



**Applications in Oil and Fossil Fuel Market**  
**and Introduction to Gas Detectors and**  
**Alarms for Safety and Security**

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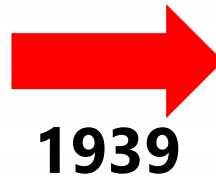
- **About Riken Keiki**
- **Why do we need gas detectors?**  
**Risks associated with toxic gases**
- **Applications in oil and fossil fuel market**
- **Major examples of accidents**
- **Product information**
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# About Riken Keiki

# About Riken Keiki



**RIKEN**



**Riken Keiki**



**Headquarters  
To be completed in September  
2018 (conceptual drawing)**

**Riken Keiki was originally established to commercialize and sell detectors for preventing explosions in coal mines and on oil tankers.**



# About Riken Keiki



**Methane gas measurements  
in coal mine**



**Optical Gas  
Indicator Model  
3 (1939)**

**Certification**

National heritage of  
analytical and scientific  
instruments  
2014



# Company profile



Company name	Riken Keiki Co., Ltd.	
Established	March 15, 1939	
Location	Headquarters:	2-7-6 Azusawa Itabashi-Ku, Tokyo
	Development Center:	2-3 Minamisakae-cho, Kasukabe-shi, Saitama
Factories	Hakodate-shi, Hokkaido; Sakurai-shi, Nara (affiliated company)	

## Headquarters



**To be completed in September 2018  
(conceptual drawing)**

## Development Center



# About Riken Keiki



## Headquarters (Itabashi-Ku, Tokyo)

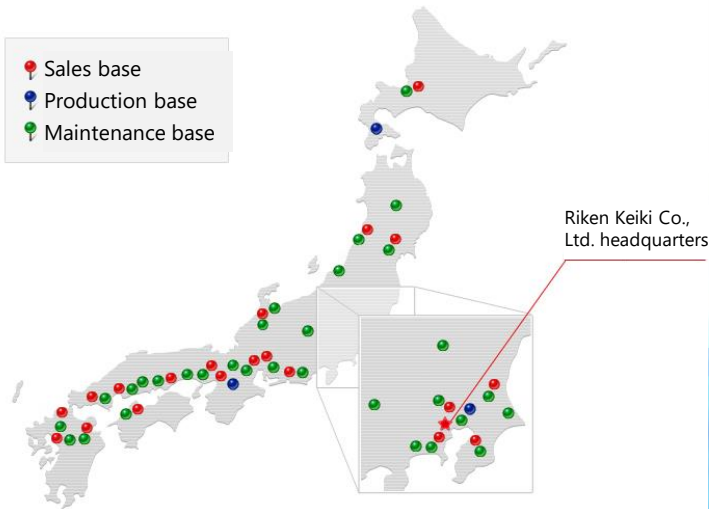


To be completed in September 2018  
(conceptual drawing)

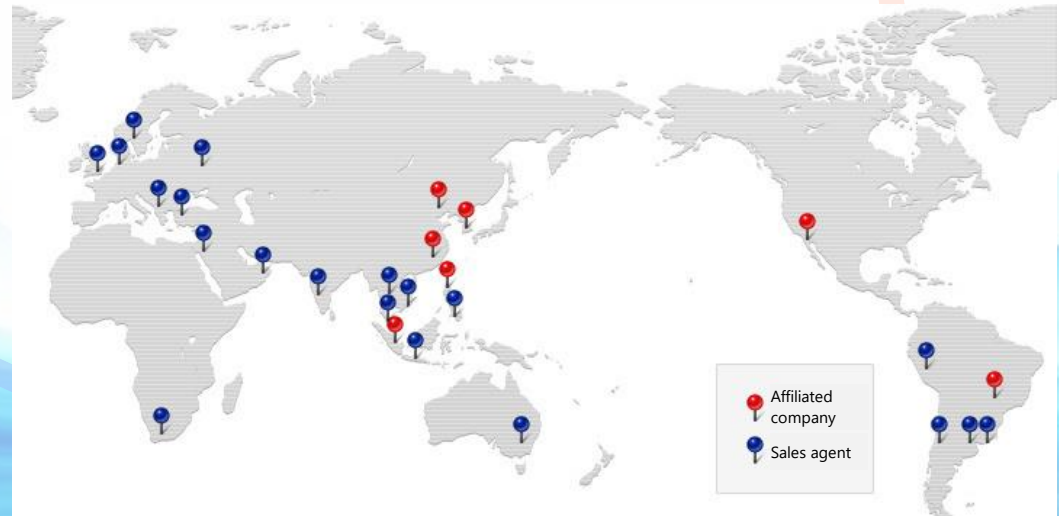
## Development Center (Kasukabe-shi, Saitama)



## Locations of sales offices ◆ Domestic ◆



## ◆ Global ◆



# Company profile



Various bases	Domestic sales and branch offices: 20 locations Service stations: 32 locations Global bases: 7 locations
Major sales items	Combustible gas detectors and alarms Gas detectors and alarms designed to prevent oxygen deficiency accidents Toxic gas detectors and alarms Combined gas detectors and alarms Various measuring instruments for environmental measurements and other instruments
Capital	2,565.5 million yen
Number of employees	965 (non-consolidated), 1,127 (consolidated) * As of September 30, 2017

**Hakodate Factory**  
(Hakodate-shi, Hokkaido)



**Nara Factory**  
(Sakurai-shi, Nara)





# Company history



<b>1939</b>	Riken Keiki Co., Ltd. established to produce and sell optical gas detectors, photoelasticity apparatuses, and other precision instruments invented and developed by RIKEN
<b>1959</b>	Start production and sale of combustible gas alarms and detectors (catalytic combustion type).
<b>1967</b>	Start production and sale of oxygen measuring instruments (OX-1).
<b>1970</b>	Start production and sale of monitoring tape type measuring instruments (FP-200).
<b>1972</b>	Start production and sale of non-dispersive infrared measuring instruments (RI-550).
<b>1975</b>	Start production and sale of electrochemical type measuring instruments (EC-231).
<b>1986</b>	Start production and sale of photoemission yield spectrometers (AC-1).
<b>2009</b>	70th anniversary of founding
<b>2014</b>	Start production and sale of portable X-ray diffractometers equipped with XRF (DF-01).
<b>2015</b>	Start production and sale of portable multi gas detectors (GX-6000), first product of its kind in Japan capable of housing photoionization detectors (PID).



RIKEN KEIKI

# **Why Do We Need Gas Detectors? Risks Associated with Toxic Gases**

# Need for gas detectors (combustible gases)

- **Criteria set by United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS)**

According to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS), a combustible gas (or flammable gas) is defined as follows:

**A combustible or flammable gas is a gas having an explosive (flammable) range when mixed with air under atmospheric conditions of 20°C and standard pressure of 101.3 kPa.**

Gases falling under this definition are further subdivided into the following two categories based on the severity of the associated risk:

**Category 1 (Danger: Extremely flammable gas)**

Gases capable of igniting at 20°C and standard pressure of 101.3 kPa when occurring in a mixture of 13% or less by volume with air or having an explosive (flammable) range of at least 12% when mixed with air regardless of the lower explosion (flammable) limit

**Category 2 (Warning: Flammable gas)**

Gases, other than those in Category 1, which are gaseous at 20°C and a standard pressure of 101.3 kPa and have an explosive (flammable) range when mixed with air



**We need gas detectors because flammable gas leaks can lead to explosions.**

# Need for gas detectors (definition of permissible concentration)

## ● Definition of permissible concentration

Even when workers are exposed to hazardous substances at work sites, no adverse health effects should emerge as long as the airborne concentration of the **hazardous** substance remains below the permissible concentration.

Recommended permissible concentrations have been set by the American Conference of Governmental Industrial Hygienists (ACGIH) and the Japan Society for Occupational Health. We use the **ACGIH** permissible concentrations.

## ● Types of permissible concentrations

### • TWA (Time Weighted Average)

Time Weighted Average refers to time-weighted average concentrations over an 8-hour workday and 40-hour workweek of routine work to which workers may be repeatedly exposed without adverse health effects.

### • STEL (Short Term Exposure Limit)

Short Term Exposure Limit refers to exposure that does not lead to adverse health effects if each exposure does not exceed 15 minutes, the number of daily exposures does not exceed four, and the exposures are separated by at least one hour.

### • C (Ceiling value)

Ceiling Value refers to the upper limit that can never be exceeded.



**We need gas detectors because leaks exceeding permissible concentrations can lead to accidents.**



# How human body reacts to oxygen-deficiency

O2 Concentration  
21%



Symptoms  
Natural air

O2 Concentration  
18%



Symptoms  
Limit level for not causing serious health problems. Continuous ventilation is required



O2 Concentration  
16% - 12%

Symptoms  
Rapid breathing,  
Increase in pulse rate,  
Loss of concentration,  
Headache, Nausea,  
Ear ringing



O2 Concentration  
14% - 9%



Symptoms  
Stupor, Headache,  
Nausea, Cyanosis,  
Faintness on the entire  
body

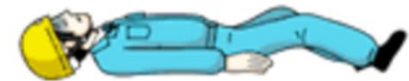
O2 Concentration  
10% - 6%

Symptoms  
Comatose, Loss of consciousness,  
Muscle spasm on the entire body



O2 Concentration  
6% or less

Symptoms  
Unconsciousness, Comatose,  
Cessation of breathing,  
Cardiac arrest, Die in 6 minutes



# Effects of hydrogen sulfide (H<sub>2</sub>S) on human body

Concentration (ppm)	Effects and Toxicity
0.025	Smell vaguely. (It varies according to the individual.)
0.3	Smell clearly.
3 - 5	Smell moderate degree of objectionable odor.
10	Lower-level to irritate eyes' mucus membranes.
20 - 40	A strong odor. Lower-level to irritate lungs' mucous membranes.
100	Sense of smell is impaired in 2 - 15 minutes. Eyes and respiratory tract are irritated in 1 hour. 8 - 48 hours continuous exposure can lead to death.
170 - 300	1 hour exposure is the limit for not causing serious health problems.
400 - 700	Life-threatening exposure in 0.5 - 1 hour.
800 - 900	Bring on loss of consciousness, cessation of breathing and death.
1000	Bring on immediate loss of consciousness and death.

