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First Ranking **Professional Company** for the
Technology of Safe Environment to **Make Clean Future**”



The issue of environmental pollution on earth in our modern society has threatened the sustainable prosperity of human beings. Now is the era of an ample necessity of the technical advancement in the field of safety and environmental preservation. KUMKANG Engineering, as "the first ranking professional company for the technology of safe environment", has procured excellent technicians with rich experience.

We have been equipped with a competency to provide the best technical service regarding the technology of safe environment through accurate prediction and optimum technology on the basis of analysis data accumulated for long years.

KUMKANG Engineering will become a good community company that contributes to the human society through the technology of safe environment.

C.E.O / Ph.D in Engineering *Young Sun Young*



Progressive Innovative
Development of Company Culture



Social Development and Individual
Growth in Harmony



Complete Social Responsibility for
Environmental Preservation



**Management
Ideology**



Realization of Human Centered
Participatory Management

Company Outline

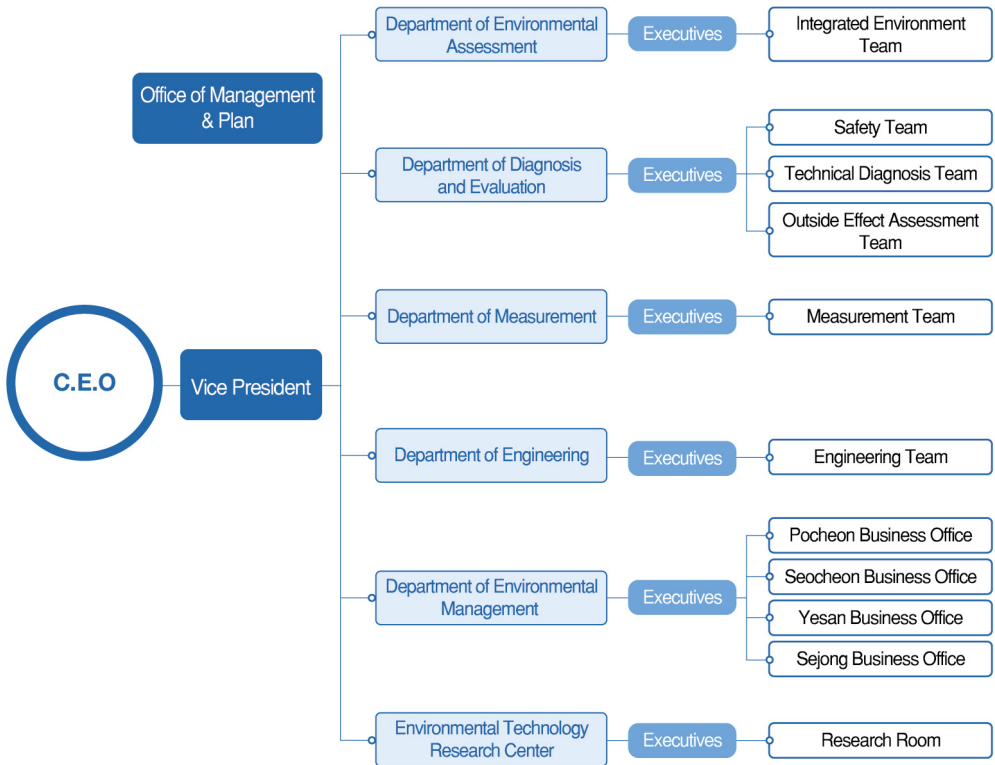
- **C.E.O** Chung Sun-Yong
- **Established Date** September in 1997
- **Business License** Preparation of outside effect assessment / Preparation agency for PSM
Professional agency for technical diagnosis / Environmental consulting company
Measurement agency / Management agency
Professional environment construction (water, air) /
Public sewage system (over 10,000 tons) / Sewer
Agency for the management in measurement device / Private sewage
Agency for the management in livestock feces treatment facility /
Agency for biotoxicity test
- **Website** www.kkeng.co.kr

Major History

- **1997** Established KUMKANG Engineering Co., Ltd
- **1999** Received a permit to establish an auxiliary research center
- **2002** Received the certificate of ISO 14001
- **2007** Received the certificate of venture company/INNOBIZ
- **2008** Received the certificate of an excellent agency for human resources development
- **2009** Registered the active subject of engineering (Designated as an operator for engineering business)
- **2014** Received the certificate of small hidden company
- **2017** Received the certificate of a youth-friendly small hidden company
- **2018** Received the certificate of Chungnam Star Companies

Major Works

- **Environment Safety Diagnosis Consulting**
Integrated Environment Management Plan, Environment License and Permit Consulting, Outside Effect Assessment, Hazard Management Plan, Installation Inspection, Business Permit, Hazard Risk Prevention Plan, Process Safety Management (PSM), Technology Diagnosis
- **Self Measurement Agency**
Measurement & Analysis of Pollutants (water, air), Biotoxcity Analysis
- **Environment Facility Management Agency**
wastewater / Air / Private sewage / Public Wastewater Treatment Facility /
Public Sewage System (over 10,000 tons) / Sewer
- **Environment Pollution Prevention Facility**
Water / Air Prevention Facility, Nonpoint Pollution Source Reduction Facility, Comprehensive test drive
- **Environmental Technology Research Center**
Patent, procured technology, electrochemistry



Departments Guide

Departments	Contact information	Departments	Contact information
Office of Management & Plan	070-8915-3716, 3718	Engineering Team	070-8915-3715, 3830
Measurement Team	070-8915-3713, 3728	Outside Effect Assessment Team	070-8915-3712, 3835
Technical Diagnosis / Safety Team	070-8915-3714, 3709	Integrated Environment Team	070-8915-3724, 3833
Environmental Technology Research Center	070-8915-3717, 3702	Department of Environmental Management	070-8915-3805



Conviction, Passion, Cooperation

As a man of environmental concern, a talented personnel of humanity and morality possesses a personality to build up trust through honest and integrity.

Enthusiastic Learning, Self Development, Insatiable Growth

Talented personnel who possesses professional capability to pursue ceaseless learning and change based on solid dream and passion to become the best in his own field.

Progress, Innovation, Open Mind, Creativity

Talented personnel who tries to create new values of the company in a creative society with confidence, creative idea, and challenging spirit to lead the changes in 21th century.

