

7. 付属資料

7.1 現地セミナー資料

第1次現地業務時にMCWDより、本プロジェクトの各部門に関するセミナー開催の要望があり、第2次現地業務期間中(2012年6月19日)に開催した。

目 次

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浄水処理・水質管理	7-4
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Technical Assistance on Water Supply Operation and Management for MCWD

Seminar Material

June 19, 2012



**Metropolitan Cebu Water District
Yokohama Water Co., Ltd.**



Technical Assistance on Water Supply Operation and Management for Metropolitan Cebu Water District: The second field operation

Date: June 19 (Tue) Time: 9:30 - 15:00 At: MCWD Training Room (6F)

No.	Time (Min.)	Title	Speaker	Remarks
1	9:30 - 9:40 (10)	Opening Address	Mr. A. Parades (MCWD) Mr. Y. Nagai (YWC)	
2	9:40 - 10:30 (50)	Presentation-1 Introduction of Water Purification method in Yokohama / Flocculation, Filtration Washing	Mr. K. Kojima Mr. S. Takahashi (YWWB)	
3	10:30 - 10:50 (20)	Coffee Break		
4	10:50 - 11:30 (40)	Presentation-2 Demonstration movie of Leak Detecting for Plastic Pipe (PVC, PEP)	Mr. K. Nakanosono (YWC)	
5	11:30 - 11:45 (15)	Question & Answer		
6	11:45 - 13:00 (75)	Lunch Time		
7	13:00 - 13:45 (45)	Presentation-3 Introduction of Digital mapping system	Mr. K. Yokoyama Mr. K. Kobayashi Mr. Y. Masago (Kokusai Kogyo Com.)	
8	13:45 - 14:15 (30)	Presentation-4 Sustainable Water Service Management - Yokohama's effort of Business Plan / CS / PR -	Ms. A. Takeuchi (YWWB)	
9	14:15 - 14:40 (25)	Presentation-5 Introduction of PI and BM for evaluation Toward 24hours water supply	Mr. K. Yokoyama (YWC)	
10	14:40 - 14:55 (15)	Question & Answer		
11	14:55 - 15:00 (5)	Closing Address	Mr. Y. Nagai (YWC)	

Introduction of Water Purification method in Yokohama

Kazuhiro KOJIMA (Mr.)
Water quality div.
Shunsuke TAKAHASHI (Mr.)
Western area construction div.

Contents

- Jar test
- Rapid mixing / Slow mixing
- Surface washing / Back washing
- Rehabilitation of filter medium

Jar test

- Information of sample (160NTU with Kaolin)
- Test condition
 - Case 1 (comparison)
 - Case 2 (Rapid mixing only, PAC=10mg/L)
 - Case 3 (Rapid mixing only, PAC=20mg/L)
 - Case 4 (Rapid and **Slow mixing**, PAC=10mg/L)
 - Case 5 (Rapid and **Slow mixing**, PAC=20mg/L)

Jar test



condition



Slow mixing 5min



Rapid mixing 2min



Result Raw water 160NTU
PAC 20mg/L Rapid only 16NTU
PAC 20 mg/L Rapid & Slow 3NTU

Rapid mixing / Slow mixing

5

- Aim
 - Rapid mixing : To diffuse coagulant uniformly
 - Slow mixing : To enlarge flocks
- Type of mixing energy
 - Natural energy (ex. Baffle)
 - Mechanical energy (ex. Flash mixer)

5

Rapid mixing / Slow mixing

6

Mechanical



Flash Mixer



Cross Flow Paddle type Flocculator

Natural



Vertical Baffle type Flocculator



Horizontal Baffle type Flocculator

6

Surface washing / Back washing

7

- Aim
 - To remove turbid substances which retained by filter medium
- Role
 - Surface washing : Smash flocks adhered to filter surface with water jet
 - Back washing : Discharge flocks from filter medium with ascending flow

7

Surface washing / Back washing

8



(01'00'') Surface Washing start



(04'00'') Back Washing only



(02'00'') Surface + Back Washing start



(10'00'') End of Washing

8

Rehabilitation of filter medium

9

- Problems with the lapse of time in filtration basin
 - Adhesion of sludge to sand particles
 - Emergence of agglomerated flocks (called “mad ball”)
 - Ununiformity in depth of sand bed

Then...

- Length of filtration continue time becomes short.
- Turbidity of filtrated water becomes high.

Rehabilitation of filter medium

10



Measure



Wash and Screen



Wash and Screen



pave

Contact

**su-jigyokaihatsu@
city.yokohama.jp**

**Kazuhiro KOJIMA (Mr.)
Shunsuke TAKAHASHI (Mr.)**

Leakage Prevention Works MCWD'S

Leak Detector &
Pipe Locater D305



Kenji Nakanosono

Stable supply of safe, better tasting water Vision of Water Supply Management MCWD'S

- Promotion of customer satisfaction management.
- Water service with high satisfaction of customers.
- Build an eco-friendly water supply system.
- Make safety and tasty water with top - level.
- Supply fresh water to a faucet anytime.

Compare The MCWD Vision

7-7

Stable supply of safe, better tasting water Necessity of leakage prevention

MCWD network of distribution pipes and the service pipes connected to them is constantly exposed to the danger of leakage due to the influence of vibration from passing vehicles, road construction and corrosive soil.

Stable supply of safe, better tasting water Necessity of leakage prevention

- The leakage not only wastes valuable water resources, but also causes secondary accidents such as poor water service, road depression and flood into the buildings.
- **Leakage control-corresponds to the development of water resources.**
- **The leakage prevention is one of the most important tasks for the MCWD 'S.**

Stable supply of safe, better tasting water

Water service with
high satisfaction of customer

- Constant supply of water
- Safe supply of water
- Safe drinking water

Leakage prevention works is very important
Leakage prevention works point :

Early found / Quickly repair

5

Stable supply of safe, better tasting water

Necessity of leakage prevention

It is necessary for the MCWD 'S
water to implement leakage
prevention measures.

We will Leakage survey together
(YWC & MCWD)

7-8

Leak Detector & Pipe Locator D305



Leak Detector & Pipe Locator D305



Transmitter



- ① **Red jack(+):** Connect Water Meter, Ground cock, Valves, Hydrant.
- ② **Black jack(-):** Connect Earth ground.

7-9

How to use Transmitter



- (1) **Power Button** ; Push the Button (**Switch on**)
- (2) **Impedance Matching Dial** ; Turn and adjust.
- (3) **Output Adjustment Dial** ; Set the between **1~2A**

Receiver : Manual Operating Procedure



- (1) **Power on Sensitivity adjustment dial** ;
move the receiver
- (2) **Adjust the dial to the sensitivity meter 8~10.**

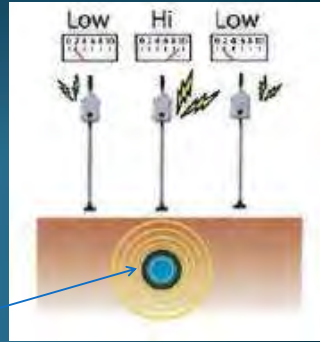
Receiver : Manual Operating Procedure



- (3) **Move the receiver away** :
Adjusting the dial to keep **8 ~ 10**



Receiver : Manual Operating Procedure



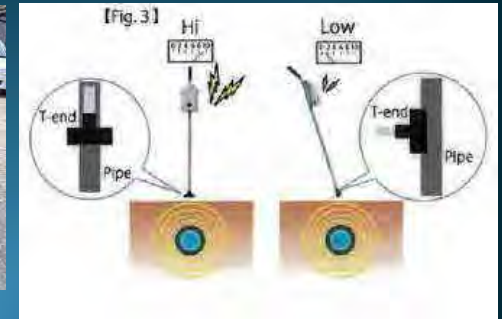
Water pipe
PVC

(4) The subject pipe : maximum Level

7-10



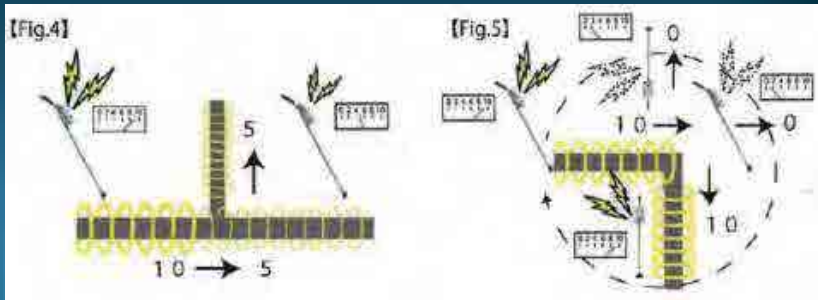
Receiver : Manual Operating Procedure



(5) T-end : Signal will decrease

Receiver :

Manual Operating Procedure



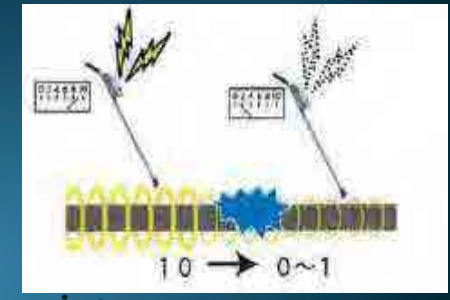
Service branch pipe

90° Bend pipe

(6) Decrease rapidly : Branch or Curve
Turn the receiver around 360

Receiver :

Manual Operating Procedure



Leaking point

(7) the leaking point :
The signal will be diminish rapidly and Lost completely.