# Effects of carbon monoxide (CO) on human body

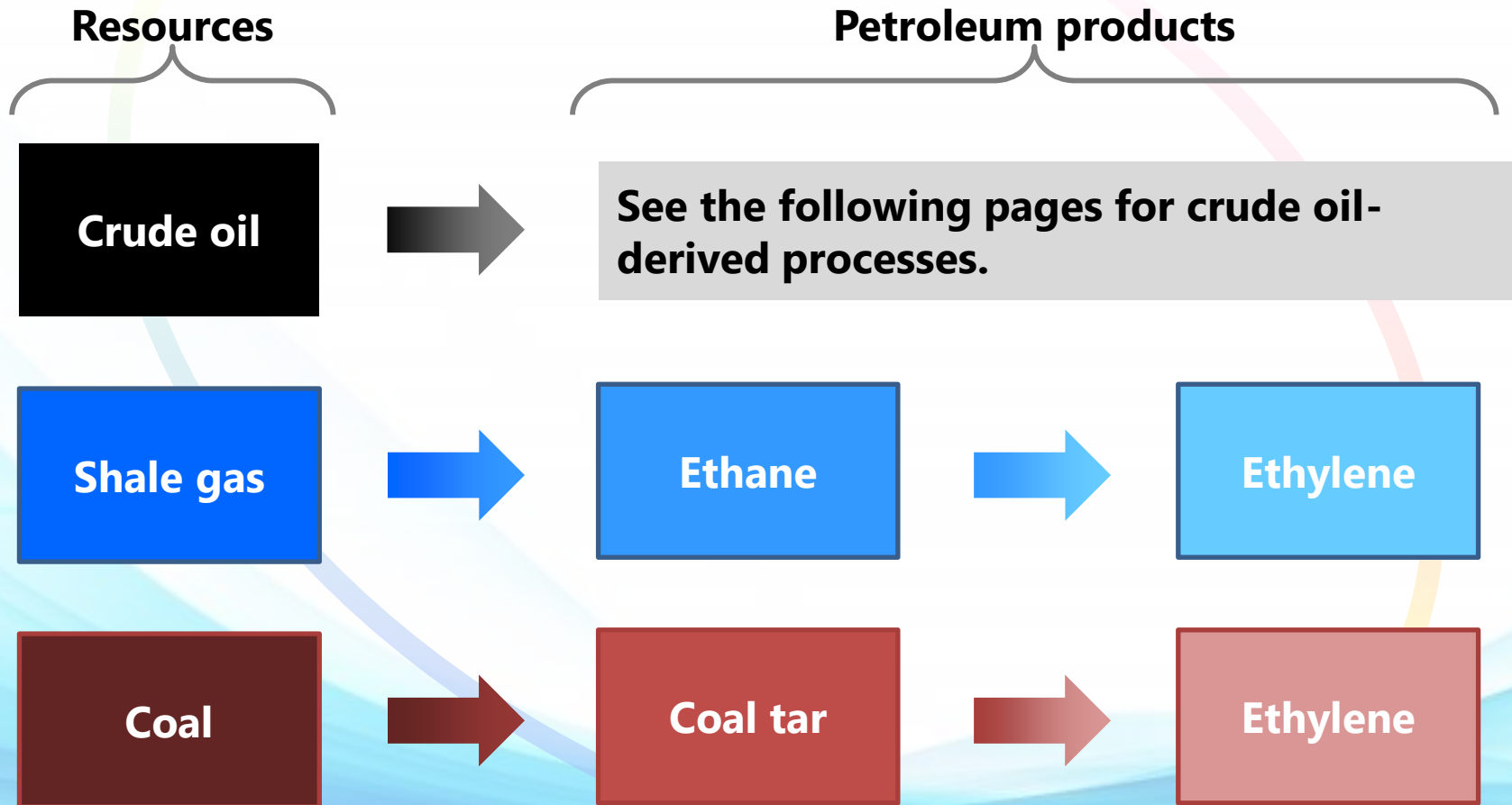
Concentration (ppm)	Effects and Toxicity
100	No noticeable effects even after breathing for a few hours.
200	A mild headache in around 1.5 hours.
400 - 500	Headache, nausea and ear ringing in around 1 hour.
600 - 1000	Loss of consciousness in around 1 - 1.5 hours.
1500 - 2000	Headache, vertigo and disabling nausea in around 0.5 - 1 hour, and losing consciousness.
3000 - 6000	Headache, vertigo, disabling nausea...etc. in a few minutes. 10 - 30 minutes exposure can lead to death.
10000	Bring on immediate loss of consciousness and death.

# **Applications in Oil and Fossil Fuel Market**



# Applications in oil and fossil fuel market (Overview of processes)

An overview of the oil and fossil fuel market is given below. The oil and fossil fuel market involves the manufacture of various petroleum products from natural resources such as crude oil, shale gas, and coal.



## 1. Crude oil-derived processes

1-1: Crude oil tank

1-2: Topping plant (Topper)

1-3: Vacuum distillation plant (Vacuum)

1-4: Catalytic cracker (FCC)

1-5: Bottom hydrogenation refining plant (H-Oil)

1-6: Delayed coker (Coker)

1-7: Naphtha desulfurization plant

1-8: Ethylene manufacturing plant

1-9: Aromatic extraction plant

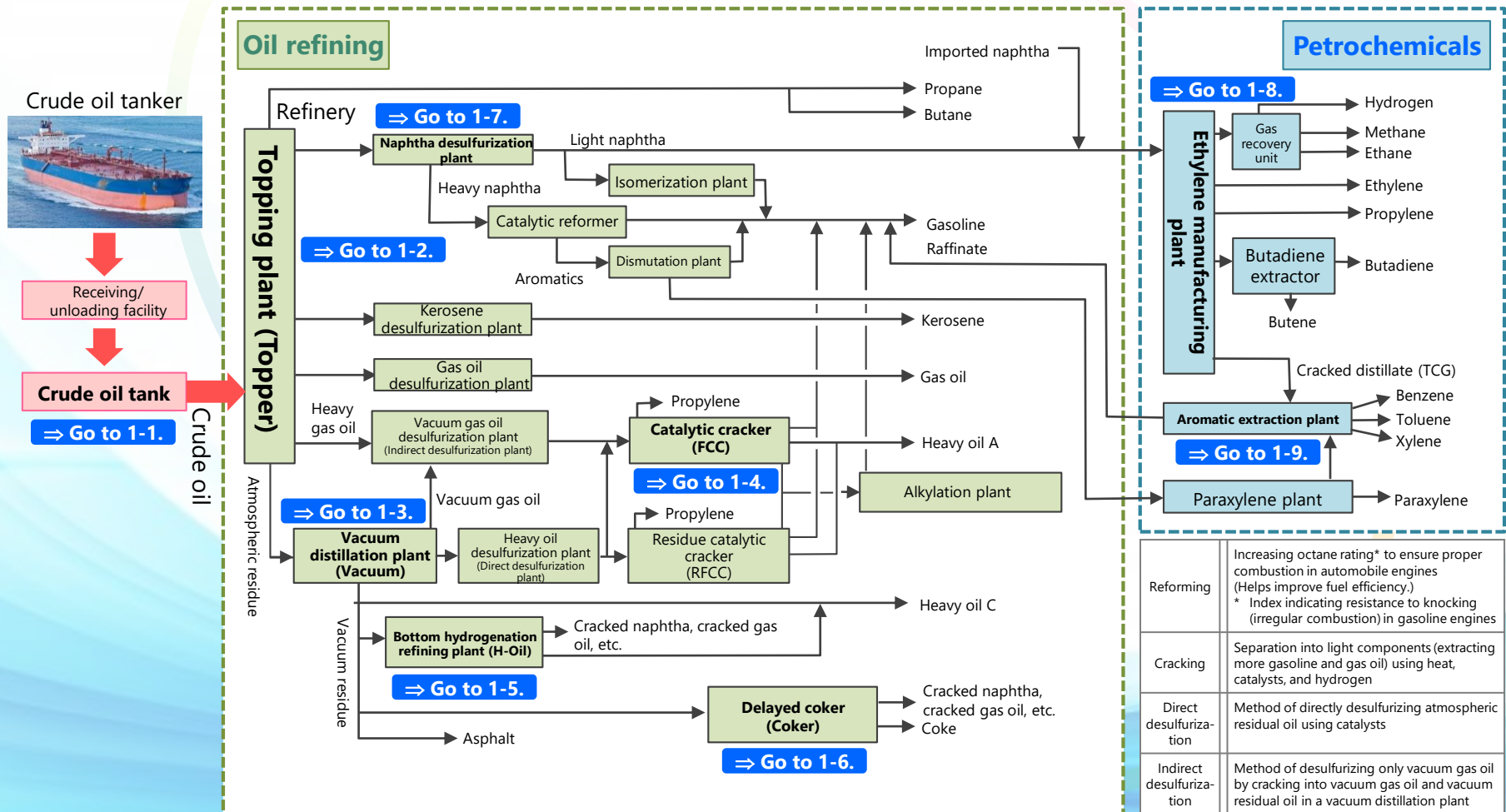
## 2. Shale gas-derived processes

## 3. Coal-derived processes

## 4. Overall plant safety management

# 1. Crude oil-derived processes

The typical manufacturing processes used to derive products from crude oil are shown below. Gas detectors and alarms are used in each of these processes. The subsequent pages discuss specific risks associated with leaking combustible and toxic gases produced in each process, alongside examples of the installation of various gas detectors and alarms.

