Practical Reinforcement Action of Risk and Crisis Management with Participatory Planning using a Workshop Method -Emergency Response to Natural Disasters

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Masao KADOWAKI, Hanshin Water Supply Authority
Nagahisa HIRAYAMA, Dr. Eng., Kyoto University
Daiji NAGASHIO, Hanshin Water Supply Authority
Masakazu MIHARA, Hanshin Water Supply Authority

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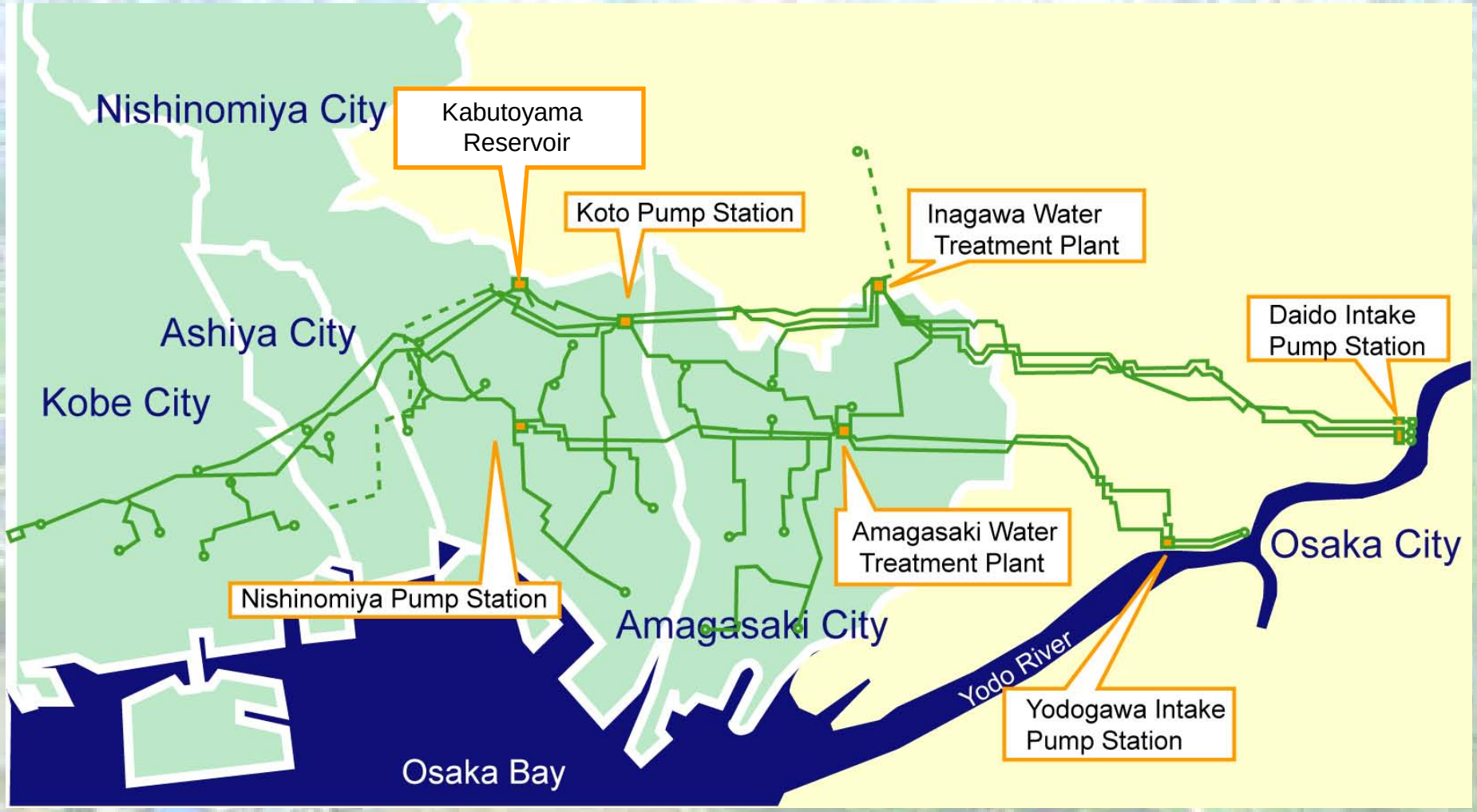
- Background for developing a risk and crisis management by participatory planning using a workshop method
- Efforts for natural disasters in the risk and crisis management plan
- Preparation of manuals and training for crises
- Advantages of adopting participatory planning using a workshop method