After Survey Repair Pipe



It was measurement of trace amount of water from PVC pipe leak from a needle hole

From Joint crack

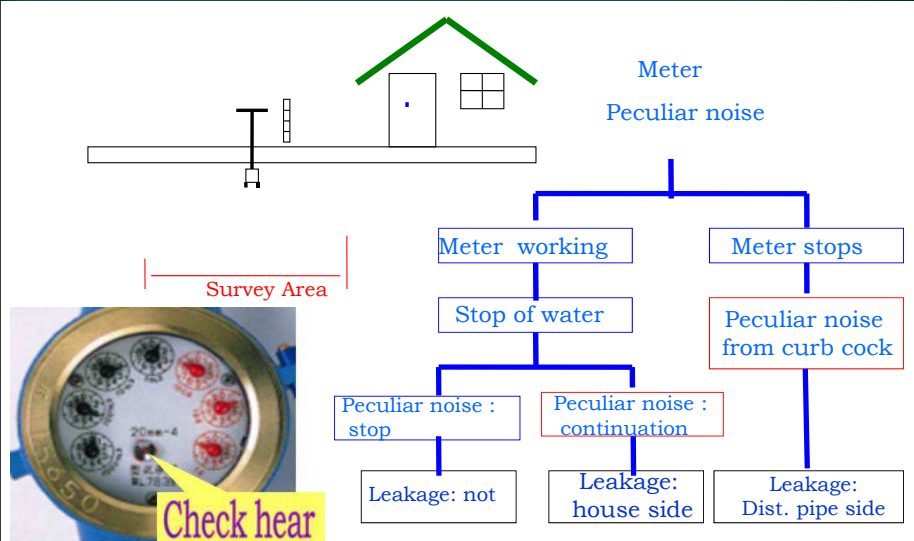


7-11

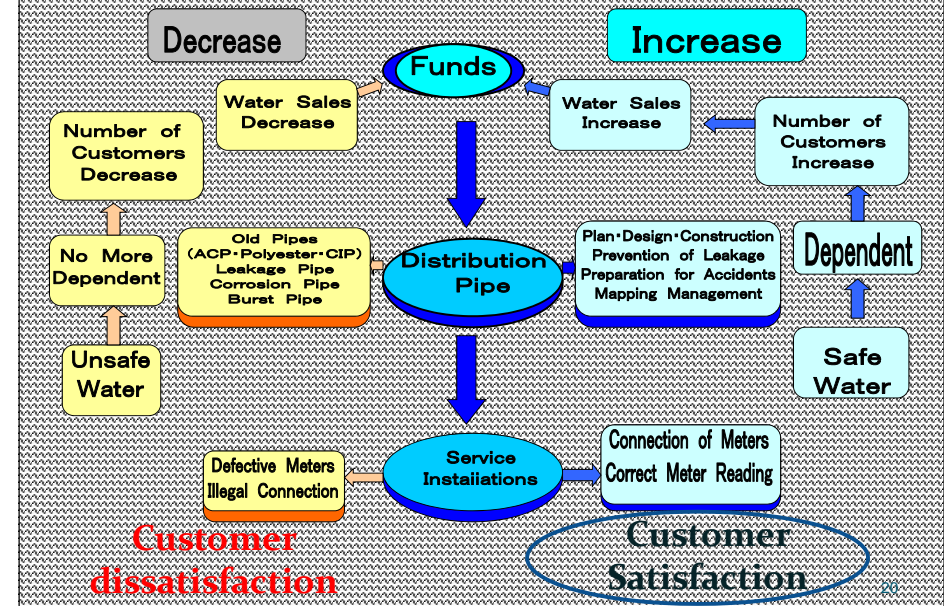
Survey cycle plan

Rank	Number of incidences discovered in previous survey	Survey frequency
A	More than 10 locations	Once a year
B	5 to 9 locations	Once a year
C	1 to 4 locations	Once every two years
D	0 locations	Once every three years

Measures method of Peculiar noise



Small Fund of O&M W S 2



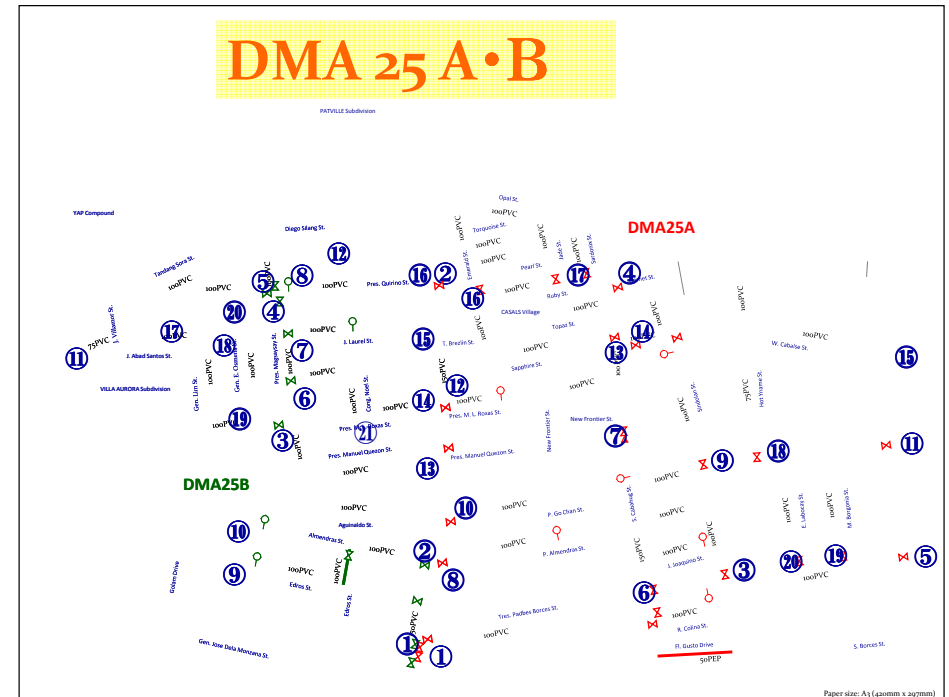
OK : Let's start

YWC · MCWD STAFFs Leakage detection & locating works

NRW 25A: 52.1%
25B: 19.2%



7-12



Leakage Survey Report (Daily Report)																	
DMA		Year / Month / Day			Survey team			Sign									
No.Line	Pipe size	Material	Length	Leakage survey DATA (Number of Detect)										Total	Rank	Remark	
				1	2	3	4	5	6	7	8	9	10				
1	2	PVC		P													
				V													
1	5	PVC		P													
				V													
3	4	PVC		P													
				V													
6	4	PVC		P													
				V													
10	11	PVC		P													
				V													
12	13	PVC		P													
				V													

Leakage Detection Report									
Survey Date		Y	M	D	Manager	Chief	Staff	Staff	
Leakage Point	DMA No.								
	Address								
	Name				Survey Staff				
DMA Map					Manager				
					Detail Map				