Technical Manpower

- Engineer(Water, air, electricity, machinery)
- Technician(Water, air, chemical engineering, civil engineering, waste)
- Industrial Technician(Water, air)
- Certified Technician(Chemical analysis)



Consulting of Environment, Safety, and Diagnosis

- Environment Consulting
 - Integrated Environmental Management Plan
 - Environment Permit
- Safety Consulting
 - Outside Effect Assessment
 - Hazard Management Plan
 - Installation & Inspection
 - Business Permit
 - Hazard Risk Prevention Plan
 - Process Safety Management (PSM)
- Technical Diagnosis
 - Public Sewage
 - Public Wastewater
 - Sewage Pipeline

Electrochemistry, R&D

- Patent
- Holding Technology
- Electrochemistry

Measurement and Analysis of Pollutants

- Water
- Air
- Ecological Toxicity

Public Sewage Management Agency

- Wastewater
- Air
- Private Sewage
- Public Wastewater Treatment Facility
- Public Sewerage
- Sewerage

Design and Construction, and Test Drive of Environmental Pollution Prevention Facilities

- Water Pollution Prevention Facility
- Air Pollution Prevention Facility
- Non-Point Pollution Source Reduction Facility

Outline

The environmental management system that comprehensively analyzes the effect of pollutants on the environment and minimizes the pollutants in entire business site through possible economic means (optimum available technique)

Relevant law : Article 6 in the law of integrated management in environmental pollution facility (Integrated permit)

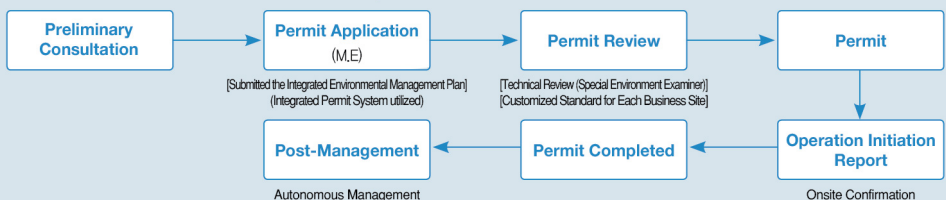
Integrated Management Target and Application Period

- First and second class business sites for air or water in 19 business types
(Annually more than 20 tons of generated air pollutants, business sites with more than 700m³ daily wastewater discharge)
- New business sites : Implemented by stage for five years since 2017
- Previous business sites : Integrated permit within 4 years of grace period from the implementation date for each business

Application Period	Target Businesses
2017. 1. 1	<ul style="list-style-type: none"> • Among electricity businesses (351), thermal power generation business (35113), other electric generation business (35119) • Supplier of steam, hot & cold water, and air control(353) • Among waste treatment businesses (382), unspecified waste treatment (3821), specified waste treatment (3822) ※ Excluding the facility business for landfills
2018. 1. 1	<ul style="list-style-type: none"> • Among manufacturers of basic chemical substances (201), petrochemistry (20111) • Among manufacturers of synthetic rubber (203), synthetic rubber (20301), other plastics (20302) • Primary steel making business (241) • Primary non-ferrous metal manufacturer (242)
2019. 1. 1	<ul style="list-style-type: none"> • Manufacturer of petroleum refining product (192)/ Manufacturer of fertilizer & nitrogen compound (202) • Among manufacturers of basic chemical substances (201), inorganic chemistry (20129), mineral pigment (20131), organic chemistry (20119), synthetic dye (20132) • Among manufacturers of other chemical products (204), agricultural pesticides (20412), paint (20421), enamel (20422), surfactant (20431), toothpaste, soap (20432), cosmetics (20433), refined salt (20492), adhesive (20493), gunpowder (20494), others (20499)
2020. 1. 1	<ul style="list-style-type: none"> • Among pulps (171), pulps (1711), newspapers (17121), printing papers (17122), cardboard (17123), other papers (17129) • Manufacturer of other papers & cardboard product (179) • Among electronic parts (262), plate (2621), circuit board (26221), storage battery (26292), other electronic parts (26299)
2021. 1. 1	<ul style="list-style-type: none"> • Slaughter, meat processing & storage business (101) • Manufacturer of alcoholic drinks (111) • Textile product dye, arrangement & finishing processing (134) • Manufacturer of plastic products (222) • Manufacturer of semi-conductor (261) • Manufacturer of auto parts (303)

※ The classification of business types is based on the standard industry classification table notified by the Minister of the Department of Statistics Korea

Permit procedure for the discharge facility of environmental pollutants





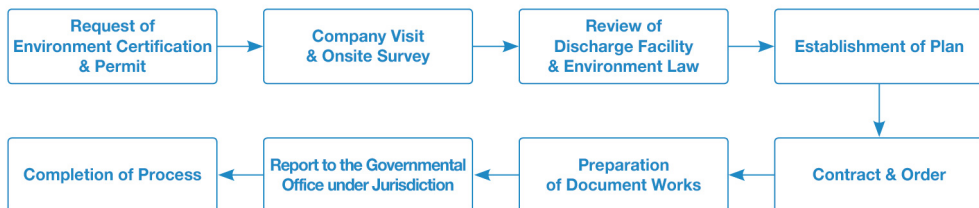
Outline

- Review of a target for the environment permit of a facility to install at the business site (Review other laws beside the environment law simultaneously : Industry Safety Health Law, Chemical Substance Control Law, etc)
- Review of the location limit and restriction of business site
- Computation for the amount of discharge gas and types of pollutants generated in each discharge facility
- Selection and design of the prevention facility to remove pollutants for each discharge facility
- Environment related post-management necessary in the operation of business site

Business Areas

Areas	Types of Certificate and Permit
Air	<ul style="list-style-type: none">• Installation permit for air discharge facility (installation report), permit change (Report of change)• Report of a business that generates scattered dust• Report of the installation (change) of a discharge facility for scattered dust• Report of the installation of a discharge facility for volatile organic compound (Report of change)
Wastewater	<ul style="list-style-type: none">• Permit for the installation of wastewater discharge facility (Report of installation), Permit change (Report of change)• Installation report of a no-point pollution source (Report of change)• Installation report of other source of water pollution
Foul smell	<ul style="list-style-type: none">• Report of the installation & operation of a discharge facility for foul smell (Report of change)
Wastes	<ul style="list-style-type: none">• Business plan for waste treatment (Change)• Permit application of waste treatment business (Change of permit, report of change) <Collection & transportation business, recycling business>• Report of the installation of waste disposal facility or recycling facility (Report of change)
Noise & vibration	<ul style="list-style-type: none">• Application of installation permit for noise & vibration discharge facility (Report of installation), report of change

Work Procedure



Outline

A person who wants to install and operate a treatment facility for hazardous chemical substance shall prepare a preliminary assessment on outside effect that evaluates the effect on man or environment near the business site due to chemical accident and submit it to the person in charge of safety.