Outline of facilities of Hanshin Water Supply Authority



Previous Risk and Crisis Management

To supply a sufficient amount of water and to ensure water quality

- Natural disasters (mainly earthquake)
  - *Renovation of WTP and pumping station*
  - *Installation of anti-seismic pipelines*
- Man made threats (acts of terrorism etc.)
  - *Installation of automatic security systems*
  - *Introduction of bioassay in intake pumping stations and WTP*
- Accidents (failures of equipment, water leakage etc.)
  - *Outline of Accident Preparedness Plan and Guidelines for Enforcement of Command in Emergencies*

Pressure on HWSA to Address Issues of Risk and Crisis Management Are Increasing

Previous

- Natural disasters (mainly earthquake)
- Man made threats (acts of terrorism etc.)
- Accidents (failures of equipment etc.)

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Future

- Natural disasters (climate change)
- Man made threats (cyberattacks)
- Unprecedented crisis

Process of Risk and Crisis Management

- It is indispensable that the staff should participate in developing risk and crisis management plans and crisis emergency response manuals
  - Increase AWARENESS OF IMPENDING CRISIS
  - Develop FACULTIES FOR CRISIS EMERGENCY RESPONSE
- **Participatory planning in developing a risk and crisis management plan using a workshop method**

Structure of “Strategic Plan”

Broad/Abstract

Goal

Objectives

Policies/Measures

Projects/Actions

Focused/Specific

Risk and Crisis Management Plan

Goal	*Category*	*Objectives*	*Policies/Measures*	*Projects/ Actions*	*Activities*	*Operational procedures*	*Period*
To provide a secure and reliable water supply in any crisis or emergency	Organization and systems	To establish an organization and system to ensure high awareness of possible crisis for all staff	Clarify role of each person in an emergency				
			Establish system to share information at any time				
			Establish contact system in an emergency, etc.				
	Human resources	To ensure that staff can give appropriate advice to directors and support workers in an emergency	Conduct a capacity development for coordinating entire HWSA				
			Recruit excellent external human resources, etc.				
	Information management	To control information so that staff can make rapid and appropriate judgments and take action quickly recover water supply	Establish procedures for contact				
			Assign roles of information collection in an emergency				
			Provide information to related organizations, etc.				
	Facilities and logistics	To maintain facilities and logistics with high robustness to crises	Ensure water quality even in an emergency				
			Carry out seismic capacity improvement and seepage prevention measures				
			Realize preventive facilities for crises, etc.				
	Recovery and reconstruction	To ensure same understanding of crises between the HWSA and external organizations and carry out recovery in accordance with designated goals	Set goals for recovery and reconstruction				
			Determine crisis level, etc.				

Policies/measures of the Plan for natural disasters

- Organization and systems
  - To establish a support system and to clarify the role of each person in an emergency
- Human resources
  - To conduct a capacity development for coordinating the entire Authority
- Information management
  - To establish a communication network and to offer information to related organizations
- Recovery and reconstruction
  - To set goals for recovery and reconstruction

→ common manuals for individual crises

- Facilities and logistics
  - To improve the facilities for ensuring the quality and amount of water supplied