Details Design

Leakage Point Excavation Plan

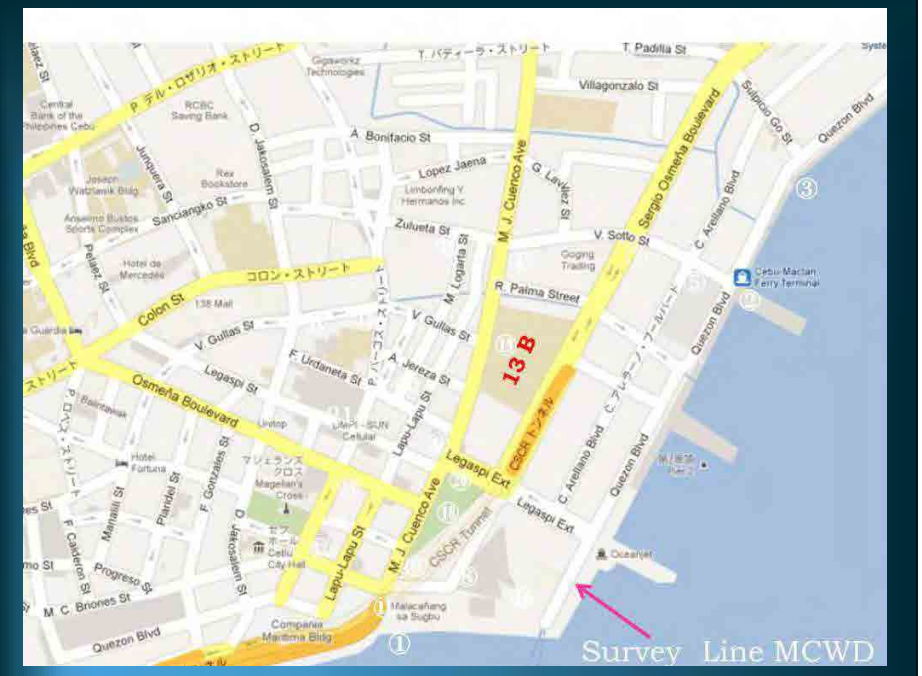
				City Road	
				Private Road	
				Private Land	
DMA No.	Leakage				
	Address	name		Detection Date	
Staff Name	Excavation	×	=	m ²	Instruction No.
	Square	×	=		

Repair Record Note

No.	DMA No.	Team No.	Detection Date	Address	Name	Leakage Volume	Pipe Size	Pipe Material	Leakage Conditions
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

7-13

No.	Address	Leakage	Excavation	Volume	Material	Conditions	Remarks
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
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18
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50



Survey Line MCWD

Transmitter

- ① Plug red test lead into red jack(+) on the transmitter, and connect red clip on the otherside to metal portion of the objective pipe.
- ② Plug black lead wire into a black jack on the transmitter, and connect the other side to separated earth ground; a metallic material such as a pole for street signs over 10m away from the transmitter.
Note1: Guard rails are multiple grounded, so they are not suitable for earth ground in this purpose.
Note2: if necessary, an Screwdriver or 25m cable drum accompanied in this kit can be used to get proper earth ground.
- ③ Push the "Power Button" on the transmitter, and set the "Output Adjustment Dial" between 1~2A.
- ④ Turn and adjust the "Impedance Matching Dial" to get the strongest output.



7-14

Receiver

- ① Turn the power/sensitivity adjustment dial on, and move the receiver close to the transmitter.
 If the tone signal will be heard from the receiver, it shows both the transmitter and receiver are working.
- ② Adjust the dial so as to the sensitivity meter shows 8~10. (Fig.1)
- ③ Move the receiver away from the transmitter, then the sensitivity level will be slightly decreasing.
 Trace the path with adjusting the dial to keep the sensitivity meter level between 8~10.
- ④ The signal receipt will be strongest on the subject pipe (the sensitive meter shows maximum level) and will decrease when moving away from it.(Fig.2)
- ⑤ The antenna with T-end should be oriented perpendicular to the path of the subject. When putting the T-end antenna parallel to the path, the reception of signal will decrease and you will know the direction of the path. (Fig.3)
- ⑥ When reception of the signal will decrease rapidly, it shows there might be blanch or curve in this point.
 Turn the receiver around 360° around this point if any branch lines are existing.(Fig.4,5)
- ⑦ At the water leaking point, the reception of the signal will be diminish rapidly and be lost completely.(Fig.6)
 If it will recover again after increasing the sensitivity of the receiver, there might be another reason such as branch, curve or etc.

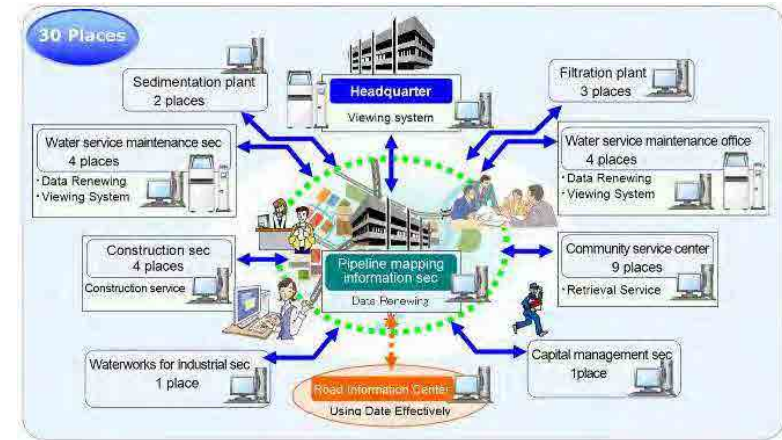
Introduction of Water Supply GIS Yokohama Water - Kokusai Kogyo



7-15

System Layout

Pipeline Mapping Information System constructed the network with the lease line of YOKOHAMA City, and are operated in Headquarter bureau and in the office in 30 places such as the water service maintenance sections. An individual information for water service facilities used under the strict management system, it works on the leakage prevention of information.



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Work Site



Main Office



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Work Site

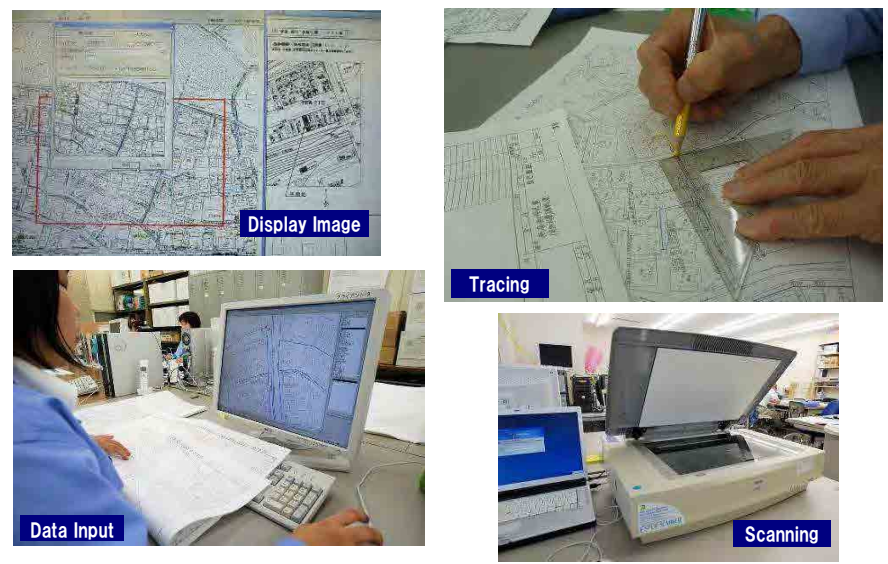


Work site

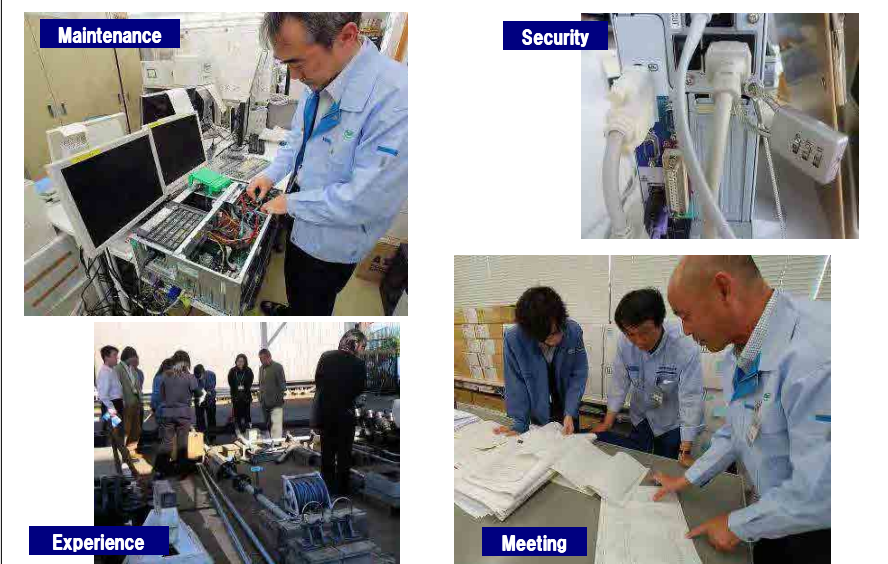


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Work Site



Work Site

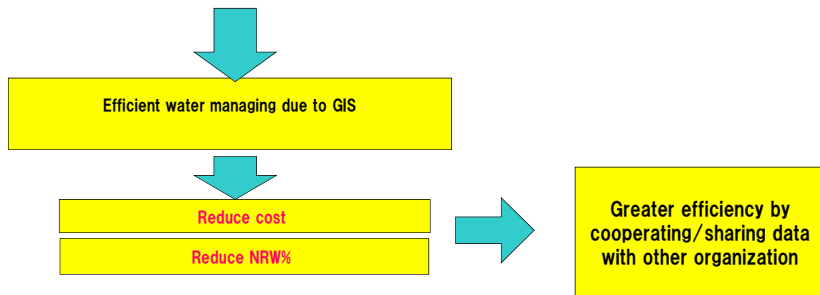


7-16

Improvement on managing water

Adopting GIS can...