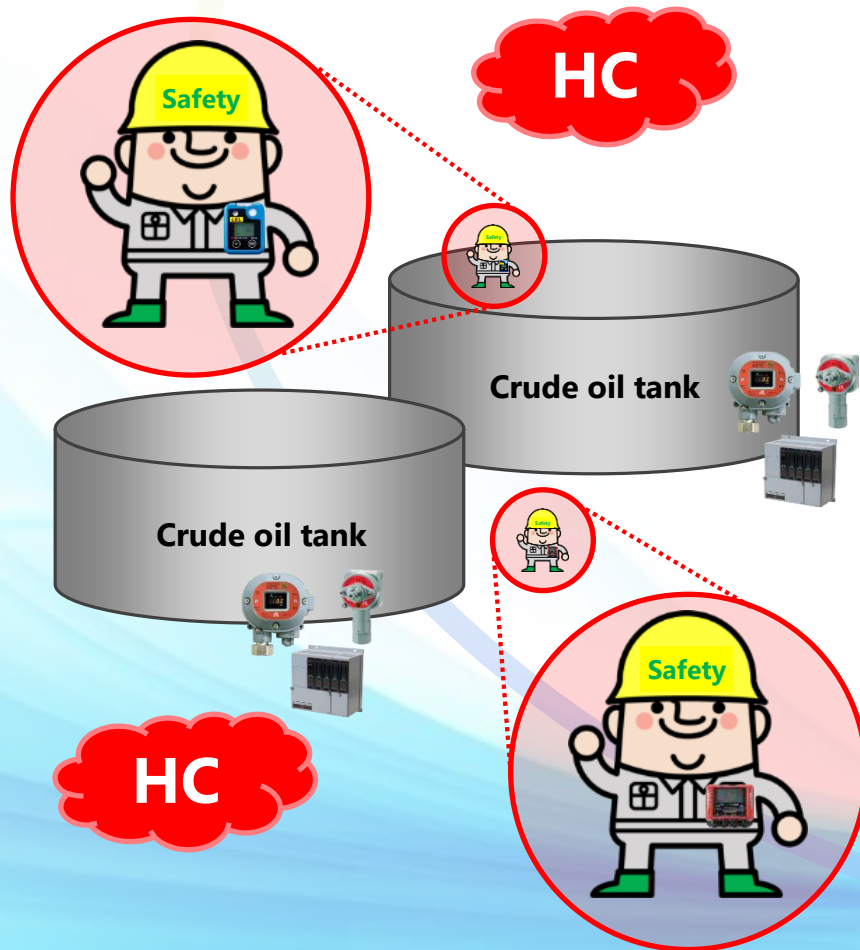


# 1-1: Crude oil tank

**Description:** Crude oil transported is stored in the crude oil tank.

**Hazardous risks:** Leaks from the crude oil tank pose explosion risk.

⇒ **Detecting combustible gas (HC) to prevent explosions**



**Combustible gas (HD) detector heads**



**Combustible gas monitor**



**Personal gas detectors for workers**



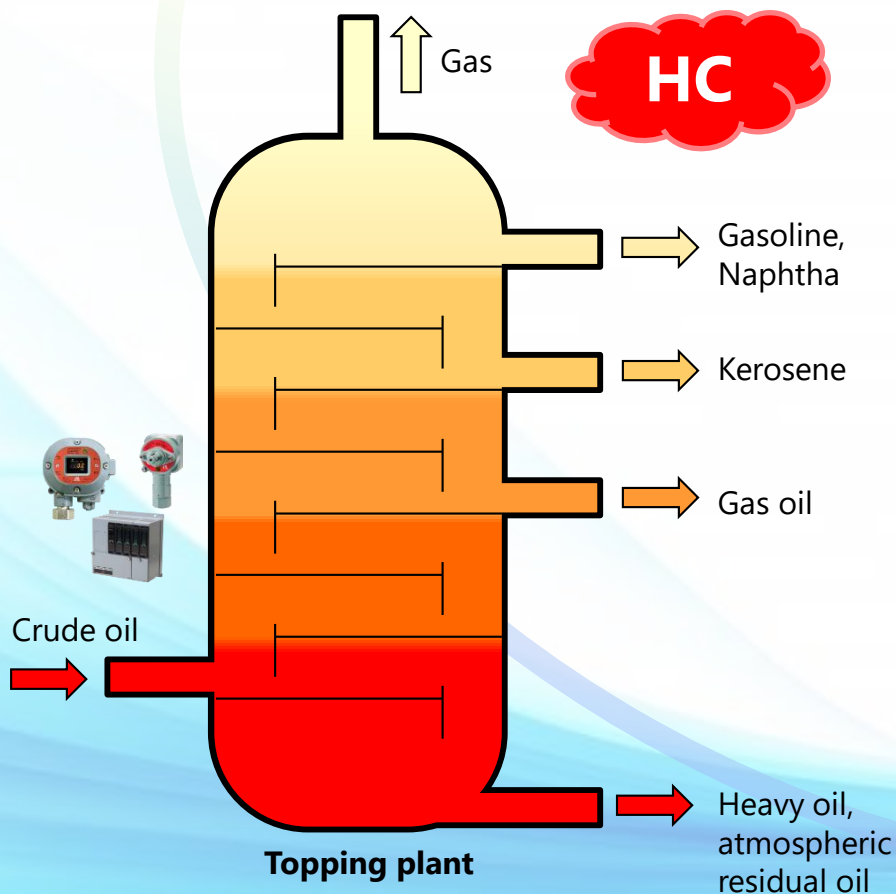


# 1-2: Topping plant (Topper)

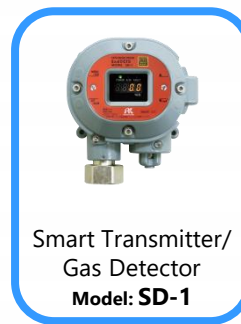
**Description:** The topping plant leverages the different boiling points of crude oil to separate components into semifinished products such as gasoline, naphtha, kerosene, gas oil, and heavy oil.

**Hazardous risks:** Leaks from the topping plant pose explosion risk.

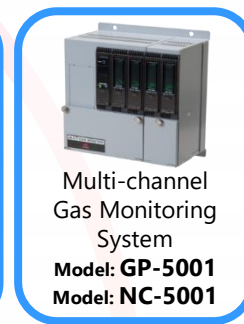
⇒ Detecting combustible gas (HC) to prevent explosions



Combustible gas (HD) detector heads



Combustible gas monitor



Personal gas detectors for workers

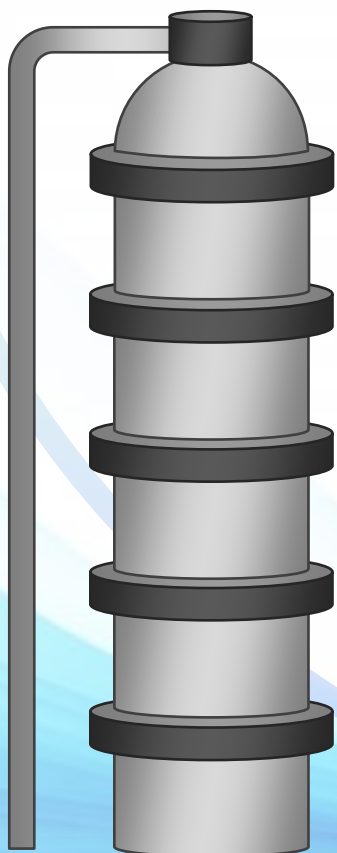


# 1-3: Vacuum distillation plant (Vacuum)

**Description:** The vacuum distillation plant distills atmospheric residual oil from the topping plant under reduced pressure to separate it into vacuum residue, heavy oil, gas oil, and other components.

**Hazardous risks:** Leaks from the vacuum distillation plant pose explosion risk.

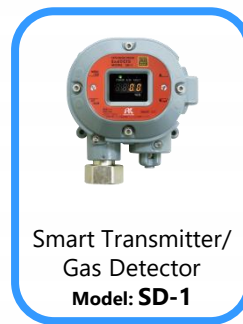
⇒ Detecting combustible gas (HC) to prevent explosions



Vacuum distillation plant



Combustible gas (HD) detector heads



Combustible gas monitor



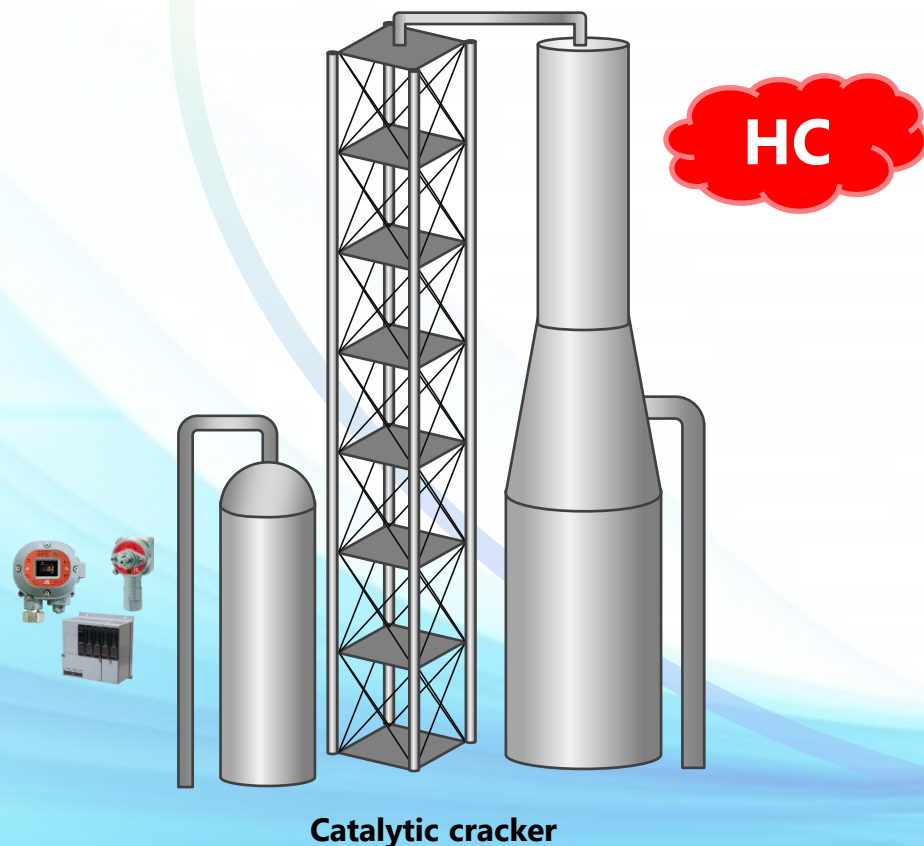
Personal gas detectors for workers



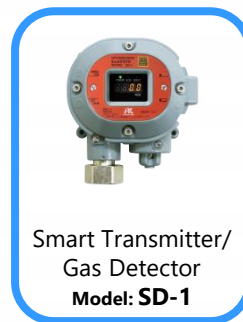
# 1-4: Catalytic cracker (FCC)

**Description:** The catalytic cracker (FCC) cracks residual heavy oil into light residual components using a high-temperature catalyst. This plant increases gasoline extraction rates at oil refineries.

**Hazardous risks:** Leaks from the catalytic cracker pose explosion risk. ⇒ Detecting combustible gas (HC) to prevent explosions



Combustible gas (HD) detector heads



Combustible gas monitor



Personal gas detectors for workers

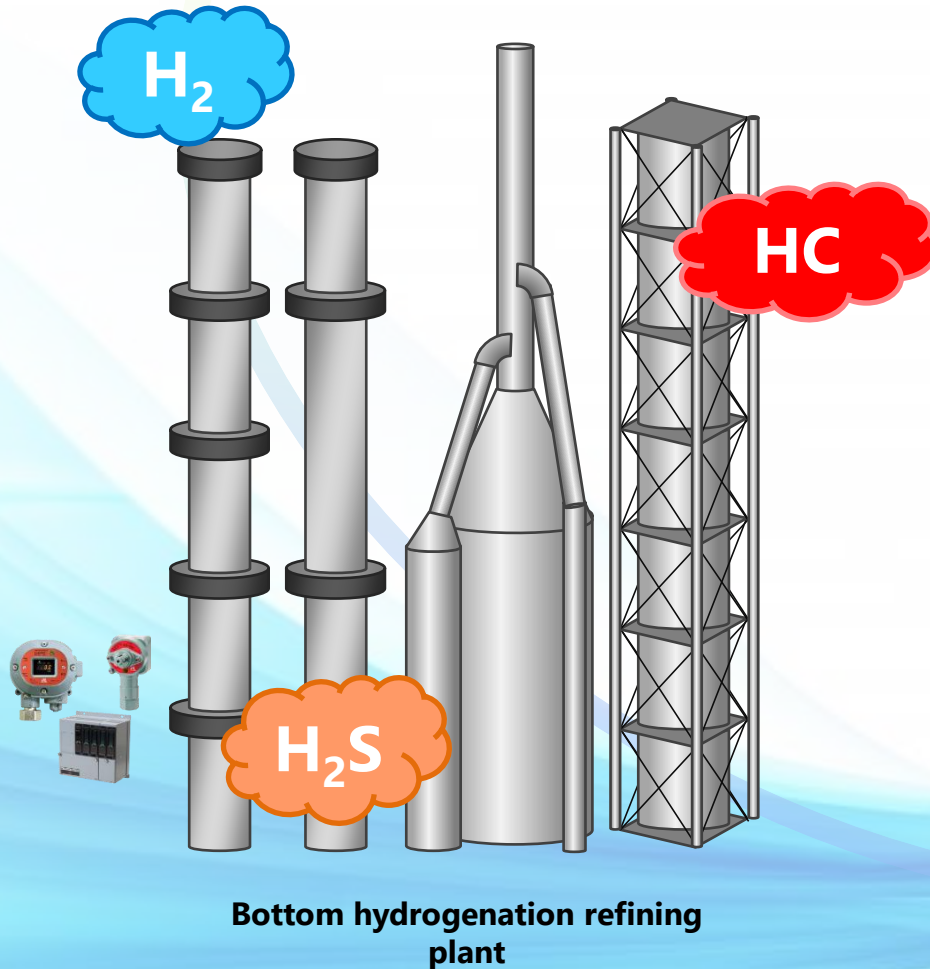


# 1-5: Bottom hydrogenation refining plant (H-Oil)

**Description:** The bottom hydrogenation refining plant (H-Oil) produces cracked naphtha and cracked gas oil by removing sulfur within the residual oil by hydrogenation reaction with a catalyst.