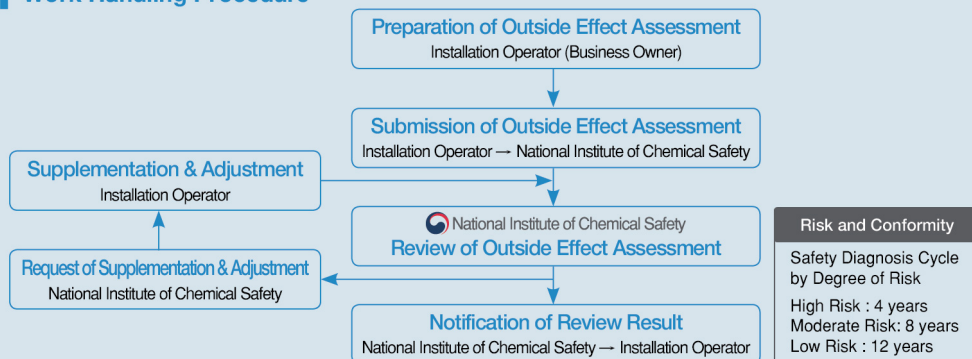
Submission Target

- Person who wants to install and operate a treatment facility for hazardous chemical substances
Excluding a laboratory in the Article 2-2 of 「Laboratory Safe Environment Composition Law」

Submission period

- New facility** : Implemented from January 1, 2015
Submitted 30 days before starting the installation of corresponding facility
- Previous facility** : Implemented the expansion by stage according to the progress regulation (5 years)
 - If it corresponds to a business target between the submission target of SMS and the submission target of PSM : By December 31, 2015
 - Handling annually more than 1,000 tons of hazard risk substances among the submission targets of PSM : By December 31, 2016
 - Handling annually less than 1,000 tons of hazard risk substances among the submission targets of PSM : By December 31, 2017
 - Handling annually more than 100 tons of hazardous chemical substances : By December 31, 2018
 - Handling annually less than 100 tons of hazardous chemical substances : By December 31, 2019

Work Handling Procedure



Major Details of Outside Effect Assessment

- Basic Assessment Information**
 - Business Site & Facility
 - List of Chemical Substances and Information of Hazard
 - List and Details of Handling Facility
 - Process Information & Drive Procedure, etc
 - Location Information of Handling Facility
 - Location Information of Surrounding Area
 - Weather Report
- Outside Assessment Information**
 - Analysis on Process Risk
 - Selection of Accident Scenarios (Worst / Alternative Scenario)
 - Assessment of the Effect on Surrounding Area of Business Site
 - Measure to Procure Safety
- Relevant Information with Other Laws



Outline

System to evaluate the potential risk of handling substances and facility at the business site that handles above the appointed quantity of substances in preparation for accident; and to prepare a possible emergency reaction system at the time of chemical accident and minimize the damage from the chemical accident.

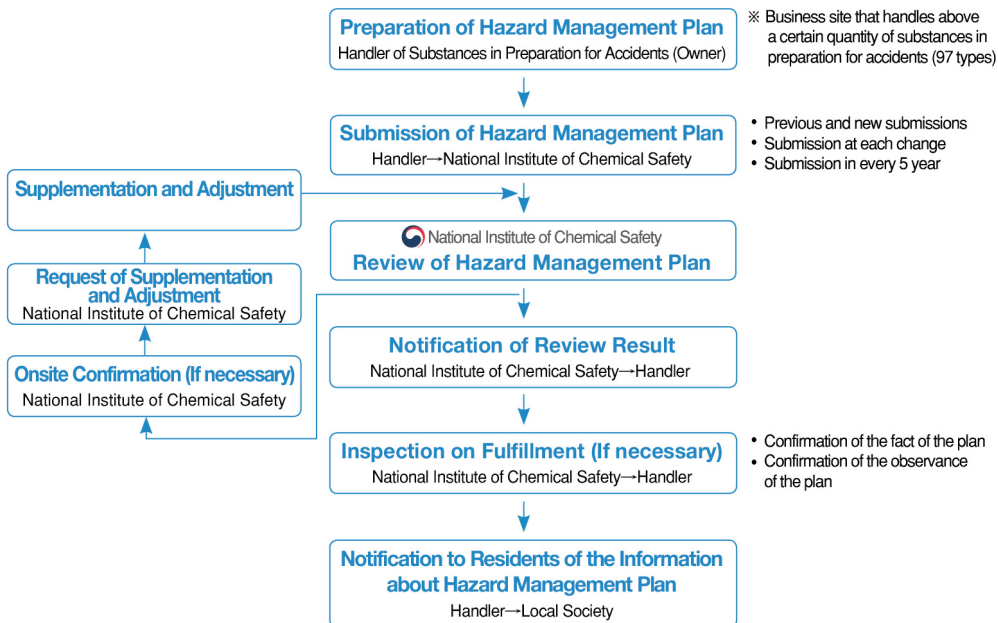
Submission Target

- Business site that handles above the appointed quantity of substances (97 types) in preparation for accidents according to the attached Table 10 of the enactment regulation of Chemical Substance Control Law

Submission Period

- **New facility** : Implemented from January 1, 2015
Complete before the application of business permit for hazardous chemical substances
(Submit every 5 year after the initial submission)
- **Previous facility** : Implement the expansion by stage according to the progress regulation (5 years)
 1. If the facility corresponds to a business type between the submission target of SMS and the submission target of PSM : By December 31, 2015
 2. If the facility handles above the regulated quantity of hazard risk substances among the submission targets of PSM : By December 31, 2016
 3. If the facility is the target for hazard management plan which is not the targets of SMS and PSM : By December 31, 2017

Work Handling Process



Outline

System to evaluate the safe design of equipment and device and the observance of installation and arrangement standard to strengthen the safety of business site

Target

- Person who wants to install and operate a handling facility for hazardous chemical substances