- ① Increase management efficiency thru new mapping methods
- ② Optimize management system/methods
- ③ Improving annual planning
- ④ Provide valuable insights from Yokohama's system



For the operation of Water Supply GIS
 ~ Demonstaration~

For the operation of Water Supply GIS
 ~ Demonstaration~

Operational Image

Menu : Assemble
All functions

Tools : Assemble
Frequently use function

Searching :
location-based information

Status :
Angle, Map scale...

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Features - 1

Can handle all range of waterworks O&M tasks

High security
Passwords can be set to restrict access such as to 'manager' with data edit/update privileges and 'guest' for viewing only.

Data input/updating
Data can be easily inputted and updated whenever new water pipes or valves are added, and pipe maps can be drawn by mouse. Maps made with CAD software can also be imported.

Planning water works
Maximizes planning efficiency with search function that allows specific data to be found such as "pipe laid in __month __ year" to pinpoint which water pipes will need repairs or replacing.

Editing pipe map

Inputting attribute data

GIS

AutoCAD

Compatible

Colored according to attribute data

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7-17

Features - 2

Filing system
Allows integrated management of various data such as waterworks ledger, construction schedules, pictures, maps and Excel files.

Supporting water fee collection
This system can be coupled with a water fee collection system to upload necessary data (valve and water supply number, volume used, meter number, resident name, water fee, etc.), and plan the most efficient collection route based on mapped route data of the meter readers. This ensures no houses are missed by the fee collectors.

Simulating water outages
When there is a water leak, areas effected by repair works can be simulated. By inputting the location of repair works, the closest valve can be found and a list of residents affected by the water cut-off once the valve is closed can easily be produced.

Filing

Design blueprint

Ledger

Data output

System for calculating water fees

Fee data

CSV format

Data upload

Waterworks system

Collection route

Can be used to highlight water meters that need replacing.

Water outage (red)

Repairs

Repairs

List of residents affected

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Demonstration

Searching ~Simulation of water outage~

- Searching broken pipelines, display its distribution condition
- Investigation effect of water outage due to waterworks

Basic Function

Colored displaying

Support function on cut off water

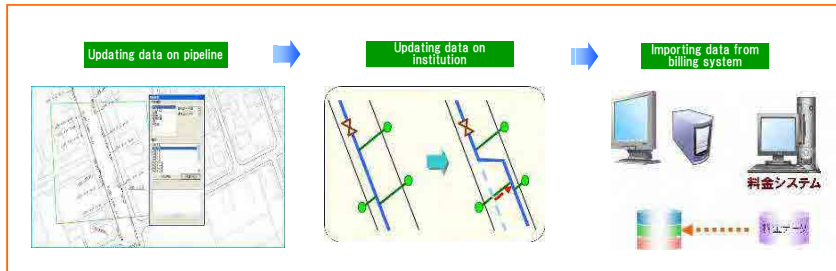
simulation

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Demonstration

Data updating

- Newly laid water pipelines
- Newly Input facility water supply
- Import data from billing system and reflect them into mapping system



Conclusion

Establishing reliable and efficient water management system and Database are vital for...



① Centralization of pipeline information
→ Adequate management



② Optimization of works
→ Cost reduction



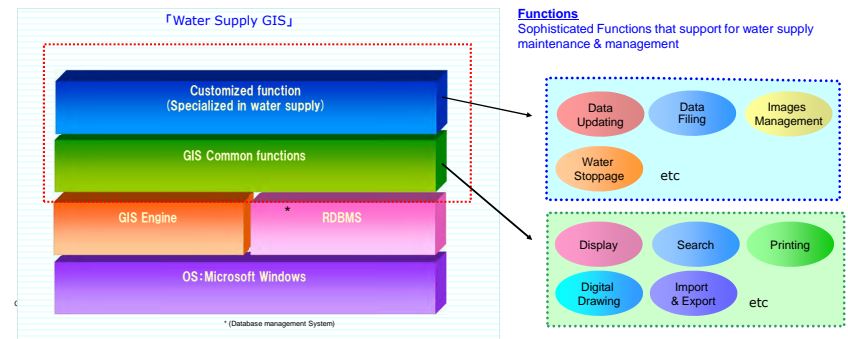
③ Reduce NRW% and increased fee collection rate

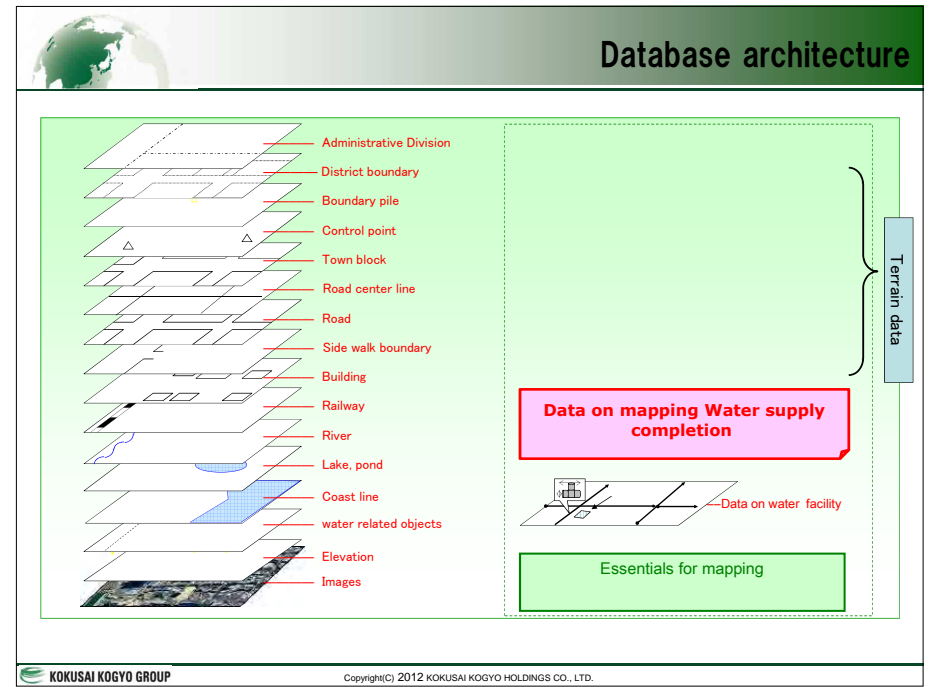
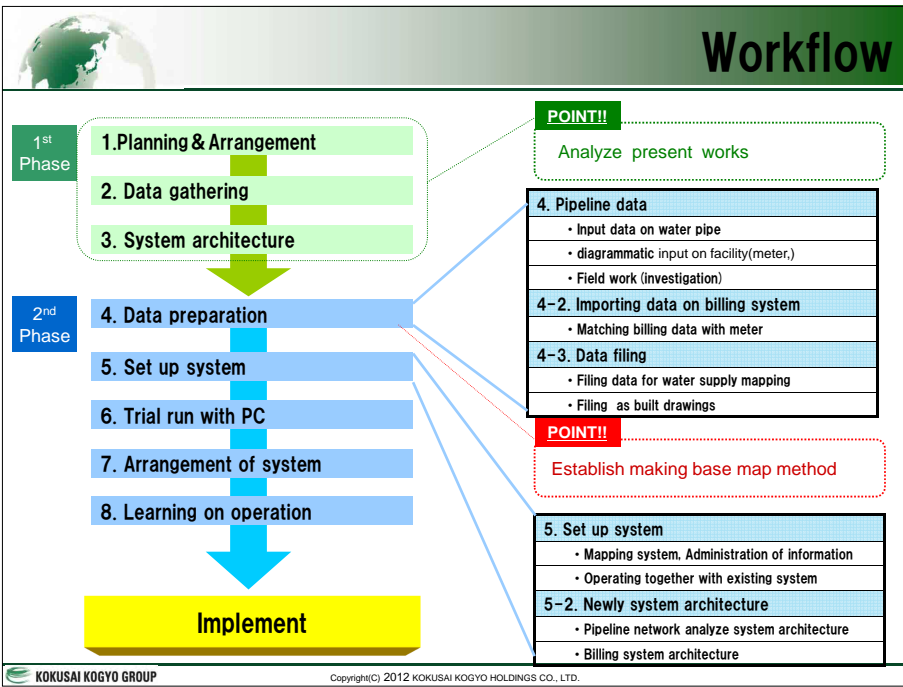
Reference materials