**Hazardous risks:** Leaks from the bottom hydrogenation refining plant pose explosion risk and poisoning risk.

⇒ **Detecting combustible gas (HC, H<sub>2</sub>) to prevent explosions**  
**Detecting H<sub>2</sub>S to prevent poisoning**



Combustible gas (HC, H<sub>2</sub>)  
detector heads



H<sub>2</sub>S detector head



Combustible gas  
monitor



Personal gas detectors for  
workers



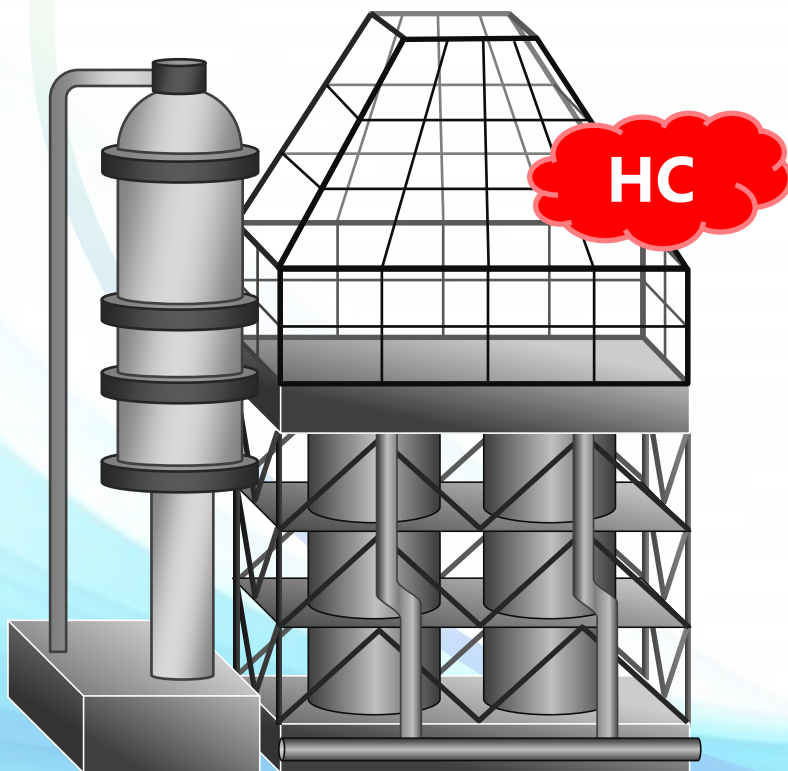


# 1-6: Delayed coker (Coker)

**Description:** The delayed coker (coker) produces gasoline and gas oil by thermal cracking of the vacuum residual oil at high temperature, which otherwise only becomes heavy oil C base material or asphalt.

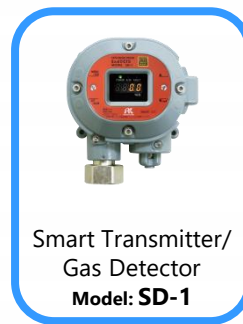
**Hazardous risks:** Leaks from the delayed coker pose explosion risk.

⇒ Detecting combustible gas (HC) to prevent explosions



Delayed coker

## Combustible gas (HD) detector heads



## Combustible gas monitor



## Personal gas detectors for workers

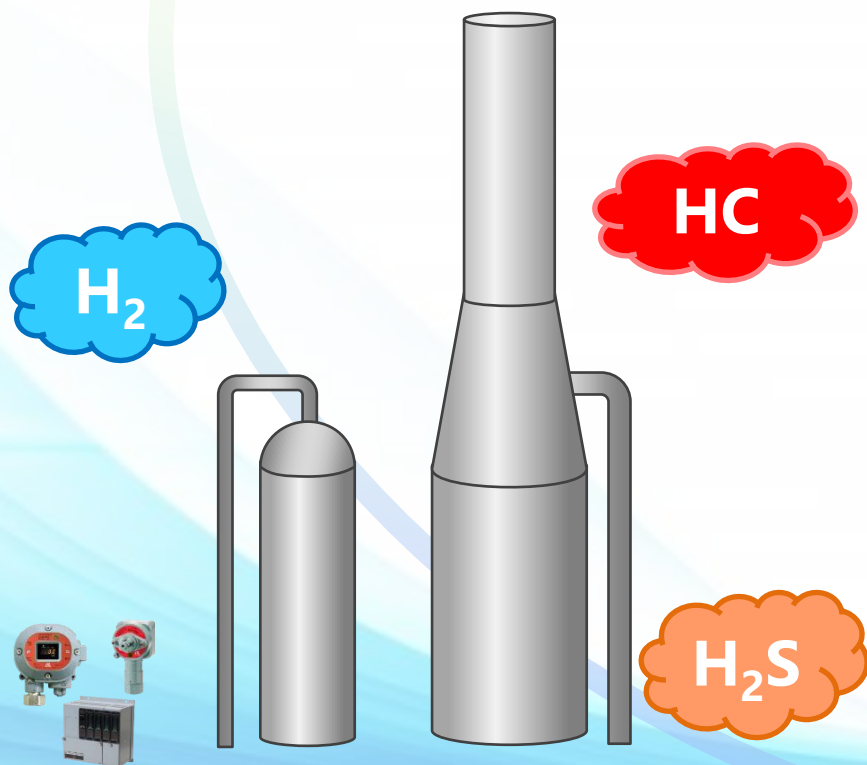


# 1-7: Naphtha desulfurization plant

**Description:** The naphtha desulfurization plant removes sulfur and other impurities from the naphtha fraction to produce raw materials for use in ethylene plants and catalyst reformers.

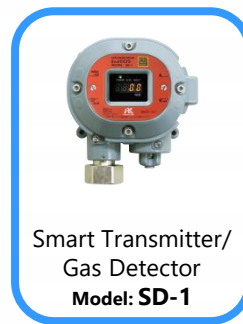
**Hazardous risks:** Leaks from the naphtha desulfurization plant pose explosion risk and poisoning risk.

⇒ **Detecting combustible gas (HC, H<sub>2</sub>) to prevent explosions**  
**Detecting H<sub>2</sub>S to prevent poisoning**



Naphtha desulfurization plant

Combustible gas (HC, H<sub>2</sub>) detector heads



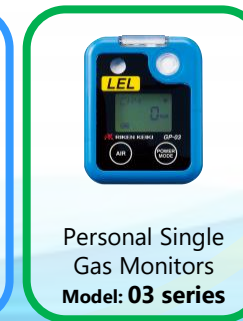
H<sub>2</sub>S detector head



Combustible gas monitor



Personal gas detectors for workers

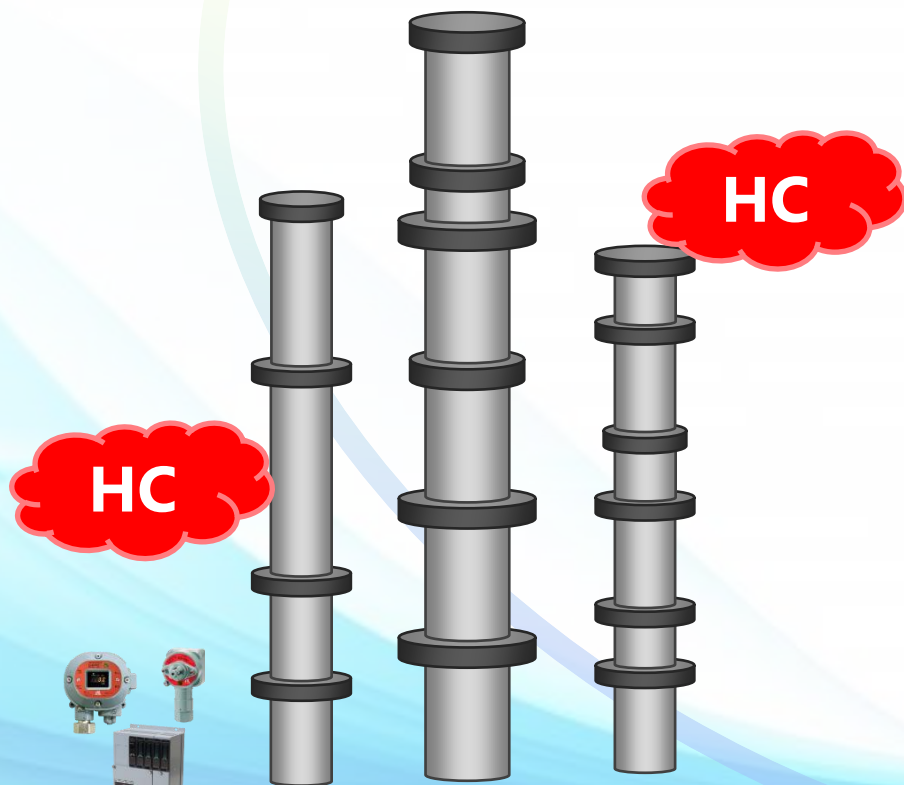


# 1-8: Ethylene manufacturing plant

**Description:** The ethylene manufacturing plant thermally cracks naphtha into hydrocarbons of lower molecular weight containing olefins such as ethylene and propylene and separates them into their respective components.

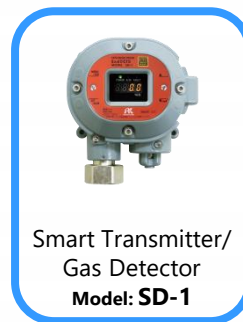
**Hazardous risks:** Leaks from the ethylene manufacturing plant pose explosion risk.

⇒ Detecting combustible gas (HC) to prevent explosions



Ethylene manufacturing plant

Combustible gas (HD) detector heads



Combustible gas monitor



Personal gas detectors for workers

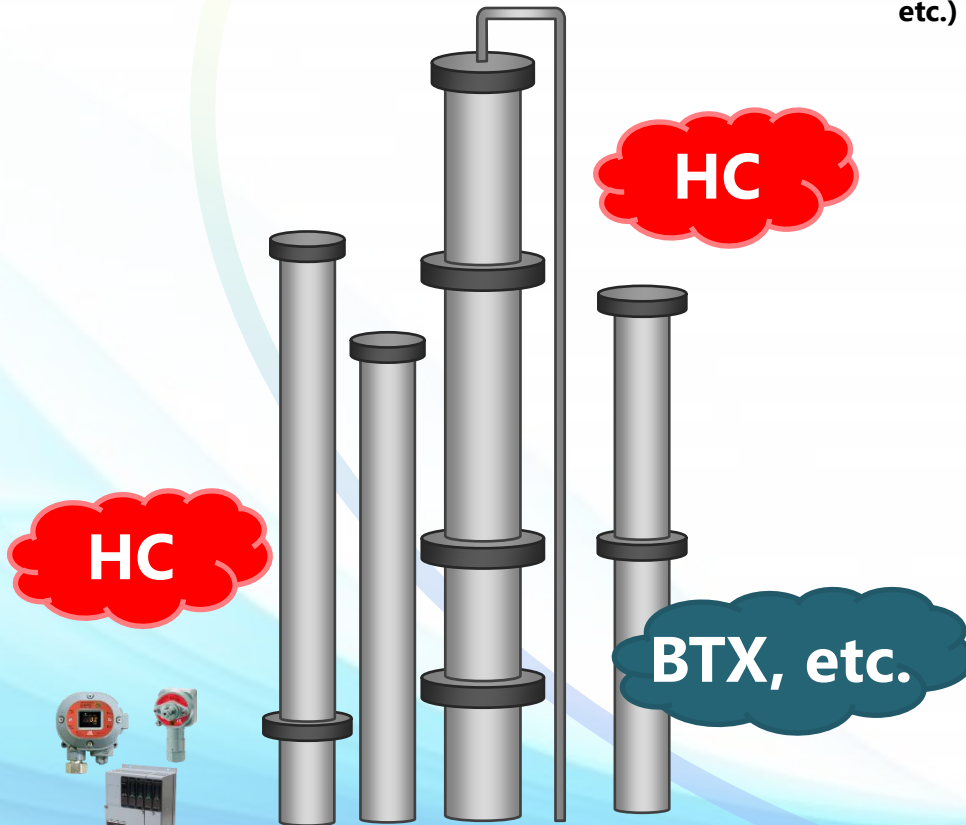


# 1-9: Aromatic extraction plant

**Description:** The aromatic extraction plant extracts benzene, toluene, and xylene from thermal cracking residual oil (oil produced as by-product in ethylene manufacture) and reformed gasoline.