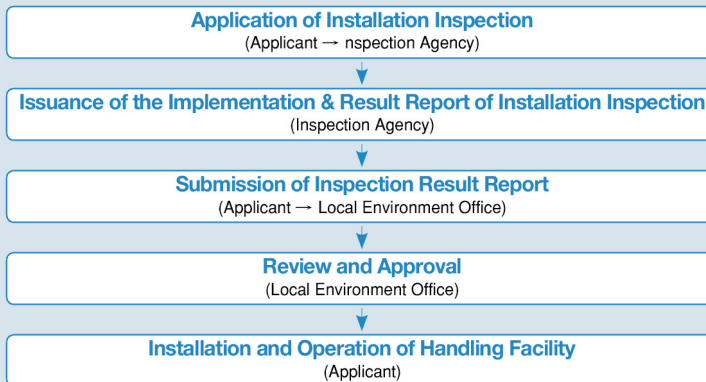
Submission Period

- After the complete installation of the handling facility for hazardous chemical substances and before the operation of corresponding facility

Submitted Documents

- Application for Inspection
- Preliminary written inspection data
 - Plan for the installation of facility
 - Blueprint for facility
 - Data to prove that the basis and facility of applied standard have been designed conforming to the standard at the time of facility design
 - Self inspection report and photos to prove that the facility conforms to the inspection standard for the matters that are not possible to confirm after the installation

Installation Inspection



Inspection Agency



Business Permit



Target

- Person who wants to start business of hazardous chemical substances

Submission Period

- Before starting business of hazardous chemical substances

Submitted Documents

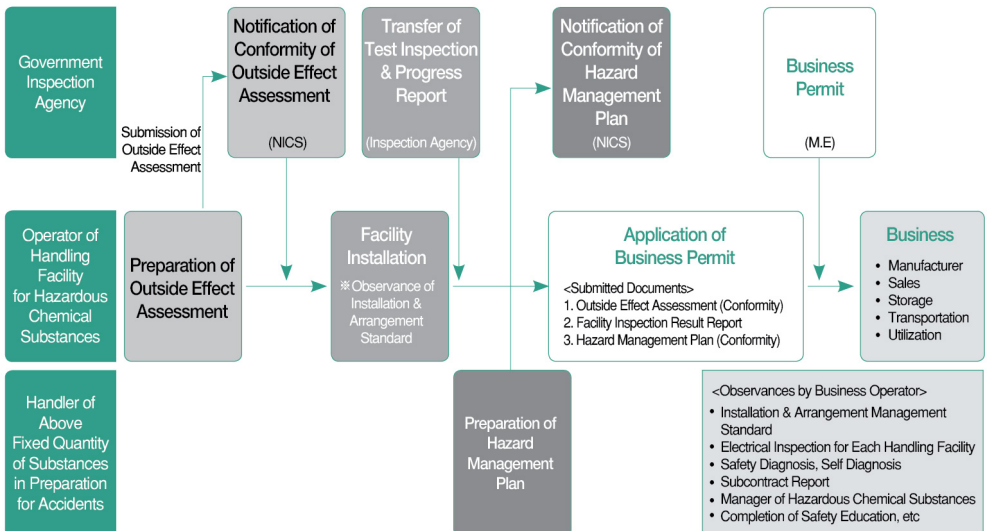
- Application for Permit
- Outside Effect Assessment that has received a notification of conformity
- Hazard management plan that has received a notification of conformity
- Inspection result report that has received a judgment of conformity
- Data regarding annual expected handling quantity of hazardous chemical substances
- Details of handling facility for hazardous chemical substances
- Details of equipments and technicians for hazardous chemical substances
- Permit or copy of transportation business for freight trucks(Transportation business)

Approval Period

- Within 15 days after the submission of documents

Approval Agency

- Local environment office under jurisdiction



Hazard Risk Prevention Plan

Outline

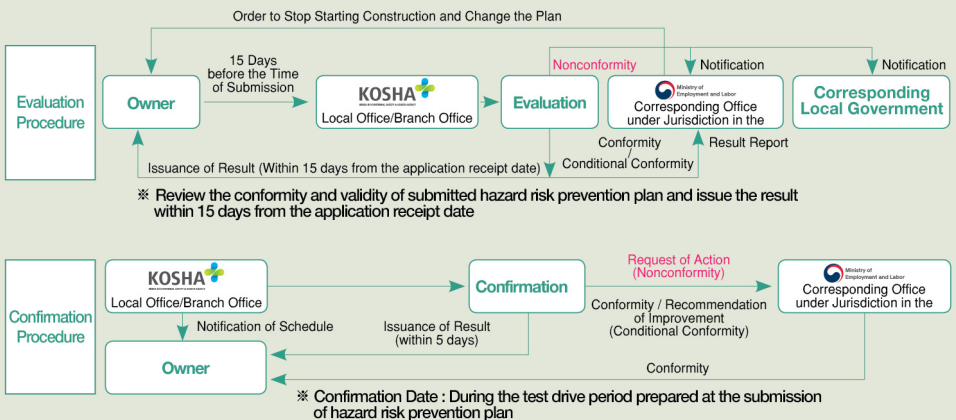
System to receive the preliminary evaluation on safety and secure the safety fundamentally and contribute to the prevention of industrial disaster and the maintenance and enhancement of safety and public health of workers when entire construction machines, apparatus and equipments directly related to the production process are newly installed or moved from the business site or parts of major structure are modified. ※ Exempted if the Process Safety Memorandum (PSM) is submitted

Relevant law : Article 48 of Industrial Safety Health Law (Submission of a Hazard Risk Prevention Plan, etc)

Targets

Classification	Standard	Target Business Site or Equipment
Target Business Type	<ul style="list-style-type: none"> Over 300kw electricity contract capacity If entire construction machines, apparatus and equipments directly related to the production process are newly installed and moved or parts of major structure are modified. 	<ol style="list-style-type: none"> 1. Manufacturer of metal process products (Machines & furnitures are excluded) 2. Manufacturer of nonferrous mineral products 3. Manufacturer of other machines and equipments 4. Manufacturer of automobile & trailer 5. Manufacturer of foods 6. Manufacturer of rubber products and plastic products 7. Manufacturer of lumber and wooden products 8. Manufacturer of other products 9. Manufacturer of primary metals 10. Manufacturer of furnitures 11. Manufacturer of chemical substances & chemical products 12. Manufacturer of semi-conductor 13. Manufacturer of electronic parts
Target Equipments	When five equipments at the business site of all business types are installed, moved or modified	<ol style="list-style-type: none"> 1. Melting furnace of metals or other minerals (over 3 tons capacity) 2. Chemical equipment 3. Drying equipment (Above 50kg/hr of maximum fuel consumption or above 1,000kg of maximum power consumption) 4. Gas aggregation welding apparatus (Inflammable gas aggregation amount above 1,000kg) 5. Equipment in relation to the hazardous substance of permit target and management target and the dust work
Ventilation Equipment	Equipment in Relation to the Hazardous Substance of Permit & Management Target and the Dust Work	<ol style="list-style-type: none"> 1. 49 types of target substances for safety inspection (Ventilation amount with more than 60m³/minute) 2. Substance of permit target or management target (Ventilation amount with more than 150m³)