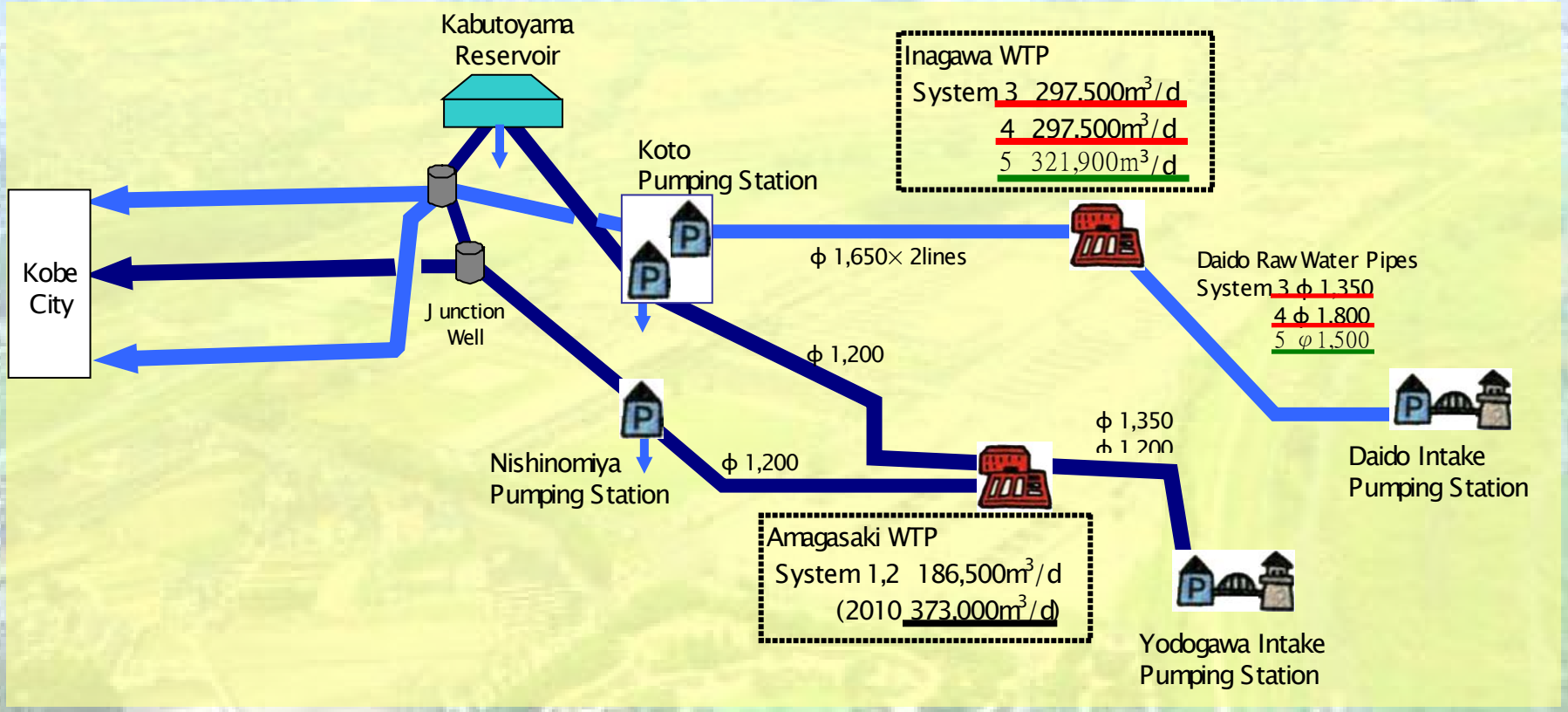
seismic capacity improvement →

The current Facilities Improvement Plan

Risk and Crisis Management Plan for the category of facilities and logistics

Objectives	*Policies/ Measures*	*Projects/ Actions*	*Activities*	*Operational procedures*	*Period*
To maintain facilities and logistics to ensure resistance to damage	Ensure 75% of water supply	Take measures against power failures			Short term
		Promote seepage prevention	Take seepage prevention measures for power-receiving equipment		Short term
			Take seepage prevention measures for pumps		Short term
		Carry out seismic capacity improvement of facilities and pipelines	Evaluate earthquake resistance of facilities	Investigate soil conditions	Short term
			Promote antiseismic project	Renovate pipelines of systems 1, 3, and 4	Medium tern
				Complete construction of Amagasaki WTP	Short term
	Ensure 50% of water supply	Take measures against power failures			Short term
		Promote seepage prevention	Take seepage prevention measures for power-receiving equipment		Short term
			Take seepage prevention measures for pumps		Short term
		Carry out seismic capacity improvement of facilities and pipelines	Evaluate earthquake resistance of facilities	Investigate soil conditions	Short term
			Promote antiseismic project	Renovate pipelines of systems 1, 3, and 4	Medium tern
				Complete construction of Amagasaki WTP	Short term
	Ensure 25% of water supply	Take measures against power failures			Short term
		Promote seepage prevention	Take seepage prevention measures for power-receiving equipment		Short term
			Take seepage prevention measures for pumps		Short term
		Carry out seismic capacity improvement of facilities and pipelines	Evaluate earthquake resistance of facilities	Investigate soil conditions	Short term
			Promote antiseismic project	Renovate pipelines of systems 1, 3, and 4	Medium tern
				Complete construction of Amagasaki WTP	Short term
		Improve regulating reservoirs	Install more regulating reservoirs		Long term
	Ensure 75% of water treatment	Take measures against power failures			Short term
		Take seepage prevention measures for Daido Intake Pump Station	Take seepage prevention measures for power-receiving equipment		Short term
			Take seepage prevention measures for pumps		Short term
		Improve systems 3 and 4 of Daido raw water pipes			Medium tern
		Complete construction of Amagasaki WTP			Short term
		Renovate systems 3 and 4 of Inagawa WTP	Carry out seismic retrofitting of water treatment plants		Medium tern
			Improve clear water reservoirs		Medium tern