**Hazardous risks:** Leaks from the aromatic extraction plant pose poisoning and explosion risks.

⇒ **Detecting combustible gas (HC) to prevent explosions**  
**Preventing poisoning due to VOC (BTX, etc.)**



Aromatic extraction plant

## Combustible gas (HD) detector heads



## Combustible gas monitor



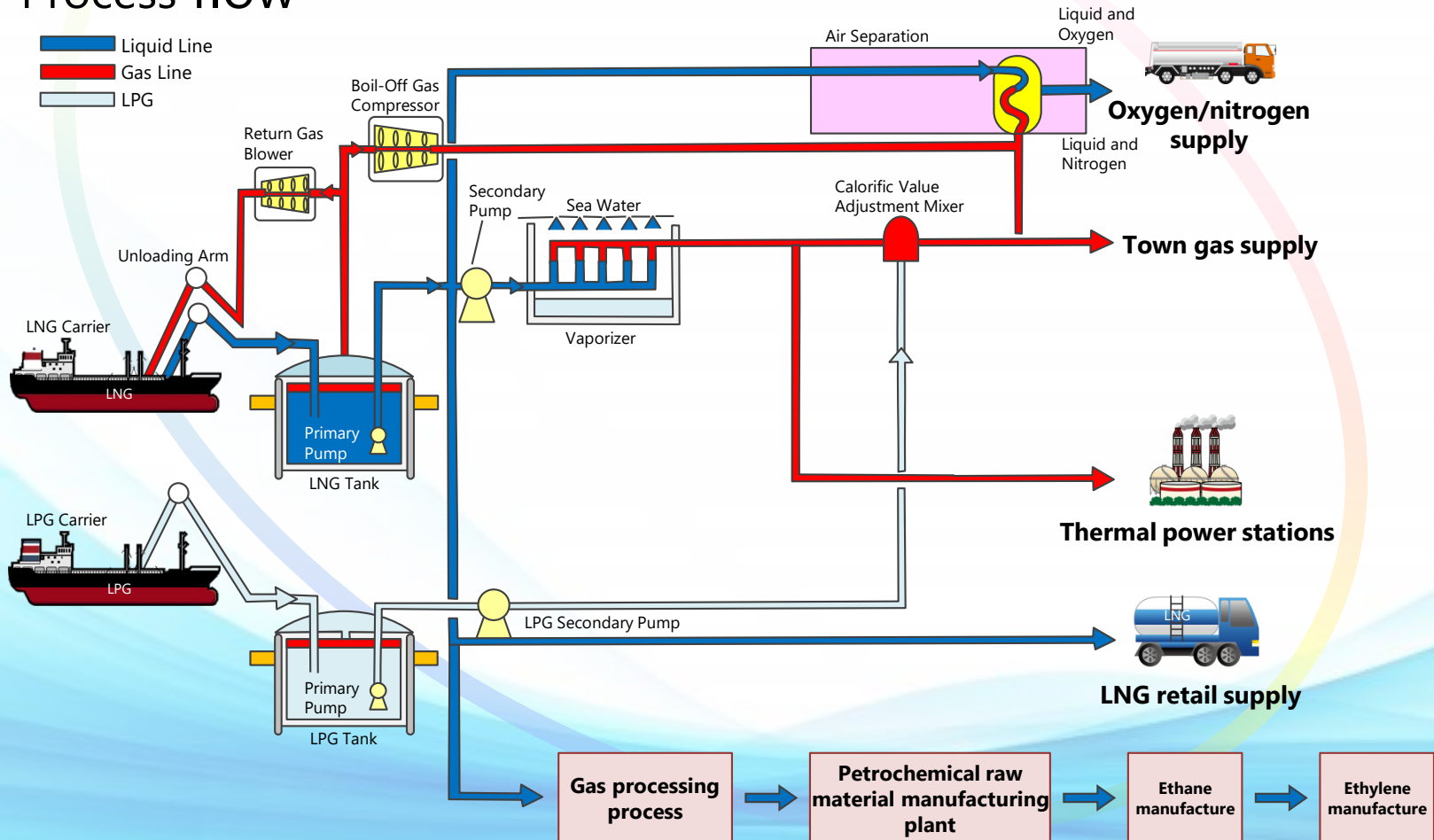
## Personal gas detectors for workers



## 2. Shale gas-derived processes

The typical manufacturing processes used to derive products from shale gas are shown below. Gas detectors and alarms are used in each of the processes.

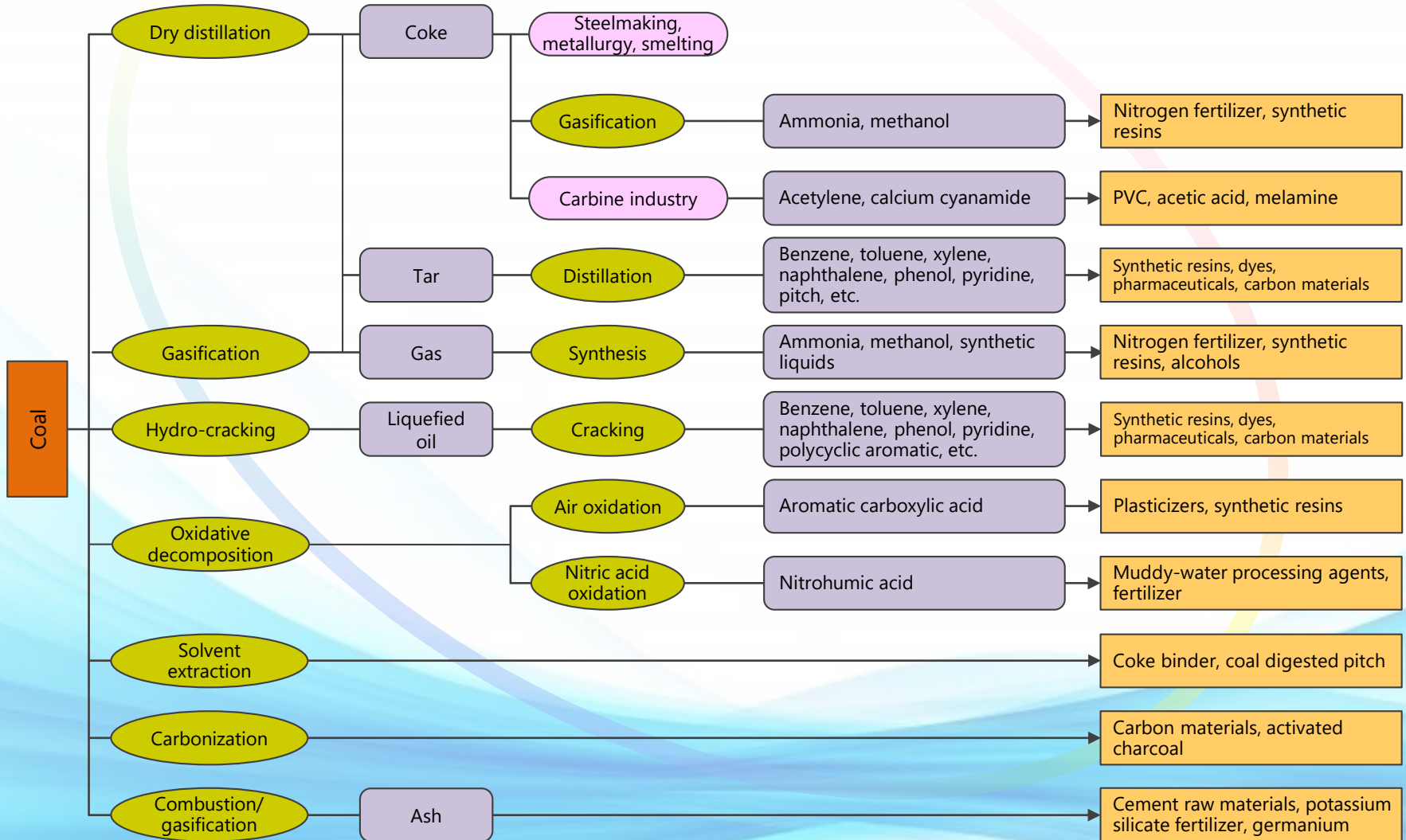
### Process flow





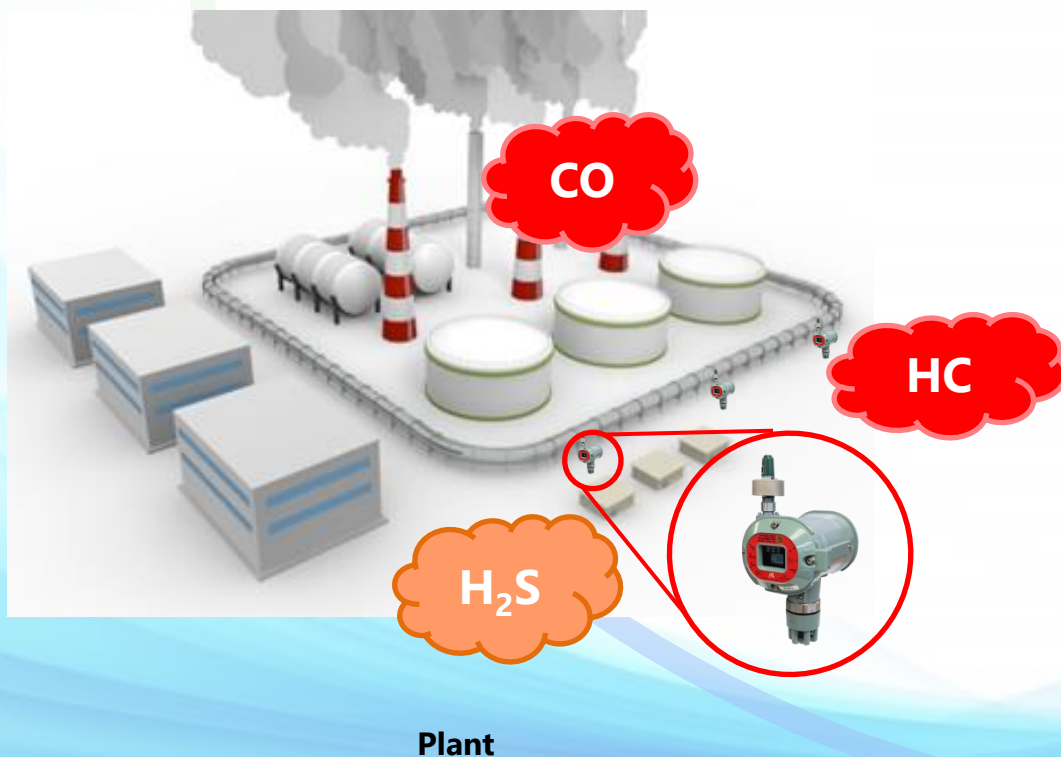
# 3. Coal-derived processes

The typical manufacturing processes used to derive products from coal are shown below. Gas detectors and alarms are used in each process.