Features of system

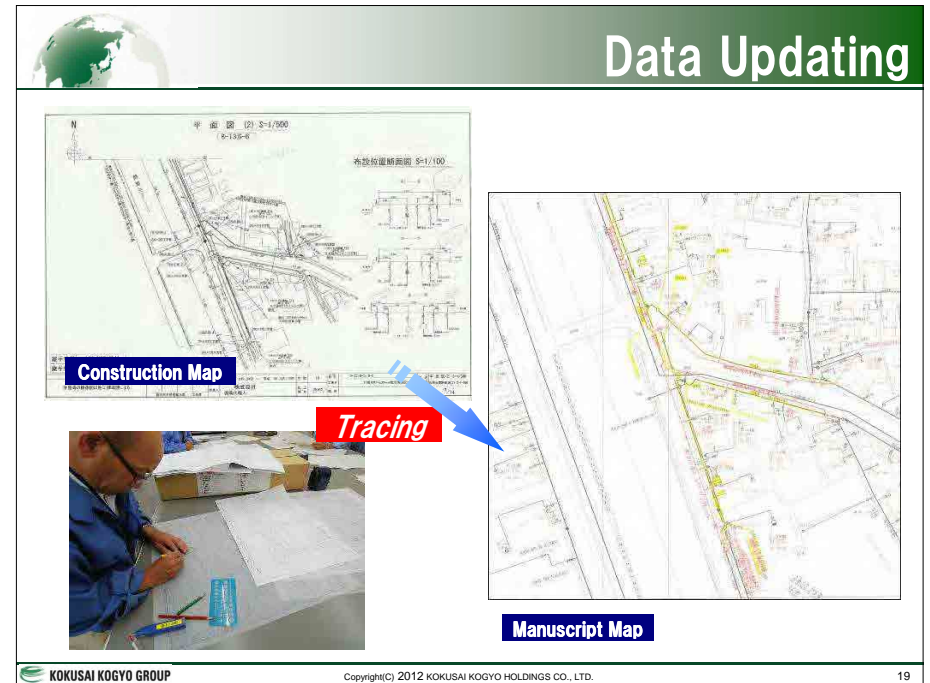
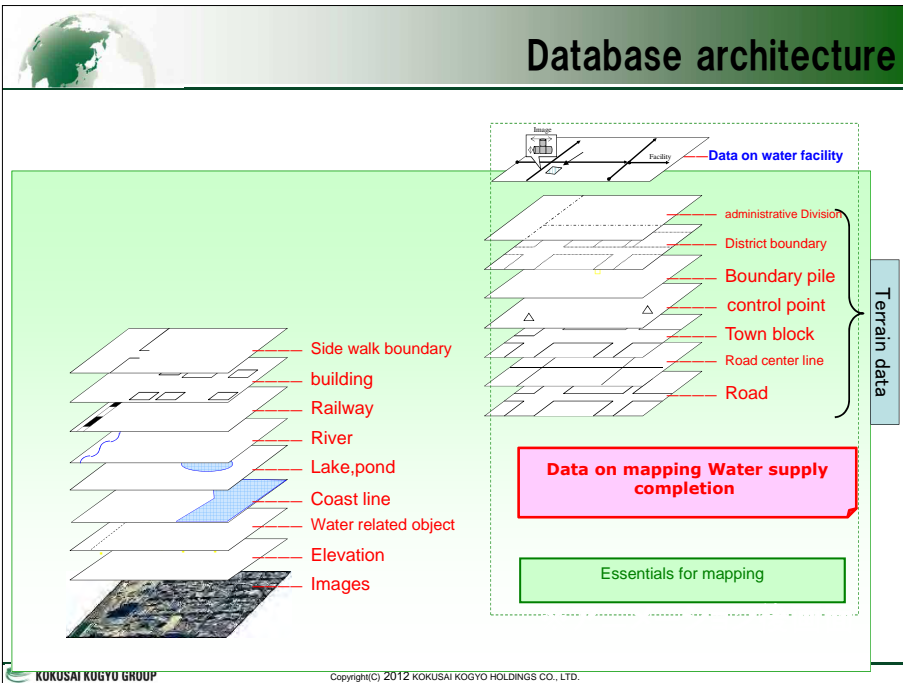
Water Supply GIS

- Full support on water supply management business
- Useful functions(Filing, support for water stoppage, security,etc)
- Common platform with water sewage management system