Work Procedure





Outline

System to prepare and submit the process safety report for evaluation and receive the confirmation to prevent critical industrial accident at the business site that procures hazard risk equipments

※ **Critical Industrial Accident** : Relevant law regarding the accident that may cause immediate damage on workers within the business site or damage on the nearby area of the business site due to the leak, fire and explosion of risk substance from the hazard risk equipments: Submission of the process safety report in the Article 2-2 of Industrial Safety & Health Law

Relevant law : Submission of the process safety report in the Article 2-2 of Industrial Safety & Health Law

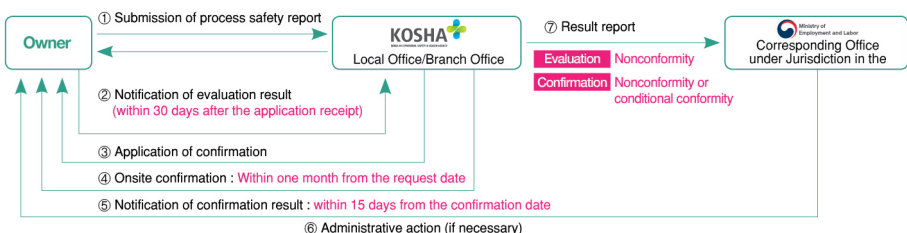
Targets

- 7 business types (Article 33-6 in the Enactment Order of Industrial Safety & Health Law)
 1. Crude oil refinery
 2. Reprocess business for other refined petroleum oil
 3. Manufacturer of basic chemical substances in petrochemistry or manufacturer of synthetic resin and other plastic substances
 4. Manufacturer of nitrogen, phosphate and carlyle fertilizer(Excluding the manufacturer of phosphate and carlyle fertilizer)
 5. Manufacturer of complex fertilizer (Excluding simple blending or mixture)
 6. Manufacturer of agricultural pesticide (Corresponds only to the manufacturing of technical ingredient)
 7. Manufacturer of gunpowder and firework products
- Business site that retains the equipment to manufacture, handle and store above the regulated quantity of hazard risk substances
 - ※ **Hazard risk substance** : 51 types of inflammable gas, fluorine, sulfuric acid, hydrogen, and nitrogen, etc which are above the daily regulated quantity

Submission Period

- Installation, movement, and modification of major structural parts : 30 days before starting the construction

Work Procedure



Technical Diagnosis for Public Sewage

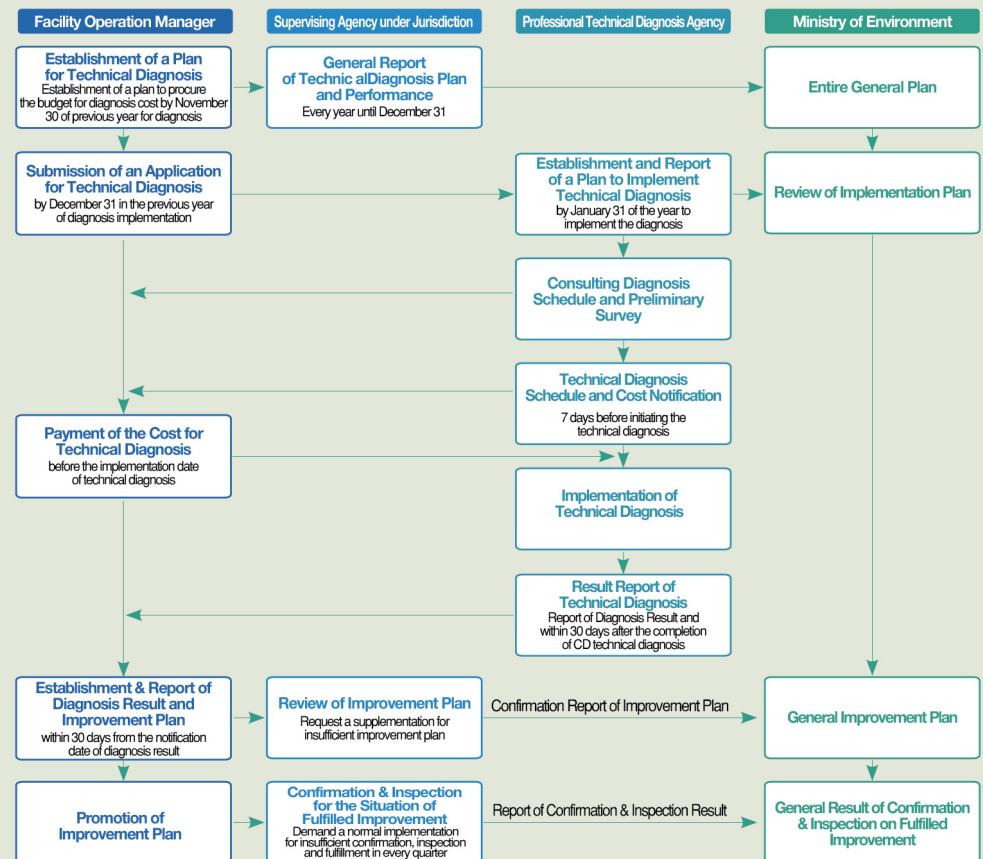
Outline

Technical diagnosis should be implemented every five year for public sewage and public wastewater facilities in accordance with the sewage law and the water ecology preservation law. Fine will be imposed on none implementation.