## 4. Overall plant safety management

- A wide range of boundary monitors are used to manage overall plant safety.
- In addition to serving as boundary monitors, wireless gas detectors can also be used for monitoring wide areas and as temporary gas detectors.



Gas detector heads that  
can be used as boundary  
monitors





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# Major Examples of Accidents

Prepared by extracting and processing materials from the Safety at Work Site  
(Ministry of Health, Labour and Welfare: <http://anzeninfo.mhlw.go.jp/index.html>)

# Case of fatal carbon monoxide poisoning during recovery of cleaning wastewater from an LCG impurity removal plant

## [Location of accident]

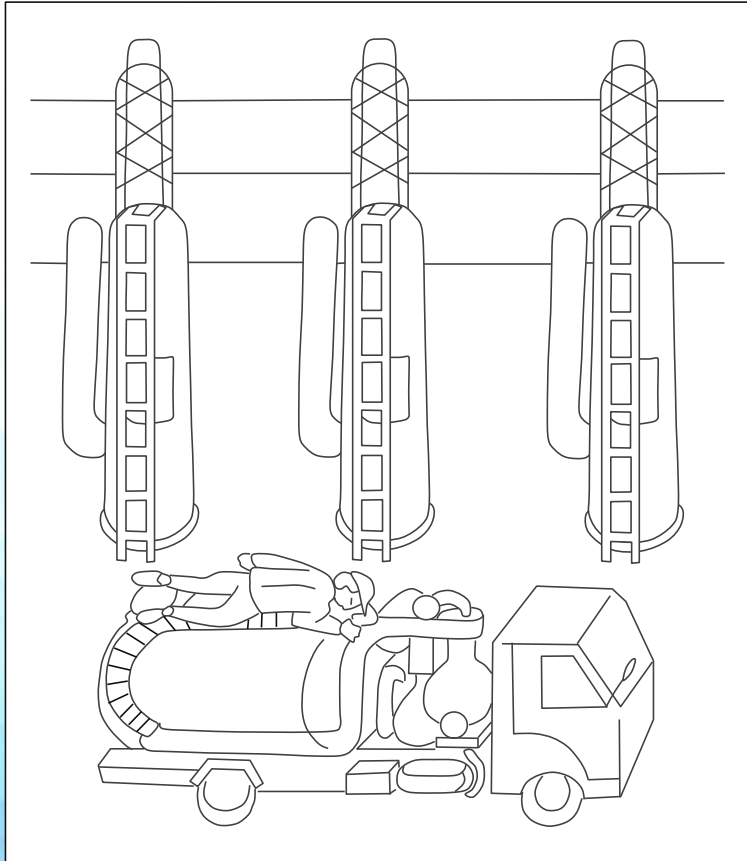
The accident occurred at an impurity removal plant for LCG (low-calorie gas containing 24.5% carbon monoxide) produced as a by-product in oil refining.

## [Cause of accident]

The top demister (metal mesh impurity remover) removes LCG impurities and needs to be cleaned when it clogs. This is typically once or twice a month. The wastewater here is transferred to the water tank until the water tank is 70% full, then discharged until the level falls to 10%. This keeps LCG from flowing from the water outlet. In this case, all water was drained from the water tank and LCG flowed through the connected pipe into the wastewater collection dump truck.

## [Damage/injuries]

A worker near the inspection hatch on the top of the dump truck died after inhaling LCG.



Wearing gas detectors on a routine basis enables early detection of toxic gas leaks and improves work safety.

# Case of naphtha leakage and fire at an oil refinery plant

## [Location of accident]


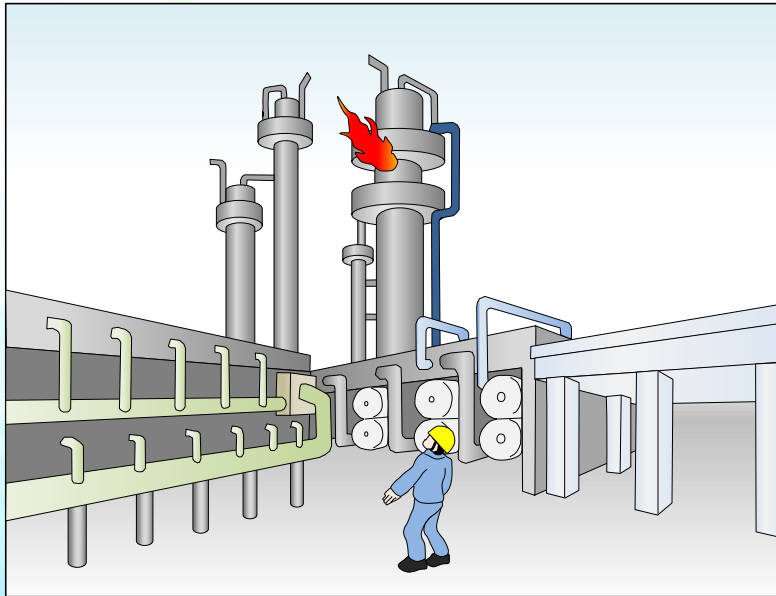
The accident occurred in a desulfurization stripping tower at a heavy gas oil hydrogenation desulfurizing plant located inside an oil refinery plant (tower used to separate naphtha from oil at low pressure to extract desulfurized oil; operates at 228°C and 0.38 Mp).

## [Cause of accident]

Hydrocarbons, primarily naphtha, leaked from a hole near the top of a desulfurization stripping tower. (This hole had formed from the interior due to corrosion at a location previously repaired by build-up welding.) A worker observed flames emanating from a gap in the window of the heat protection plate, close to the top of the tower.

## [Damage/injuries]

The control center was immediately notified and the plant shut down because of the emergency. The fire was subsequently put out.



Wearing gas detectors on a routine basis enables early detection of combustible gas leaks and improves work safety.



# Case of explosion while loading gas oil onto a tank truck



## **[Location of accident]**

The accident occurred at a tank truck allocated to oil tank (with a load capacity of up to 20 kl of gasoline, kerosene, gas oil, or heavy oil).

## **[Cause of accident]**

Gas oil was being loaded into the tank truck through the oil refinery loading hose without securing the electrical conduction of the hose and the tank of the truck. The gas oil inside the hose generated static electricity due to streaming electrification, and a spark occurred. Since the tank had not been flushed to remove kerosene vapor remaining from when the tank was last used to load kerosene, the spark ignited the kerosene vapor filling the tank, causing an explosion. The flames spread over the entire tank truck and to the work clothes of a worker standing on top of the truck. The fire on the work clothes was extinguished with tap water.

## **[Damage/injuries]**

The victim was immediately taken to hospital and subsequently missed work for nine months for treatment for burn injuries.



Wearing gas detectors on a routine basis enables early detection of combustible gas leaks and improves work safety.

# Case of hydrogen sulfide poisoning during pipe work

## [Location of accident]


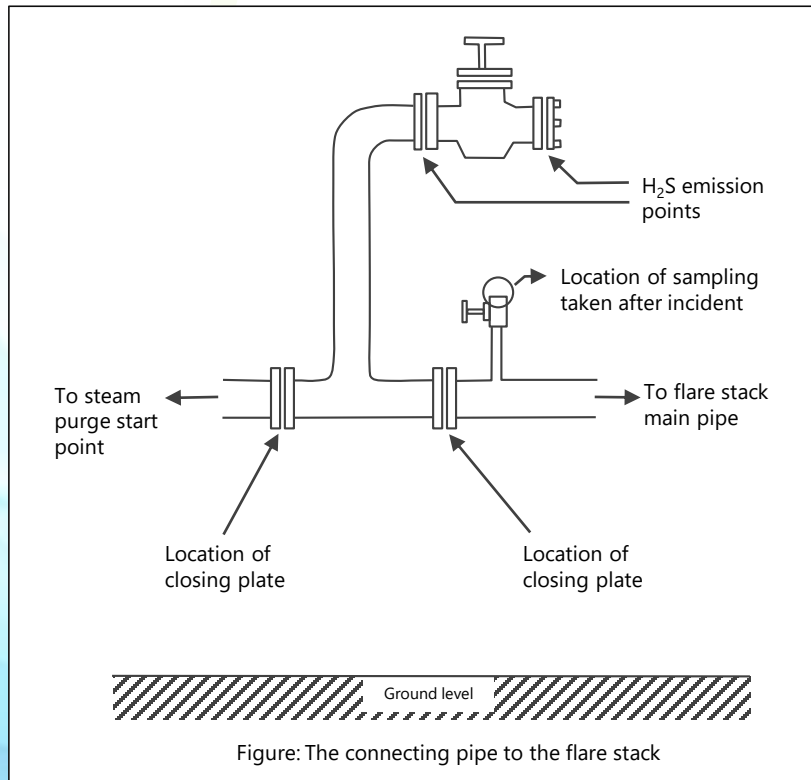
The accident occurred in a connecting pipe (large-diameter pipe and branches connected to various facilities within the site) mounted on a flare stack (facility for burning off waste combustible gas produced during oil refining) at an oil refinery.

## [Cause of accident]

A worker was replacing a valve and its mounting flange. The flange had been installed improperly during the earlier installation of a connecting pipe to supply LPG from the LPG tank as supporting gas for the flare stack. The worker failed to close the connecting valve on the large-diameter pipe side while removing the closing plate on the connecting pipe during valve installation, resulting in the release of combustible gas containing hydrogen sulfide from the flange and valve. Another worker located downwind collapsed after inhaling the gas.

## [Damage/injuries]

The victim was moved by other workers to a location seven to eight meters away and eventually regained consciousness. The victim complained of a headache; in response, oxygen was administered, and the worker was transported to the hospital by ambulance.



Wearing gas detectors on a routine basis enables early detection of toxic gas leaks and improves work safety.

# Product Information



RIKEN KEIKI



**GP-03**

(For combustible gases)

**OX-03**

(For oxygen)

**HS-03**

(For hydrogen sulfide)

**CO-03**

(For carbon monoxide)

Personal  
Single Gas Monitors

**Model:**

**03 series**

## Features

- Models powered by rechargeable batteries have been added to the product line.
- Standard protective cover protects the main unit from scratches, dirt, and impact.
- Compact, lightweight design doesn't interfere with work.
- Inherently safe and explosion-proof enclosure is ideal for use in hazardous locations.