Capacity of HWSA Facilities

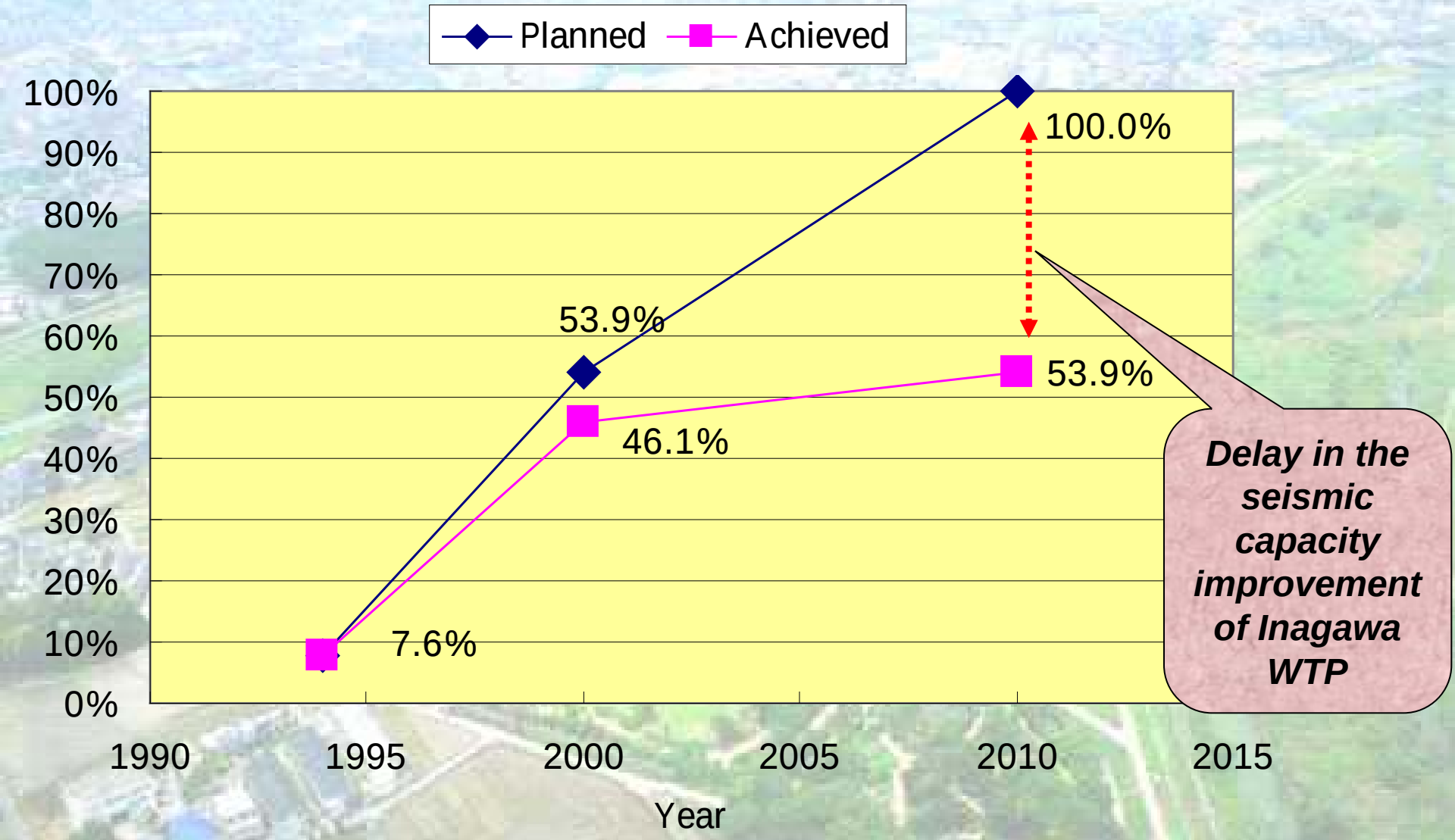


- ◆ *Systems 1 and 2* — *mostly renovated*
- ◆ *System 5* — *new system (anti-seismic facilities)*
- ◆ *Systems 3 and 4* — *not renovated yet*