Targets

1. Public sewage treatment facility with more than 50m³/day
2. Sewer
3. Sewage undercurrent facility
4. Feces treatment facility
5. Public wastewater treatment facility
6. Foul smell discharge facility
7. Waste treatment facility

Work Procedure



Outline

- Implement several national R&D projects in the area of environment with the professional manpower in the field of R&D and an established auxiliary research center
- Operate the laboratory with the basis of various research facilities and equipments

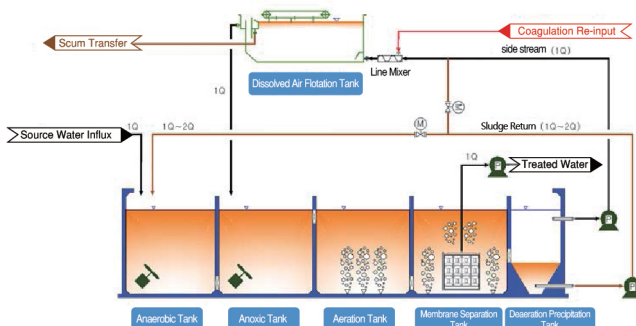
Patents

01. Water Treatment Method that Uses a Reaction Tank Including PBAC Carrier (No. 0502957)
02. Water Treatment Method that Uses a Carrier of Polyvinyl Alcohol Complex for Fixed Microorganism (No. 10-0691739)
03. Production Method of Electrodes for Sewage Wastewater Treatment (No. 10-0898173)
04. Sewage Wastewater Treatment System Using Electro-Coagulation and Precipitation (No. 10-0950729)
05. Tertiary Treatment System for Sewage Wastewater Equipped with Plasma Electric Discharge Tank (No. 10-1126871)
06. Tertiary Treatment System for Sewage Wastewater Equipped with Plasma Electric Discharge Tank
(PCT Patent: Japan, No. 5404930)
07. Tertiary Treatment System for Sewage Wastewater Equipped with Plasma Electric Discharge
(PCR Patent: China, No. 1352861)
08. Tertiary Convergence Treatment System of Sewage Wastewater (No. 10-1352939)
09. Water Treatment Equipment and Its Method (No. 10-1499539)
10. Hybrid Membrane Cleaning System (No. 10-1499539)
11. Production Method of Nitrate Nitrogen Reducing Agent (No. 10-1558040)
12. Treatment Technology for Ionic Substances in Water System (No. 10-1615124)
13. Treatment System for High Concentration Sewage Wastewater (No. 10-1728866)
14. Wastewater Treatment Method that Uses an Electrolysis Wastewater Treatment System (No. 10-1784299)
15. Condenser Type Deionization Process with the Application of Ion Exchange Membrane to Increase the Efficiency of Desalination (No. 10-1820927)
16. Treatment System for Open Plane and Dissolved VOCs (No. 10-1926540)
17. Treatment of Volatile Organic Compound Available to Control Hydrogen Concentration (No. 10-1972820)
18. Equipment to Remove VOCs inside Wastewater (No. 10-2023660)

Procured Technology

Tertiary Treatment for Sewage & Wastewater

The present technique is a tertiary treatment process for sewage and wastewater treatment that can respond to the Total Phosphorus (T-P) standard through the convergence and reinforcement of previous MBR process and chemical treatment (dissolved air flotation); and improve the flux of separation membrane to reduce the initial investment and the cost for maintenance and management.



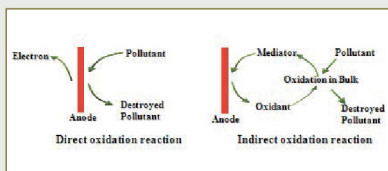


Electrochemistry

- Principle : Apply DC in water to remove pollutants by the electrochemical reaction of anode and cathode plates
- Retained Technology : Electrolysis
Electrocoagulation / Precipitation

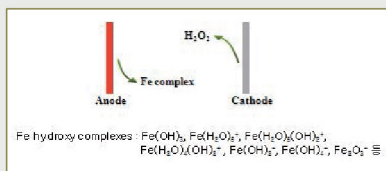
Electrolysis

Electrolysis T-N using insoluble electrode (IrO₂/Ti),
Remove chromaticity



Electrolysis

Electro-coagulation using soluble electrode (Fe, Al)
Remove colloid, heavy & light metal, and organic substances



Advantages

- ✓ Selection of the electrode with low surface resistance
- ✓ Selection of the electrode with excellent reactivity
- ✓ Selection of Titanium Annealing Process

Reduction of energy cost
Improvement of treatment efficiency
Improvement of durability

Application Areas

- Dyeing Wastewater: Remove chromaticity, non-biodegradable organic substance, and nitrogen
- Plating Wastewater: Recovery and treatment of various mixed heavy metal
- Livestock Wastewater: Remove chromaticity and nitrogen
- Sterilization: Sterilize ballast water and simple water supply
- Other: Tertiary treatment of industrial wastewater

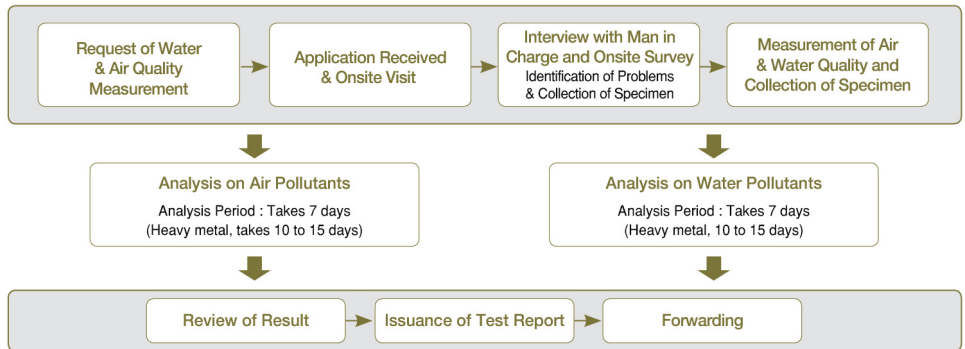


Self Measurement Agency (Air, Water)

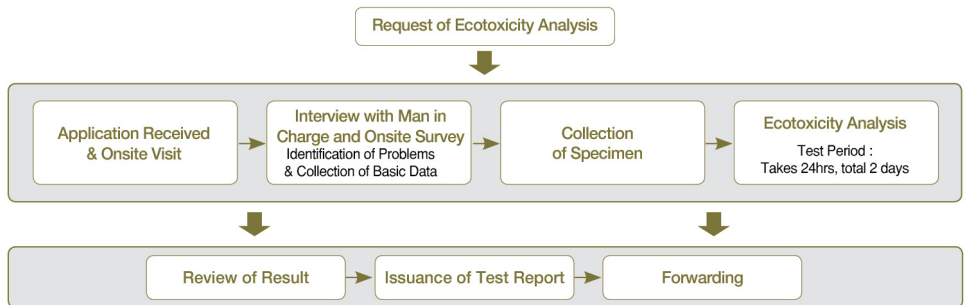
Outline

Based on excellent technical manpower with rich experience in the area of measurement and analysis, measuring devices, and experiment equipments, a thorough service shall be provided to satisfy customers' demand.

