoted from "JWWA Measures for Kumamoto Earthquake in 2016 (Summary)"
2*1, ＊ quoted from "Information of Protection against Disasters by the Cabinet Office, Damage Situation on Earthquake occurred in Kumamoto area in Kumamoto Prefecture (August 1, 12:00)

(By Ms. Yamamoto, WaQuAC-NET Office)

Introduction of new members

- Mr.Robertson C.Chella (Zambia)
- Ms. Yukiko Ohno (Japan)
- Ms. Haruka UNO (Japan)

We welcome new members anytime
Please contact us

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URL: http://www.waquac.net

Next Activity

Early Nov.	MWA members visiting Japan
Dec. 10	Newsletter 31 in Japanese
Jan. 10	Newsletter 31 in English