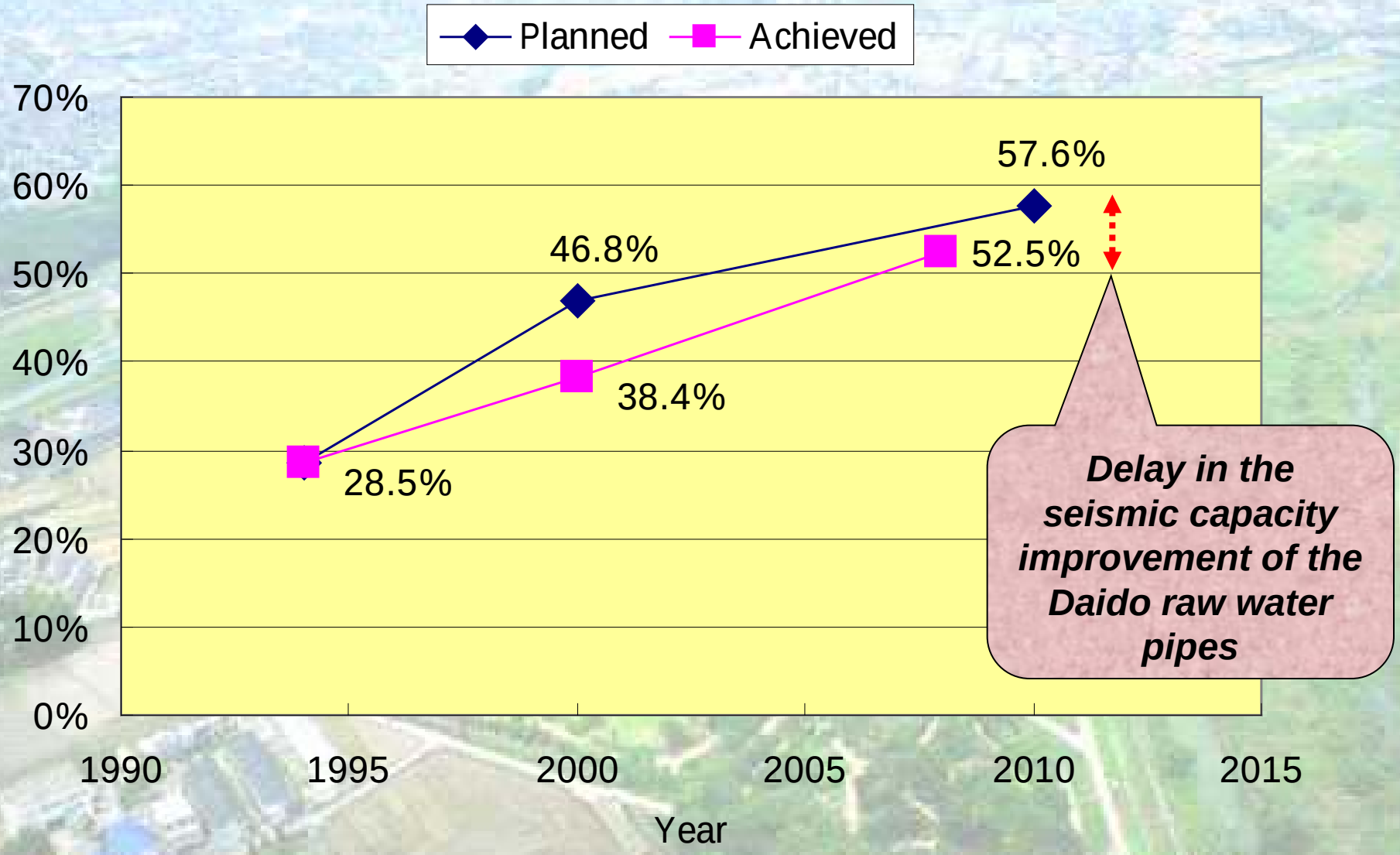
Goal and each step of *the Plan to Improve Earthquake Resistance of Facilities*

Period	Policy of improvement	Water treatment plant			Main pipeline (raw water pipes and water transmission pipes)		
		Anti seismic level (%)	Anti seismic facilities (m^3/d)	Entire facilities (m^3/d)	Anti seismic level (%)	Length of anti-seismic pipelines (km)	Total length of pipelines (km)
1994	-	8	80,000	1,048,000	29	35	123
First step (1995-2000)	·Seismic capacity improvement of damaged and aged facilities ·Renovation of Amagasaki WTP ($373,000m^3/d$)	54	694,900	1,289,900	47	61	131
Second step (2001-2010)	·Seismic capacity improvement of systems 3 and 4 of Inagawa WTP and Daido raw water pipes ($595,000m^3/d$) · Improvement of reserve capacity of purified water	100	1,289,900	1,289,900	58	75	131
Third step (2011-)	·Establishment of wide-area network	-	-	-	-	-	-

Anti-seismic Level of WTP



Anti-seismic Level of pipelines



Preparation of manuals and training

- The Risk and Crisis Management Plan
  - **Avoid a complete cessation of the operation of all the facilities**
  - **Carry out improvement of Amagasaki WTP and the seismic capacity improvement of Inagawa WTP and the Daido raw water pipes**
- The Plan to Improve Earthquake Resistance of Facilities
  - **Delay in the seismic capacity improvement of Inagawa WTP**
  - **Delay in the seismic capacity improvement of the Daido raw water pipes**

➢ ***Improve the capability of staff and facilities to deal with crises by preparing manuals in accordance with the Plan***

Example of preparing manuals

No	
Section	Amagasaki WTP

Cessation of water supply pump due to power failure

Crises assumed

check	No	Activities
☐	1	Understand conditions
☐	2	Report conditions
☐	3	Contact related section and company
☐	4	....
☐	5	....