Procedure for Self Measurement Agency Work



Procedure for Analysis Work on Ecotoxicity



What is Ecotoxicity Control System?

Currently, it is difficult to set and control each discharge permit standard for all hazardous chemical substances contained in industrial wastewater as types of hazardous chemical substances have increased rapidly due to the industrial development. Accordingly, an Ecotoxicity Control System has been introduced to create a healthy water ecosystem by using organisms and controlling the toxicity of hazardous chemical substances discharged through sewage wastewater.

-The ecotoxicity is expressed as the degree of toxicity with a Toxic Unit (TU) that affects the water flea of experiment organism.



Measurement of Air Pollutants

- In accordance with the Article 39 of Air Environment Preservation Law, act as an agency of the self measurement for the discharge facility and prevention facility for air pollutants
- Act as an agency of the self measurement of air for various industrial companies and public institutions
- Measure the air pollutants for each process

Relevant Laws

- Air Environment Preservation Law Article 39 Clause 1 (Self Measurement)
- Air Environment Preservation Law Enactment Regulation Article 52 (Target & method of self measurement, etc)

Target, Item and Method of Self Measurement (Related to Article 52 Clause 3)

Classification	Size for Each Discharge Hole	Business site that does not automatically transfer to the control center	Automatic transfer to the control center, none installation of an automatic measuring device through chimney (Measure the back end of the prevention facility only)	Automatic transfer to the control center, none installation of an automatic measuring device through chimney (Measure the back end of the prevention facility only)
Type 1 Discharge Hole	Discharge hole with the sum of annual generation amount of more than 80tons of dust, sulfur oxide and nitrogen oxide	Every week more than 1 time	Every 2 weeks more than 1 time	Every month more than 1 time
Type 2 Discharge Hole	Discharge hole with the sum of annual generation amount of more than 20 tons and less than 80 tones of dust, sulfur oxide and nitrogen oxide	Every month more than 2 times	Every month more than 1 time	Every 2 months more than 1 time
Type 3 Discharge Hole	Discharge hole with the sum of annual generation amount of more than 10 tons and less than 20 tones of dust, sulfur oxide and nitrogen oxide	More than one time in every 2 months		Every quarter more than 1 time
Type 4 Discharge Hole	Discharge hole with the sum of annual generation amount of more than 2 tons and less than 10 tones of dust, sulfur oxide and nitrogen oxide	More than one time in every six months		
Type 5 Discharge Hole	Discharge hole with the sum of annual generation amount of less than 2 tones of dust, sulfur oxide and nitrogen oxide			

Measurement of Water Pollutants

- Act as an agency for the self measurement of water pollutants in accordance with the Article 46 of Water Quality & Water Ecosystem Preservation Law
- Act as an agency for the self measurement of water quality in various industrial companies, analysis on water quality of sewage water and stream water
- Experiment in the efficiency of wastewater treatment (Pilot-Test)

Relevant Law

- Water Quality & Water Ecosystem Preservation Law Article 46 (Measurement of water pollutants)

Classification of Business Site by Size (Related to Article 44 Clause 2)

Classification	Size for Each Discharge Hole	Number of Measurements
Class 1 Business Site	Business site with the daily wastewater discharge amount of over 2,000m ³	The cycle and number of measurement are not specified by recommended regulation
Class 2 Business Site	Business site with the daily wastewater discharge amount of more than 700m ³ and less than 2,000m ³	
Class 3 Business Site	Business site with the daily wastewater discharge amount of more than 200m ³ and less than 700m ³	
Class 4 Business Site	Business site with the daily wastewater discharge amount of more than 50m ³ and less than 200m ³	
Class 5 Business Site	Discharge facility which does not corresponds to the business sites from the class 2 to class 4	

Agency for Environmental Facility Management

Outline

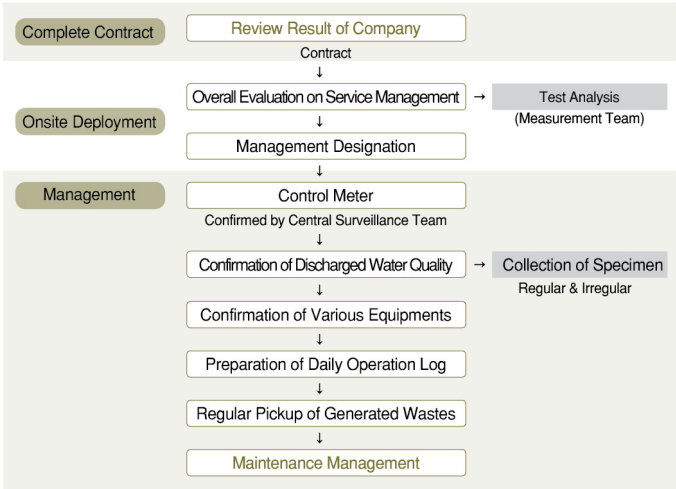
Based on the analysis technique and management data accumulated for several years with a purpose of optimum management measure for the characteristic of each consigned management area at environmental pollution prevention facility, cost reduction and safety shall be guaranteed through the reliable work implementation.

(Public sewage treatment system/Wastewater/Air/Private sewage/Public wastewater final treatment system/Sewer)

Water Quality Consigned Management Procedure

Agency for Management in Wastewater Prevention Facility

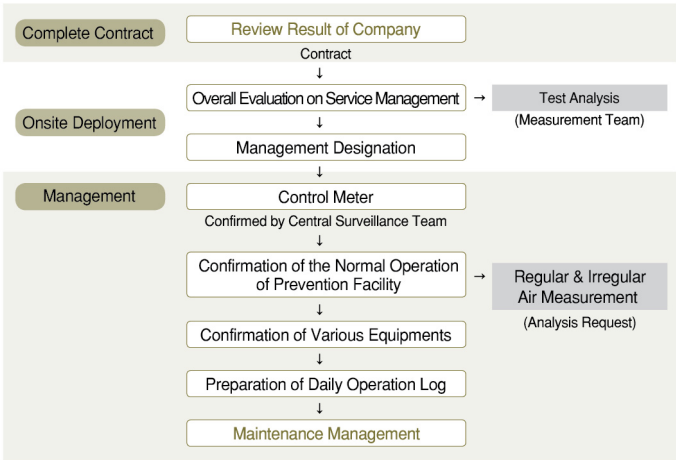
To implement a general agency work for water quality & environment management in accordance with the Normal Operation, Maintenance and Management of Water Pollution Discharge Facility and Prevention Facility and the Article 8 (Discharge Permit Criteria) and Article 23 (Environment Manager) of Water Quality & Environment Preservation Law, and the Article 44 of enactment rule in the same law