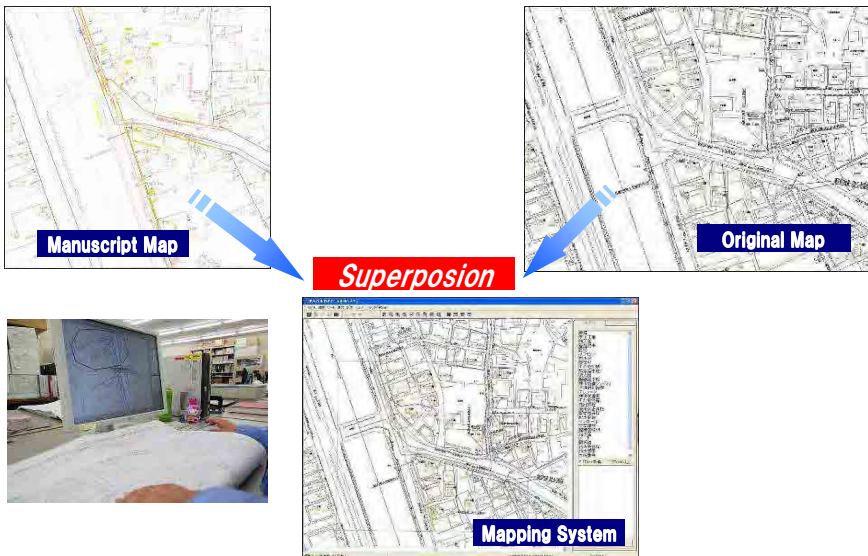




7-19

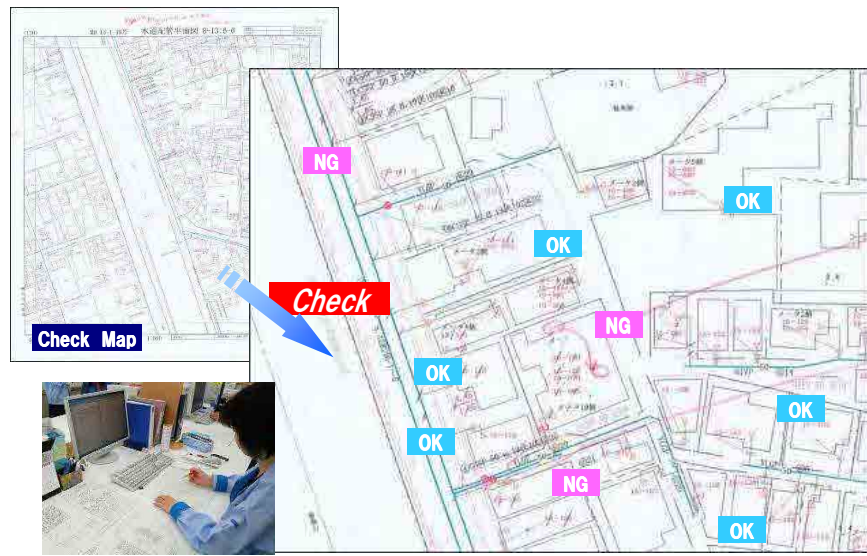


Data Updating

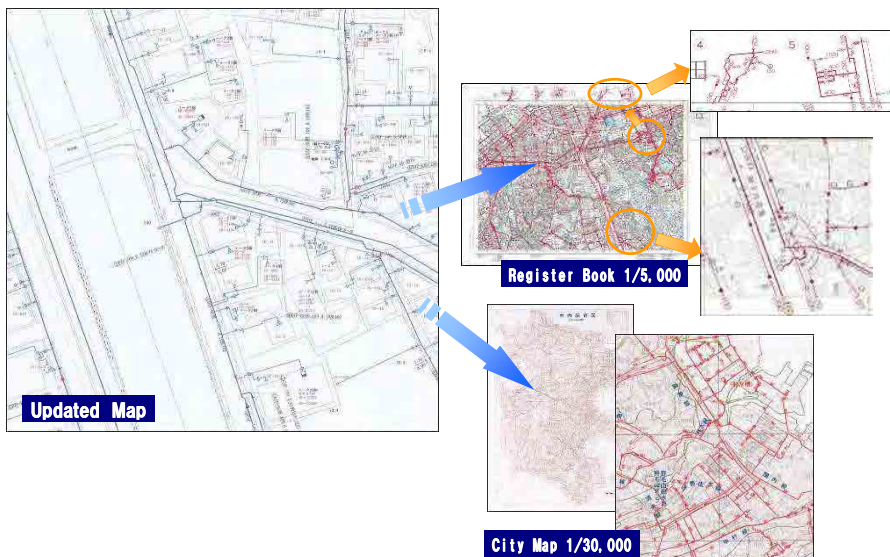


7-20

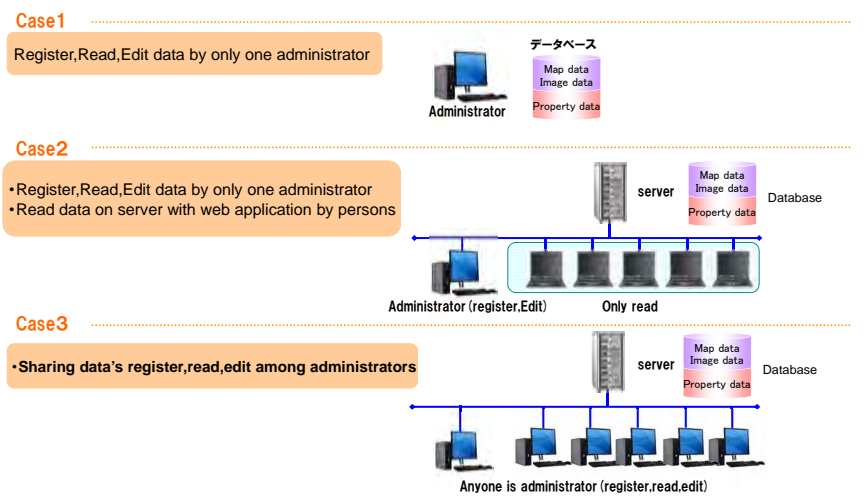
Data Updating



Data Updating



Introduction of system



Structure of KOKUSAI KOGYO GROUP

KOKUSAI KOGYO HOLDINGS CO., LTD.
Tokyo Stock Exchange (code : 9234)
56 subsidiaries
7 associate companies



Development of solar power generation facilities

KOKUSAI KOGYO CO.,LTD. (KKC)

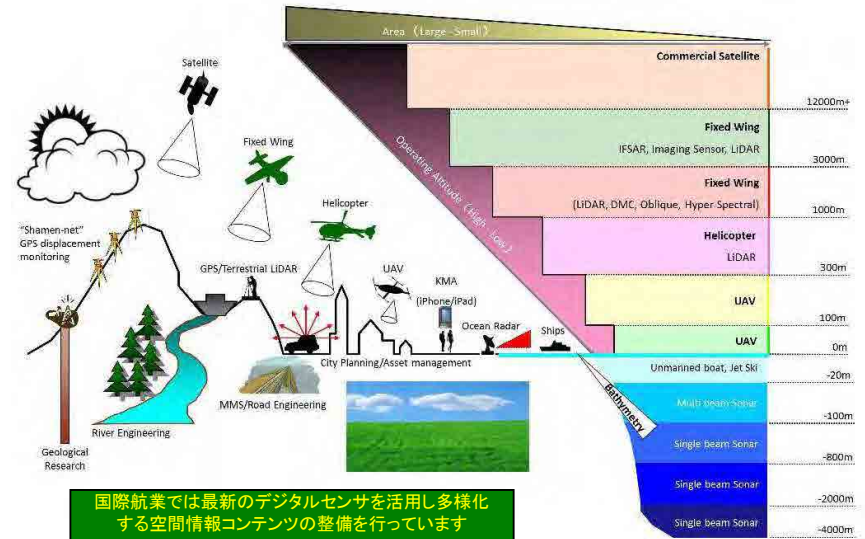
Corporate Data (March, 2011)

Established	September 12, 1947
Capital	US\$ 167.2 million
Net sales (#1)	US\$ 385 million
Number of Employees	1,163
Domestic Bases	47
Scope of Business	Engineering and consulting services - Spatial Information services - Geological surveying and National land design solutions - Energy related business (new) , etc



80% of KKC project volume is made up of national and local government contracts.

Spatial Information Technology

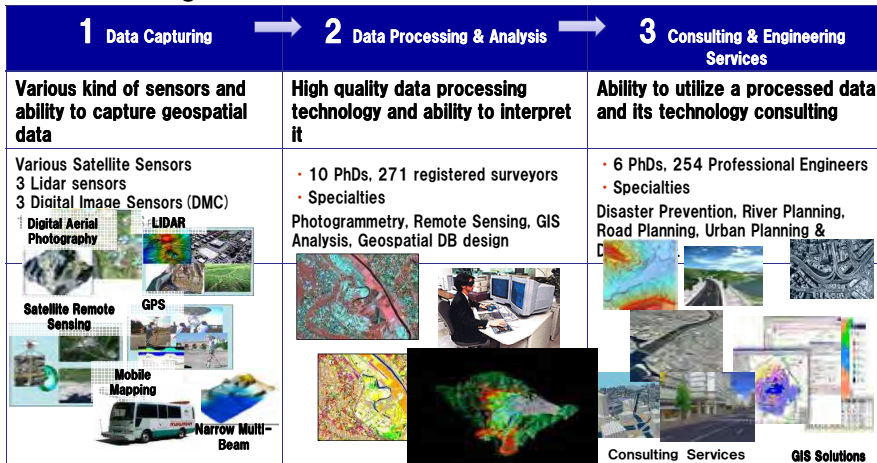


国際航業では最新のデジタルセンサを活用し多様化する空間情報コンテンツの整備を行っています

7-21

Retaining "well-balanced" three Strengths

- KKC can provide the total solution from Data capturing to Consulting



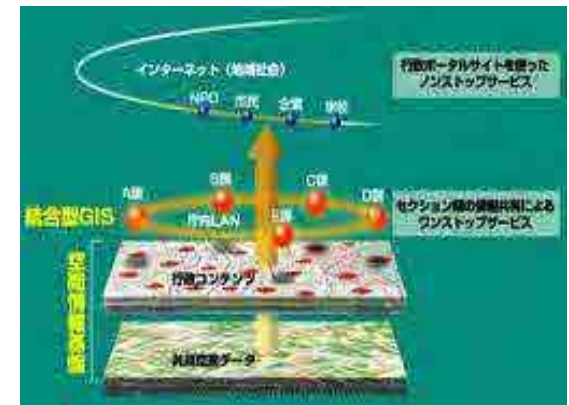
Spatial Information Business - 2

E-Government Implementation - Large Share for Administrative Affair & Inventory Maintenance -

Administrative Affair: Huge number of Inventories related to maps are stored

Administrative Support

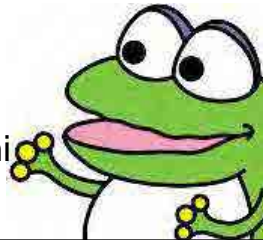
- Urban Facility Management
 - Water & Sewerage Database
- Fix Property Tax Management
- Road Management
 - Facility Management Database
- Urban Planning Support
 - Database Production/Development
- Integrated GIS* Installation Support