Four Gas Personal Monitor

# Model: GX-2009

## Features

- Explosion-proof product that can be used in hydrogen/acetylene atmospheres
- Protection rating equivalent to IP 67 ensures safe use for outdoor work.
- Three-direction alarm lamps and two-direction alarm buzzers to alert both the carrier and those in surrounding areas
- Buzzer volume of 95 dB or more can be clearly heard even in noisy factory environments.
- Simultaneous display of gas concentrations of up to four components on large LCD screen
- Also equipped with clock display and data logger functions

## Type list

Components	Type	Gas types
4-component	TYPE A/H/T	O <sub>2</sub> , LEL, H <sub>2</sub> S, CO
3-component	TYPE B/H/T	O <sub>2</sub> , LEL, H <sub>2</sub> S
	TYPE C/T	O <sub>2</sub> , LEL, CO
2-component	TYPE D/T	O <sub>2</sub> , LEL
	TYPE E/H/T	O <sub>2</sub> , H <sub>2</sub> S
	TYPE F/T	O <sub>2</sub> , CO
	TYPE I/T	LEL, CO
	TYPE J	H <sub>2</sub> S, SO <sub>2</sub>





RIKEN KEIKI

Portable  
Multi Gas Detector

**Model:**  
**GX-6000**



## Features

- A single unit can simultaneously display up to six types of gases, including VOCs. This product is the first of its kind from a Japanese manufacturer.
- The PID sensor enables measurements of more than 200 types of target chemical substances.
- Ideal for checking the risks and hazards of chemical substances as required under the Industrial Safety and Health Act
- Support for multilingual display (Japanese, English, French, Spanish, etc.)
- Equipped with convenient new functions, including panic alarm and LED flashlight



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**SD-1**

**SD-1RI**

(For combustible  
gases)

**SD-1GH**

(For combustible/  
toxic gases)

**SD-1EC**

(For carbon monoxide/  
hydrogen sulfide)

**SD-10X**

(For oxygen)

Smart Transmitter/  
Gas Detectors

**Model:**

**SD-1** series

## Features

- Explosion-proof products that can be used in hydrogen/acetylene atmospheres
- Waterproof/dustproof enclosure (IP 65 equivalent) allows deployment in severe environments.
- Supports HART Communication Protocol, allowing transmission of more information over legacy analog 4-20 mA connections.
- \* Excluding SD-1 (TYPE NC)
- SD-1RI, SD-1EC, and SD-10X are SIL 2 certified in all parts of the functional safety standard, marking a first for Japanese manufacturers.
- Using the suction cap for the SD-1 series and connecting the detector to a suction pump or an aspirator unit enables suction type operation.



RIKEN KEIKI



### SDWL-1RI

(For combustible gases)



### SDWL-1EC

(For carbon monoxide/  
hydrogen sulfide)



### SDWL-10X

(For oxygen)

Fixed Wireless  
Gas Detectors

# Model:

# SDWL-1 series

## Features

- Wireless transmission function makes these products ideal for improving safety management in locations where wiring presents problems.
  - Conforms to ISA 100.11a standard specification, enabling connection to other manufacturers' instruments.
  - Battery pack completely eliminates wiring. Fully standalone
  - Mounting configuration allows easy installation anywhere. (with dedicated mounting bracket)
  - Pressure resistant and inherently safe explosion-proof construction
- \* TIIS explosion-proof certification pending



RIKEN KEIKI



## GD-A80

(For combustible gases)



## GD-A80V

## GD-A80S\*

(For combustible or toxic gases)

\* The GD-A80S nameplate is blue.

Combustible/Toxic  
Gas Detector Heads

# Model:

# GD-A80 series

## Features

- Explosion-proof rating Exd II CT4 allows use in hydrogen and acetylene atmospheres.
- Suction type and aspirator suction type operations are supported.  
(\* A pump unit and a power supply [available separately] are required.)
- The GD-A80-70 is also provided as a combustible gas detector head for use in high-temperature environments up to 70°C (normally 53°C).





RIKEN KEIKI



**Multi-case**



**Single case**

## Features

- System options include a wide range of gas detector heads.
- Gas concentrations are displayed in two ways: bar meter and digital display.
- High-contrast three-color LCD improves visibility of detected state.
- Equipped with RS-485 communication function (optional)

Multi-channel Gas Monitoring Systems

# Model:

# RM-5000 series



# **International Agents**

## **International Agents**



**North America**

**South America**

**Asia and Pacific**

**Russia and Central Asia**

**Europe**

**Middle East**

**Africa**

## International agents (table of contents)

North America

U.S.A.

South America

Brazil

Argentina

Peru

Chile

Uruguay

Asia and Pacific

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South Korea

Taiwan

Singapore

Malaysia

Indonesia

Thailand

India

Vietnam

Philippines

Australia

Europe

Germany

Greece

THE NETHERLANDS

Norway

Turkey

U.K.

Middle East

U.A.E.

Israel

Africa

South Africa

Russia and Central Asia

Russia

## International agents (U.S.A.)

# RKI INSTRUMENTS, INC.

ADDRESS : 33248 CENTRAL AVENUE, UNION CITY, CA94587-2010 U.S.A.

TEL : +1-510-441-5656

FAX : +1-510-441-5650

E-MAIL : [bob@rkiinstruments.com](mailto:bob@rkiinstruments.com), [sandra@rkiinstruments.com](mailto:sandra@rkiinstruments.com)

PERSON : MR. BOB PELLISSIER (PRESIDENT)  
MRS. SANDRA GALLAGHER (VICE PRESIDENT)

WEBSITE : <http://www.rkiinstruments.com/>

## International agents (BRAZIL)

### HIDEO NAKAYAMA IMP. EXP. COM. E INDUSTRIA LTDA

ADDRESS : RUA SANTA AMÉLIA, 33 PRACA DA BANDEIRA  
RIO DE JANEIRO RJ CEP: 20.260-030 BRAZIL

TEL : +55-21-2590-3496

FAX : +55-21-2270-6390

E-MAIL : [hideko@nakayama.com.br](mailto:hideko@nakayama.com.br)

PERSON : MR. HIDEO NAKAYAMA (PRESIDENT)  
MS. HIDEKO NAKAYAMA

WEBSITE : <http://www.nakayama.com.br/>





## **International agents (ARGENTINA)**

### **Prevent Gas SA**

ADDRESS : INCLAN 4185 (C1258ABK) CIUDAD DE BUENOS AIRES, ARGENTINA  
TEL : +54-11-4925-6342  
FAX : +54-11-4925-6342  
E-MAIL : [ventas@preventgas.com.ar](mailto:ventas@preventgas.com.ar)  
PERSON : Mr. German Rosas  
WEBSITE : <http://preventgas.com.ar/>

### **HUBERG SUDAMÉRICA S.A.**

ADDRESS : ERASMO (CALLE 79) 1047 (B1650HOE) VILLA PIAGGIO  
SAN MARTÍN, BUENOS AIRES, ARGENTINA  
TEL : +54-11-4713-6068  
FAX : +54-11-4713-6072  
E-MAIL : [arguello.juan@huberg.com](mailto:arguello.juan@huberg.com)  
PERSON : MR. JUAN IGNACIO ARGUELLO  
WEBSITE : <http://www.huberg.com.ar>



## International agents (PERU)

### RESET ELECTRONICA Y SISTEMAS S.R.L.

ADDRESS : Calle Martin de Murua 150 Of. 1004 - 1005  
Edificio Plexus San Miguel Business Center  
San Miguel - Lima 32, PERU

TEL : +51-1-6367303

FAX :

E-MAIL : [enquiries@resetnaval.com](mailto:enquiries@resetnaval.com)

PERSON : Mr. Max Muñoz Moran

WEBSITE : <http://www.resetnaval.com/>

## International agents (CHILE)

### Electronic Marine Ltd

ADDRESS : Uruguay 556 of 404 Valparaiso, CHILE  
TEL : 56-32-2220050  
FAX : 56-32-2593135  
E-MAIL : [marketing@electronicmarine.cl](mailto:marketing@electronicmarine.cl)  
PERSON : Alejandra Palominos (Marketing Manager)  
WEBSITE : <http://www.electronicmarine.cl>

## International agents (URUGUAY)

### microsur

ADDRESS : Carlos María Morales 934, 11200 Montevideo, Uruguay

TEL : 598-2410-1128

FAX : 598-2410-1128

E-MAIL : [microsur@microsur.org](mailto:microsur@microsur.org)

PERSON : Dra.Nermys Hernandez

WEBSITE : <http://www.microsur.org>

## International agents (CHINA)

### RIKEN KEIKI COMMERCIAL(SHANGHAI) CO., LTD.

ADDRESS : HEAD OFFICE : ROOM4A SHANGHAI WATANABE INTERNATIONAL  
COMMERCIAL BUILDING NO.55, LINPING N.ROAD, HONGKOU DISTRICT,  
SHANGHAI, 200086 CHINA

SALES DEPARTMENT OFFICE : ROOM1106 DALIAN LEE WAN HOTEL NO.8,  
MINZHU SQUARE, ZHONGSHAN DISTRICT, DALIAN, LIAONING, 116001  
CHINA

TEL : 86-411-8212-3832

FAX : 86-411-8212-3833

E-MAIL : [dl@rkkc.net](mailto:dl@rkkc.net) (Ms. Sun Jun)  
[dl101@rkkc.net](mailto:dl101@rkkc.net) (Ms. Qu shuai)  
[dl102@rkkc.net](mailto:dl102@rkkc.net) (Ms. Xu fei)

WEBSITE : <http://www.rikenkeiki.asia>



## **International agents (KOREA)**

### **RIKEN KEIKI KOREA CO., LTD.**

ADDRESS : 23, HWAJEONSANDAN 2-RO 134,  
GANGSEO-GU, BUSAN, 46741 KOREA  
TEL : 82-51-712-9900 FAX: 82-51-518-7736  
E-MAIL : [master@rikenkeiki.co.kr](mailto:master@rikenkeiki.co.kr) PERSON: MR.SUN-GU,LEE  
WEBSITE :  
(KOREAN) <http://rikenkeiki.co.kr/bn/>  
(ENGLISH) <http://rikenkeiki.co.kr/bn/english/>

### **HIGH INTEGRATED TECHNOLOGY, INC.**

ADDRESS : 72, SEGYOSANDAN-RO, PYEONGTAEK-SI,  
GYEONGGI-DO, 17843, KOREA  
TEL : 82-31-650-7000 FAX: 82-31-650-7007  
E-MAIL : [info@hitinc.co.kr](mailto:info@hitinc.co.kr) PERSON: MR.HYUNG-SIL, KIM  
WEBSITE :  
(KOREAN) <http://www.hitinc.co.kr/>  
(ENGLISH) [http://www.hitinc.co.kr/?strMode=company\\_e/company](http://www.hitinc.co.kr/?strMode=company_e/company)



## **International agents (TAIWAN)**

### **RIKEN KEIKI TAIWAN CO., LTD. HEAD OFFICE**

ADDRESS : NO.87, YANGMING RD., SHANHUA JEN, TAINAN, 741, TAIWAN  
TEL : 886-6-581-1224  
FAX : 886-6-581-1250  
E-MAIL : [episys@ms22.hinet.net](mailto:episys@ms22.hinet.net)  
PERSON : MR. SEITARO TAKAHASHI (PRESIDENT)  
WEBSITE : <http://www.rikenkeiki.com.tw/admin/news/front/news.php>

### **RIKEN KEIKI TAIWAN CO., LTD. TAICHUNG BRANCH**

ADDRESS : NO.2, ALY.14, LN.150-30, SEC.3, XITUN RD., XITUN DIST., TAICHUNG CITY 407,  
TAIWAN  
TEL : 886-4-2462-5386  
FAX : 886-4-2462-5508  
E-MAIL : [johnny@rikenkeiki.com.tw](mailto:johnny@rikenkeiki.com.tw)  
PERSON : MR. WU WEN CHENG

## International agents (SINGAPORE)

### R K INSTRUMENTS (S) PTE LTD

ADDRESS : 102F PASIR PANJANG ROAD #03-11, CITILINK WAREHOUSE COMPLEX  
SINGAPORE 118530

TEL : 65-6275-3398

FAX : 65-6275-3387

E-MAIL : [rk@rkinstruments.com.sg](mailto:rk@rkinstruments.com.sg)