Response Actions

※ Emergency contact(HWSA)

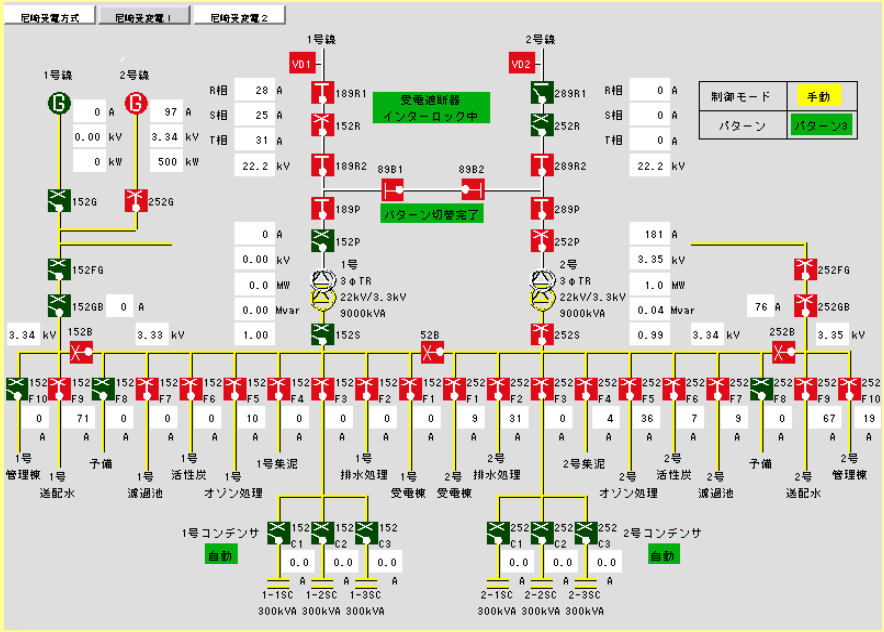
Section	Phone No
Purification administration	○○-△△-×××××
○△× section	○○-××-△△△△

※ Emergency contact(Others)

Company	Phone No
Kansai Electric Power Co. Inc.	○○-×△-×△△△
○○× Electric Corporation	○○-○△-×△○△

Data Area

◇ Connection diagram



Field Training
(emergency supply of water)

Tabletop Exercise
(abnormal quality of raw water)

Capacity development program

Year	Contents of training/exercises	Type
2009	WS on running-water operation, 4cases	WS
2008	Treatment of leakage (considering effects on trains)	Tabletop exercise
	Power failure at WTP	Tabletop exercise
	Detection of abnormal quality of raw water at intake pump station (caused by oil spillage)	Tabletop exercise
	Call-up training	Training on communication
	WS on response to accidents, 2cases	WS
	WS on running-water operation, 2cases	WS
2007	Detection of abnormal quality of raw water at intake pump station (caused by contamination by poison)	Tabletop exercise
	Treatment of leakage (considering accidents causing injury)	Tabletop exercise
	Training for dispatching support staff (emergency supply of water)	Field training
	WS on case studies, 17cases	WS

Conclusion

- Participatory planning in development of comprehensive risk and crisis management plan
- Policies/measures to ensure preparedness for natural disasters
  - ✓ ***Establishment of a support system***
  - ✓ ***Development of information system***
  - ✓ ***Vulnerability reduction of the facilities***
- Preparation of manuals and field training, tabletop exercises
- ***Increase awareness of impending crisis and develop faculties for crisis emergency response***

Thank you for your attention