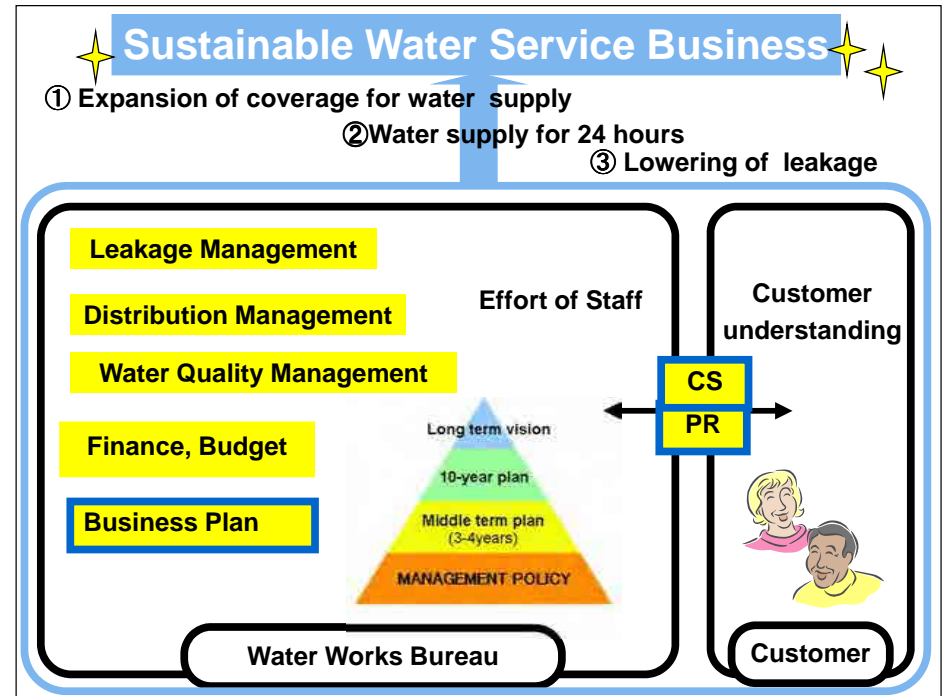
Sustainable Water Service Management

~ Business Plan, CS, PR ~

Yokohama Waterworks, JAPAN
Business Planning div. Akiko Takeuchi



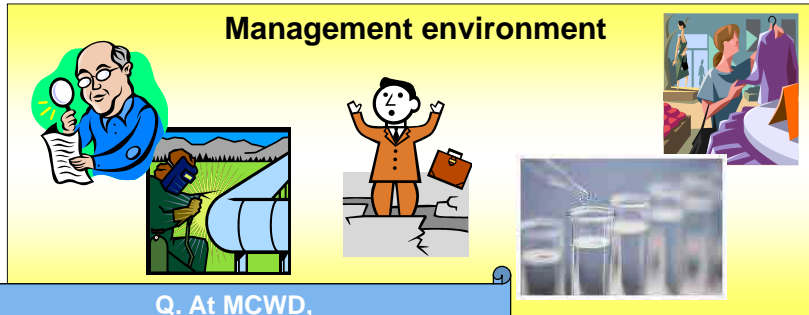
7-22



Back ground of Business plan

Business Plan

Management environment



Q. At MCWD,
What kind of problem is there?
10-year...3-year...

Long term vision • 10-year plan

- Clarification of the future image of the business that surveyed 20 years later.
- It is devised the 10-year main measure based on the image in the future.



Business Management Plan of Yokohama

• Enforcement plan of the concrete measure that advocated by long term project
More than 3~5 years

Long term vision

10-year plan

Middle term plan (3-4 years)

MANAGEMENT POLICY

• Set a future image and the aim that the company should aim at
• Made a concrete measure clear for aim realization
More than 10 years

• Enforcement plan of the main business in the Middle plan
• Annual budget
Less than one year

Business Management Plan of Yokohama

Basic idea !

Safe City Water for supporting the Comfortable Life of the Citizens

Goals !

- Safe and tasty water at the top level
- Fresh water always delivered to the faucets
- Reliable life-line proved against disasters
- Services that satisfies the customers
- Energetic corporate atmosphere for creating and challenging
- Environment-friendly city water



Business Management Plan of Yokohama



“Management policy” is also one of the tools that clarify the objectives of your organization and unite the staff’s consideration.

THIS IS OUR GOAL!!



7-23

The Management Policy

Main Measures to the goals (6)

平成23年度 水道局 運営方針	
今こそ 確かな あん・しん・かん	
～ 安全な水 信頼のサービス 環境への貢献をめざして ～	
II 目標達成に向けた施策	
1 トップレベルの安全でおいしい水を提供します 水道の安全に努めるとともに、排水浄水場における浄水技術を導入するなど、水質の向上を推進し、安全でおいしい水の提供を目指します。	2 蛇口にいつでも新鮮な水をお届けします お客様が管理する貯水槽水漏れ防止装置について、漏れ防止への啓発や緊急対応の取組などを促進します。
3 災害に強い信頼のライフラインを築きます 大規模災害時にも、お客様に安心して水を供給できるように、浄水場・配水施設の設備強化や水漏れの対策を進めます。	4 お客様満足度の高い水道サービスを提供します 水道のサービスの安全活動と市民との協働や、広報・応酬の充実などを通じて、職員一人ひとりが市民の生活の向上に貢献します。
5 顧客と信頼の協力ある企業精神を確立します 水道局の保有する技術、ノウハウを活かし、顧客のサービス提供と連携してさまざまな民間企業等の推進や、国内外の水道事業の発展に貢献します。	6 環境にやさしい水道システムを構築します 節水型トイレの普及を推進し、節水型シャワーの導入などにより、節水を促進し、環境にやさしい水道システムを構築します。
III 目標達成に向けた組織運営	
① 経営基盤の強化 経営基盤の強化を図り、経営の透明性を高め、信頼の醸成を図ります。	② 人材育成 人材育成の推進を図り、経営の透明性を高め、信頼の醸成を図ります。
③ 技術革新 技術革新の推進を図り、経営の透明性を高め、信頼の醸成を図ります。	④ 環境貢献 環境貢献の推進を図り、経営の透明性を高め、信頼の醸成を図ります。

Core objectives for 2011
 • Secured Water
 • Reliable Service
 • Eco-friendly

Operation policies to the goals (4)

pop!!

横浜市水道事業中期経営計画 を策定しました!

「快適な市民生活を支える安心の水道～次世代に引き継ぐヨコハマのおいしい水～」を基本理念に経営計画を策定し、それに基づき毎年度の事業・事業を実施しています。
市庁や職員のみならず市民も巻き込み、新たな中期経営計画(平成24年度～27年度)を策定しました。

1. 水道事業の現状と課題

水道は市民生活や経済活動に欠くことのないライフラインです。安全や信頼性を保ち、持続可能な水道事業を実現するためには、多岐にわたる課題の克服・改善が必要で、多岐にわたる事業を推進する必要があります。

2. 施策の方向性と主な取り組み

1. 信頼性を確保し、安心・安全な水道供給の確保を図るとともに、これらに取組む事業の推進を図ることによって、信頼性の向上を図ります。

安全・安心な水

安全で良質な水を安定して供給するためには、水質浄化施設の老朽化対策や浄水場の設備更新、配水管の老朽化対策、漏水防止対策など、水道施設の更新・刷新に取り組んでいます。
また、浄水場の設備更新と配水管の老朽化対策を同時に実施することで、コストを削減し、効率化を図ります。

環境への貢献

環境にやさしい水道システムの実現に向け、水の消費や水質汚濁の削減を図ります。また、再生水の利用や節水器具の普及など、節水の推進に取り組んでいます。

情報のサービス

顧客定数の増加やコスト削減の推進など、業務の効率化を図ります。また、水道サービスの向上を図るため、水道サービスの改善に取り組んでいます。

3. 財政収支計画

水道料金の収入の減少や、必要となる事業の増大など、厳しい財政状況に直面しています。そのため、収入の増大と支出の削減を図ります。

① 純利益の確保

経費の削減や効率の向上により、毎年10億円以上の純利益を確保します。

② 累積資金の確保

純利益の内、一定額を積み立て、将来の更新・刷新の資金を確保します。

③ 企業債発行の確保

将来の更新・刷新の資金を確保するため、平成23年度末に発行した企業債の償還を完了させ、新たな企業債の発行を確保します。



Programs/activities to promote CS

CS

Present programs/activities

Training

- ▶ Hands-on training at CSC
- ▶ Study visit to CSC from each division
- ▶ Listening to audio data of customers' voices

Survey

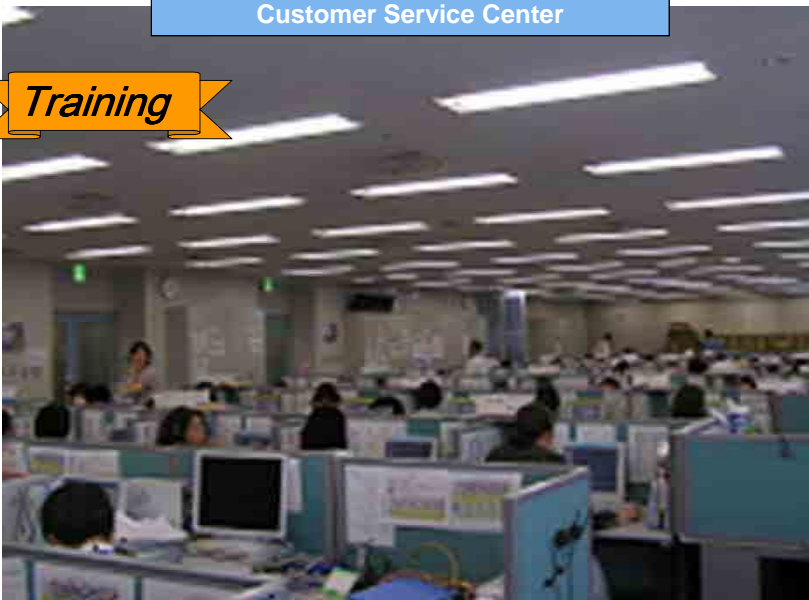
- ▶ Surveys of customer service/ satisfaction
- ▶ Internet Monitor

Information sharing

- ▶ Newsletter for staff "CS Correspondence"
- ▶ Update and upgrade of the website

Customer Service Center

Training



Information sharing

Water Works Bureau

demand opinion indication

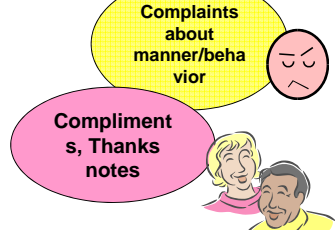
No.	内容	担当者	完了日
1
2
3
4
5
6
7
8
9
10



Customer Service Center



Customer



Who received?	Contents of customer's voice	Action for customer's voice	Why that problem happened?	How to improve
Who is in charge of?				