Air Consigned Management Procedure

Agency for Air Prevention Facility Management

In accordance with the normal operation, maintenance and management of air pollution discharge facility and prevention facility, the Article15 (Management of discharge facility& prevention facility) of the Air Environment Preservation Law, the Article 24 (Environment manager), and the Article 60 of enactment rule in the same law (Observation & management by environment manager), and No. 5328 of Special Measure for the Relaxation of Regulation on Company's Activities, it has a purpose to implement the management consigned as an agency for the air pollution prevention facility.





Public Sewage Treatment Facility

A stable management work has been implemented through strict maintenance and management for equipment operation, water quality management and treatment facility (equipments) by the procurement of a stable quality of discharging water, the establishment of an operation plan and the systematic implementation of work report

Facility Operation & Water Quality Management

- Standardization & Computerization of Works
- Data Base Creation of Various Management Data
- Development & Application of Management Skill
- Improvement in Water Quality

Maintenance & Management of Treatment Facility

- Inspection on Equipments / Systemization of Maintenance Method
- Computer Management of History Management Card for Equipments
- Maintenance & Management Method for Equipments and Observance of Exchange Cycle

Dispatch of Excellent Professional Technicians and
Composition of Effective Management Organization

Preservation of
Water Resource
and Nature Ecology
by Improvement in
Treatment Efficiency

Dispatch of Excellent Professional Technicians and
Composition of Effective Management Organization

Establishment of Emergency Management System

- Establishment of a Preparation Plan for Water Pollution Accident
- Establishment of a Countermeasure at the Time of Electric Power Failure
- Establishment of a Measure for Water Quality Management in Preparation for Heavy Rain
- Establishment of a Prevention Measure for Fire and Safety Accident

System Improvement in Operation & Management

- Centralized Operation & Management
- Efficient Work Division and Organization Management
- Establishment of 24 Hr. Permanent Operation System for Each Field
- Study of Improvement Measure for Treatment Efficiency

Prevention Facility for Environmental Pollution

Outline

We have put an effort to select and apply accurate prediction and optimum environmental pollution treatment method based on the data from the measurement and analysis of environmental pollutants accumulated for several years; procure excellent technicians with rich experience in design and construction of best environmental pollution prevention facility based on rich performance through the implementation of many constructions; provide optimum alternatives regarding the environmental issue through the provision of the best technical service; contribute to human and society through the environmental technology.

Air Pollution Prevention Facility



Bag Filter

Diverse business sites with large fine size of particles



Wet Scrubber

Business site with the generation of diverse water soluble hazardous gas and business site with the generation of dust at high temperature and humidity



Activated Carbon Tower

Business site with petrochemistry, coating, and paint booth and business site with the generation of various foul smells



Bio Filter

Sewage and feces treatment plant, business site with the generation of VOC, business site with the generation of other foul smell

Water Pollution Prevention Facility



Physical & Chemical Treatment Facility

Preliminary treatment of inorganic wastewater and organic wastewater



Microorganism Treatment Facility

Use a long term activated sludge method, a contact oxidation method, and a SBR engineering method



Separation Membrane

Facility to separate solid from liquid without precipitation tank to use for recirculation



Conversion Type MBR

MBR + Dissolved Air Flotation



Nonpoint Pollution Source Reduction Facility

The nonpoint pollution source reduction facility removes or reduces water pollutants which are discharged from the nonpoint pollution source in the water quality pollution prevention facility.



The **nonpoint pollution source** is the pollution source that discharges unspecified water pollutants at unspecified places such as city, road, farmland, mountain area and construction site.

The nonpoint substance is the pollutant that is often discharged with early surface water at raining. Nonpoint substances are fertilizer or pesticide sprayed on farmlands, soil erosions, livestock spills, tire dust of automobile on road, residue in urban area, and air pollutants fell on the ground surface.



Nature Type

Undercurrent facility, artificial wetland, penetration facility, vegetation type facility



Equipment Type

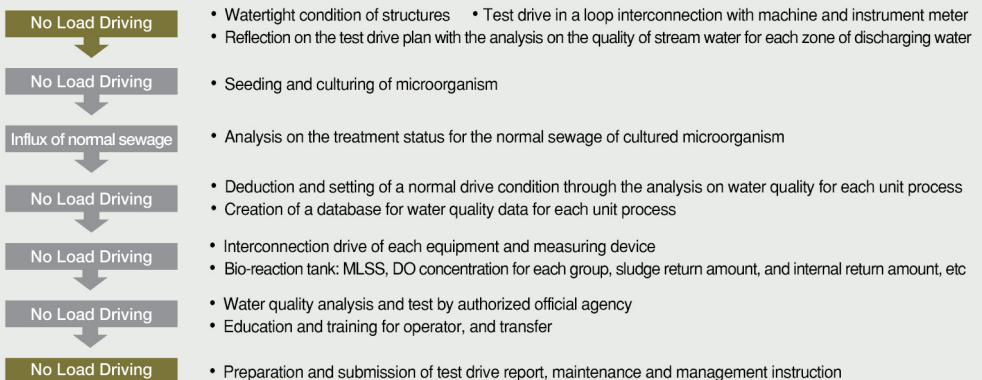
Filtration type facility, vortex type facility, screen type facility, coagulation precipitation type facility, biological treatment type facility

Comprehensive Test Drive

It is the process to check the normal operation of each mechanical equipment and drive to check its conformity in advance for installation purpose in order to demonstrate the normal performance regulated in the design for newly installed treatment facility.

Basic Plan for Comprehensive Test Drive

- Identification of an operation condition of facility for each unit process and confirmation of a function as a general plant
- Establishment of efficient process management and control system for an operator in the treatment plant
- Procurement of a performance for smooth maintenance and management after the initiation of normal drive
- Systematic transfer of equipments to the operator at the treatment plant and transfer of operation technology for tertiary treatment
- Additional review of various design factors and confirmation of treatment performance to satisfy the quality of discharged water





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