PERSON : MR. BERNARD QUEK (PRESIDENT)

WEBSITE : <http://www.rkinstruments.com.sg/>



## International agents (MALAYSIA)

### KINETICS SYSTEMS MALAYSIA SDN. BHD.

ADDRESS : 12A, JALAN RINGGIT 23/11 , SECTION 23, 40300 SHAH ALAM, SELANGOR  
DARUL EHSAN MALAYSIA

TEL : 603-5542-2288

FAX : 603-5542-2289

E-MAIL : [ck.chooi@kinetics.net](mailto:ck.chooi@kinetics.net)

PERSON : MR. CHOOI CHOON KEET  
(GENERAL MANAGER)

WEBSITE : <http://www.kinetics.net/>





## **International agents (INDONESIA)**

### **PT. PRATAMA GRAHA SEMESTA**

ADDRESS : KOMPLEKS LODAN CENTER BLOK H-11 JL. LODAN RAYA NO.2 ANCOL - PADEMANGAN  
JAKARTA UTARA 14430 INDONESIA

TEL : 62-21-6900656

FAX : 62-21-6900657

E-MAIL : [sales@ptpgs.co.id](mailto:sales@ptpgs.co.id)

PERSON : MR. FRENGKY TOMBOKAN



### **PT. CENTRADINDO UNITRAS (FOR PERTAMINA & MARINE SECTOR)**

ADDRESS : COMPLEX PERKANTORAN DUTA HARAPAN INDAH JL. KAPUK MUARA RAYA BLOK SS  
NO.3 JAKARTA UTARA 14460 INDONESIA

TEL : 62-21-6624347

FAX : 62-21-6623594

E-MAIL : [centradindo.unitras@gmail.com](mailto:centradindo.unitras@gmail.com)

PERSON : MR. DJOHAN DAHLIAN (MANAGING DIRECTOR)



## International agents (THAILAND)

### TAIYO GASES CO., LTD.

ADDRESS : 17TH FLOOR SERM-MIT TOWER, 159 SUKHUMVIT 21 ROAD, NORTH  
KLONGTOEY, WATTANA, BANGKOK 10110 THAILAND

TEL : 66-2-260-2691

FAX : 66-2-260-2690

E-MAIL : [hato@taiyogases.th.com](mailto:hato@taiyogases.th.com)

PERSON : MR. KAZUNARI HATO

WEBSITE : <http://www.taiyogases.th.com/>

## International agents (INDIA)

### TRITECH

ADDRESS : 121,VEENA INDUSTRIAL ESTATE, OPP.FITWELL HOUSE, L.B.S.MARG,  
VIKHROLI(W) MUMBAI-400 083 INDIA

TEL : 91-22-2577-7288, 6796-9990

FAX : 91-22-6796-9991

E-MAIL : [tritec@vsnl.com](mailto:tritec@vsnl.com)

PERSON : MR. NARESH SHARMA MR. JIGNESH SHAH

WEBSITE : <http://www.tritech.in/>



## International agents (VIETNAM)

### VIETNAM GAS DETECTOR ONE MEMBER CO., LTD.

ADDRESS : 79 Ly Chinh Thang St, ward 8, Dist 3, HCMC, Vietnam

TEL : +84-(0)28-35262986 / 35262987

FAX : +84-(0)28-35262980

E-MAIL : [info@vina-gasdetector.vn](mailto:info@vina-gasdetector.vn)

PERSON : MR. CAO MINH LOI (Director)

WEBSITE : <http://vina-gasdetector.vn/>



## International agents (PHILIPPINES)

### PILIPINAS TRADE GAS, INC. (PTGI)

ADDRESS : 23RD FLOOR ONE CORPORATE CENTER DONA JULIA VARGAS AVE.,  
CORNER MERALCO AVENUE, ORTIGAS CENTER PASING CITY,  
PHILIPPINES

TEL : 632-635-7320

FAX : 632-635-7322

E-MAIL : [gerry.gueco@yahoo.com.ph](mailto:gerry.gueco@yahoo.com.ph)

PERSON : MR. S. HARA (PRESIDENT)  
MR. GERRY C. GUECO (IN CHARGE)



## International agents (AUSTRALIA)

### CONTROL EQUIPMENT PTY. LTD.

ADDRESS : UNIT 1/3 DEAKIN STREET, BRENDALE QLD 4500, AUSTRALIA

TEL : 61-7-3481-9000

FAX : 61-7-3481-9088

E-MAIL : [sales@controlequipment.com.au](mailto:sales@controlequipment.com.au)

PERSON : MR. GREG LOVE (GENERAL MANAGER)

WEBSITE : <http://www.controlequipment.com.au/>





## **International agents (GERMANY)**

### **RIKEN KEIKI GmbH**

ADDRESS : Theodor-Heuss-Allee 112, 60486 Frankfurt am Main, Germany

TEL : +49-6966-7741-460, 461

E-MAIL : s-ono@rikenkeikigmbh.de

PERSON : MR. SHINTARO ONO(Managing Director)

WEBSITE : <http://www.rikenkeiki.com/de/>



## International agents (GREECE)

### ZERVOUDAKIS MARINE SUPPLIES LTD.

ADDRESS : 31, MILOU STREET, PIRAEUS 18545, GREECE

TEL : +30-210-4623700

FAX : +30-210-4627900

E-MAIL : [zerv@otenet.gr](mailto:zerv@otenet.gr)

PERSON : MR. JOHN ZERVOUDAKIS

WEBSITE : <http://www.zervoudakis.gr/>



## International agents (THE NETHERLANDS)

### GMS Instruments B.V.

ADDRESS : Driemanssteeweg 190, 3084 CB, Rotterdam, The Netherlands

TEL : +31102938860

E-MAIL : [sales@gms-instruments.nl](mailto:sales@gms-instruments.nl)

PERSON : MR. SEBASTIAN KELDERMAN AND MR. MARKUS FRANK

WEBSITE : <http://gms-instruments.nl/>

## International agents (NORWAY)

### MARTIN BRUUSGAARD & CO. AS.

ADDRESS : LOKKETANGEN 20A, 1337 SANDVIKA NORWAY  
P.O. BOX 3, 1301 SANDVIKA NORWAY

TEL : +47-6754-9330

FAX : +47-6754-9331

E-MAIL : [dag@bruusgaard.no](mailto:dag@bruusgaard.no)

PERSON : MR. DAG MAARTMANN

WEBSITE : <http://www.bruusgaard.no/>



## International agents (TURKEY)

### DOGANAK COLL. CO.

ADDRESS : KARAKOY, OKCUMUSA CADDESİ, IPEK CIKMAZI,  
BOGAZICI HAN NO:6 KAT:2  
34420 ISTANBUL, TURKEY

TEL : +90-212-244-5318 / 245-2512

FAX : +90-212-243-5704

E-MAIL : [doganak@doganak.com](mailto:doganak@doganak.com)

PERSON : MR. MEHMET ALI AKYUZ

WEBSITE : <http://www.doganak.com/>





## International agents (U.K.)

# WEATHERALL EQUIPMENT & INSTRUMENTS LTD.

ADDRESS : UNIT 1 STATION APPROACH, WENDOVER AYLESBURY,  
BUCKS HP22 6BN ENGLAND

TEL : +44 1296 622180

FAX : +44 1296 624955

E-MAIL : [sales@weatherall-uk.com](mailto:sales@weatherall-uk.com)

PERSON : MR. R.H.C. WORTHINGTON

WEBSITE : <http://weatherall-uk.com/>



## International agents (U.A.E.)

### METRO MAC

ADDRESS : WS 104, DUBAI MARITIME CITY (DMC), DUBAI, U.A.E.  
P.O.BOX: 13485 DUBAI U.A.E.

TEL : +971-4-5636100

FAX : +971-4-5519973

E-MAIL : [sales@metromac.com](mailto:sales@metromac.com)

PERSON : MR. K.K. KUTTY  
(MANAGING DIRECTOR)

WEBSITE : <http://www.metromac.com/>



## International agents (ISRAEL)

### MODCON SYSTEMS LTD.

ADDRESS : MODCON HOUSE M. BORNSHTEIN ST.,  
SOUTH AKKO INDUSTRIAL PARK, 24222 ISRAEL

TEL : +972-4-9553955

FAX : +972-4-9553956

E-MAIL : [gregorys@modcon.co.il](mailto:gregorys@modcon.co.il)

PERSON : MR. GREGORY SHAHNOVSKY

WEBSITE : <http://www.modcon-systems.com/>



## **International agents (SOUTH AFRICA)**

### **I.S.L. ENTERPRISES (PTY) LTD.**

ADDRESS : 29 KLOSSER STREET PAROW 7500 SOUTH AFRICA  
P.O.BOX 72 PAROW 7499 SOUTH AFRICA

TEL : +27-21-930-2354

FAX : +27-21-930-2043

E-MAIL : [istvanisl@xsinet.co.za](mailto:istvanisl@xsinet.co.za)

PERSON : MR. I.S. LADANYI





## **International agents (RUSSIA)** **TAIRIKU TRADING CO., LTD.**

ADDRESS : Head office in Tokyo, Japan KAJITANI DAIICHI BUILDING, 21-10,  
SHINKAWA 2-CHOME, CHUO-KU, TOKYO 104-0033, JAPAN

TEL : +81-3-6222-0194 FAX: +81-3-6222-0201

E-MAIL : [tairiku@tairiku-trading.co.jp](mailto:tairiku@tairiku-trading.co.jp)

PERSON : MR. MORITA

WEBSITE : <http://www.tairiku-trading.co.jp/?lang=en>

## **OOO"TAIRIKU MOSCOW LTD."**

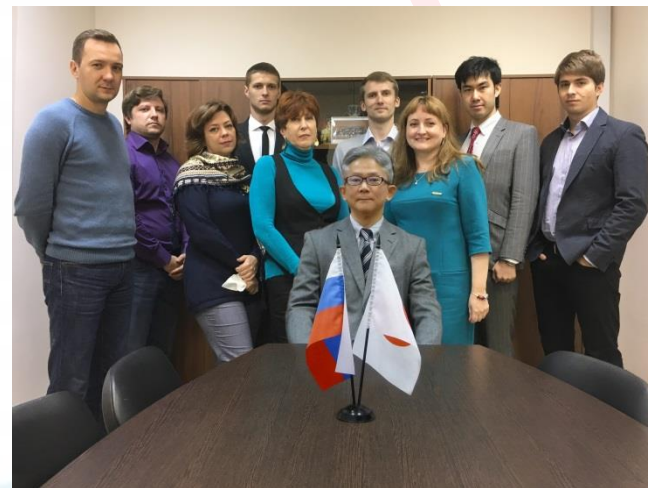
ADDRESS : RUSSIAN FEDERATION, 119049,  
MOSCOW, KOROVY VAL STREET,7,  
BUILDING 1, FLOOR 2,OFFICE 12

TEL : +7-495-237-18-82 +7-495-237-19-26

FAX : +7-495-931-99-47

E-MAIL : [tairiku.alpeev@co.ru](mailto:tairiku.alpeev@co.ru), [ofistrk@online.ru](mailto:ofistrk@online.ru)

PERSON : MR. ALPEEV M.A., (MANAGER)







**RIKEN KEIKI**

*We are a **pioneer** in creating **safe working** environments for workers.*