Categorize
 • demand
 • opinion
 • indication

Survey

To exploit "The voice of the customer"
 • The voice from a water monitor



7-25

Survey

Customer Satisfaction survey

- Manners and explanation of the staff
- Overall service of YWWB
- Hint to customer service improvement action



Customer Awareness survey

- Safety and the saving water of the city water
- About the means of payment of the water rate
- About the security of the drinking water at the time of the disaster etc...
- Hint for management plan development



Survey

questionnaire

【Outline】

- Waterworks Q.25 /Sewerage Q.9
- Safety of tap water and saving water
- About customer service
- About public relations of waterworks etc...

- Customer personal information
- Residence area
- Ages
- Water consumption etc...

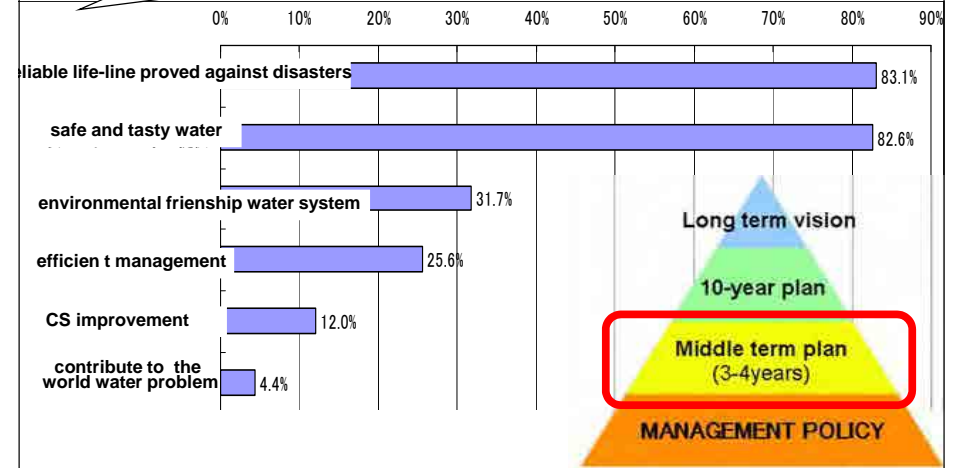
•Customer Satisfaction
•Customer Consciousness



•Customer Attribution
Real water using situation

•The number of the effective collection
1,655 samples(41.4%)

Q. Please show your idea,
which business should YWWB do our best in the future?
(please chose 3 business)

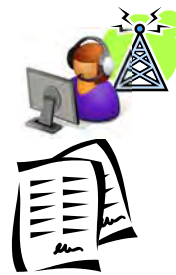


7-26

Survey

【 The way of collecting more customer voice 】

- Daily collection of customer needs
- From the customer investigation
- Questionnaire at event



Aim of the customer service improvement



The ratio of customers who answer "satisfied" and "slightly satisfied" about correspondence

※from result of CS survey at call center

(Aim)
2025FY : 90%

↑
2020FY : 88.6%



PR Action items in 2012

PR

For customer's trust,
and satisfaction improvement



- Public information about the business condition
 - Promoting inflection of the tap water
 - Anti-disaster measures
- + the other events...

7-27

media

Public information
magazine
-web



Bottled water
"HAMAKKODOSHI"



Customer
communication

Various event



Various media



Promotional Activities
By regional Service Center in YOKOHAMA



Staff's idea!

PR to citizens
Water Class at elementary schools
(for 9-10 years-old kids)

Staff's idea!





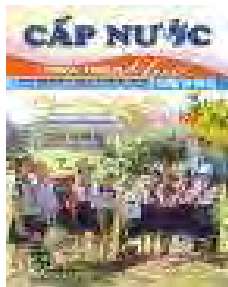
The visit to the plants



Surveying and collecting customers' opinion



Writing water column in provincial newspapers



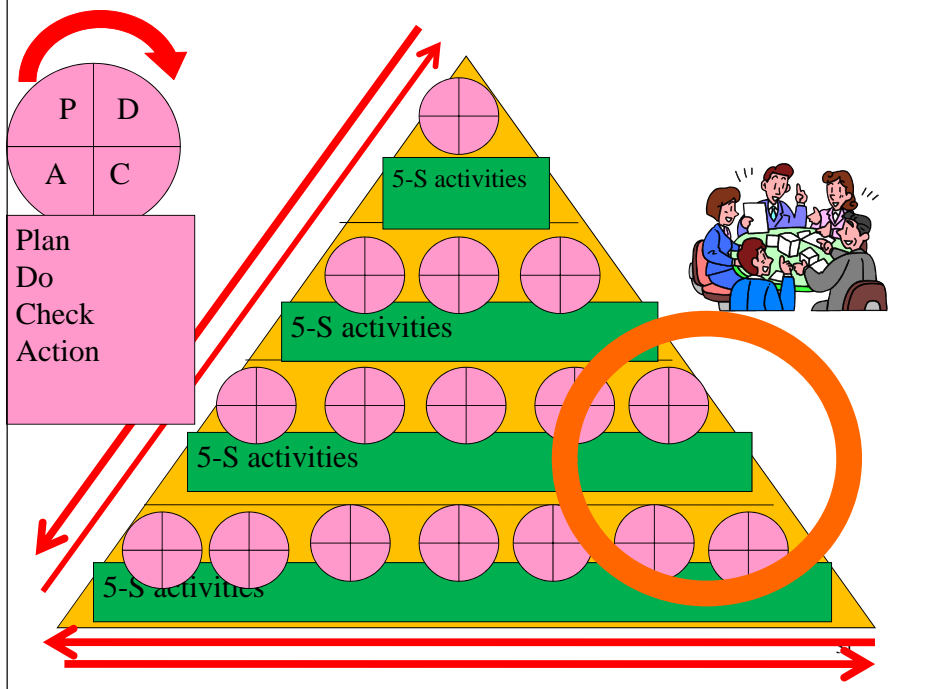
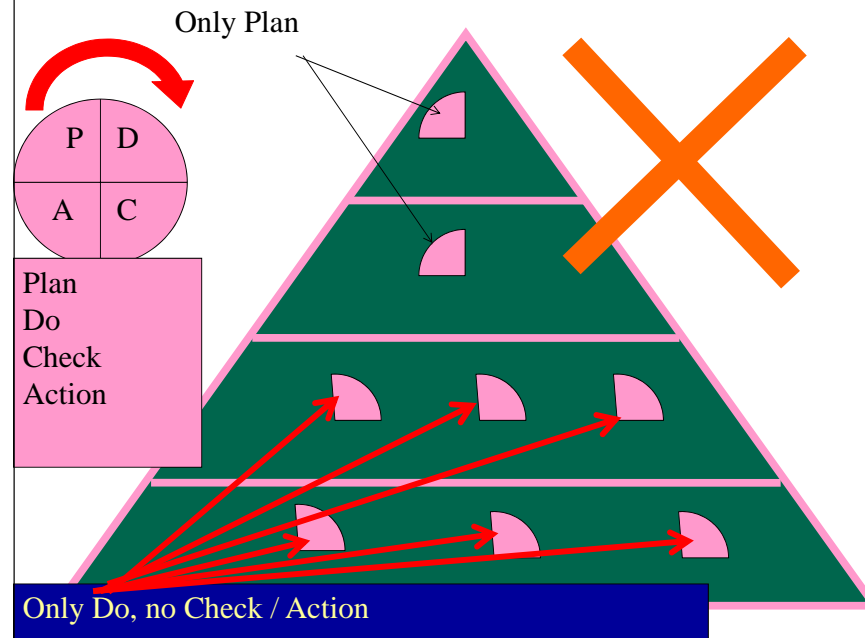
Customer information brochure



Website internet

Creating a good relationship with community

7-29



YWW Improvement activity convention

