

AUTOMATIC FIREFIGHTING
SYSTEMS

Oil & Gas





Handling oil and natural gas

Crude oil is sent to a refinery for processing. It is transported through pipelines, trucks, tankers or oil tankers.

The elements involved in this activity are highly complex, and so are the facilities in which they are housed. The main ones are:

- *Drills*
- *Pumping equipment*
- *Waste pits and evaporation ponds*
- *Storage tanks*
- *Coalbed methane installations and components*
- *Shale Gas*
- *Treatment plants*

Oil & Gas refers to products extracted from the earth, which are used as fuels after extraction and processing. Crude oil and natural gas are non-renewable energy sources, also known as fossil fuels.

Before oil and natural gas can be sold, the liquids must go through a treatment process in which water, hazardous gases and other impurities are removed. Some of the treatments may be performed in oil wells themselves. After that, the natural gas is sent through a pipe to a centralized processing facility, such as a gas plant or refinery. These are facilities where oil and gas are extracted from the earth and processed for use. The facilities comprise complex units (atmospheric distillation, isomerization, hydrocracking, etc.) for processing into the final product.

All complex elements that make up these processes related to oil & gas give us an idea of the importance of proper protection.

Fire and similar elements pose a great danger to these plants. In addition to fire-related risk, the chances of an explosion are high, which is why these plants are usually located in places away from urban centres.

The consequences of a fire in these facilities would be very serious both economically and environmentally, not to mention the great risk for people. Efficient protection is extremely important.

Oil & gas storage and treatment plants comprise multiple spaces that involve ignition risks.

In addition to the flammable liquid or gas itself, usually stored in tanks, we must take into account the risks involved in equipment such as transformers, generators, computer and electronic equipment rooms, electrical rooms, and other ancillary facilities.

Fire points and prevention

STORAGE TANKS

The high combustibility of oil & gas is a well-known fact. To the risk of fire we must add the risk of explosion due to the possible presence of explosive atmospheres.

Factors that may result in a fire are mostly external and related to:

- Environment
- Maintenance operations
- Internal combustion vehicles or machinery

Protection:

The best protection is through foam or dry chemicals. Both extinguishing agents are safe, but dry chemicals are used more often with flammable liquid, gas and chemical fires. They both work by covering the tank and extinguishing the fire by smothering, totally eliminating the O₂ essential to the existence of fire.

ELEMENTS USED FOR EXTRACTION AND TEMPORARY STORAGE

Certain areas such as extraction wells, drills, surface reservoirs and other elements such as pumping equipment, etc., involve a high risk of fire and must be protected.

Protection

The fact that it is open-air is its main feature, so protection takes place through local application of agents such as foam or dry chemicals.

Choose the most appropriate extinguishing system for each room based on the hazard and type of fire possible. Different protections can exist within the same oil rig, such as:



inert gases



chemical gases



dry chemicals



foam



TRANSFORMERS and GENERATORS:

Transformer rooms house electromagnetic devices which can increase or decrease the electric voltage and current.

Power generators are machines that move an electric generator via an internal combustion engine.

They are used as a power backup to avoid factory downtimes in the event of power cuts. Generators may even be used in factories where there is no mains power supply, usually in little-inhabited remote areas with little infrastructure.

In case of fire in these elements, the value of losses depends not only on the material value of the equipment, but also on the indirect consequences which can be dramatic for the installation, cutting power supply and forcing production to grind to a halt.

Given the importance of the transformers and their cost, the need arises for the installation of fixed fire protection systems.

Among the transformers in power rooms, oil-filled ones are a particularly serious fire hazard, since this oil has a relatively low flashpoint and therefore a higher risk of fire with a considerable release of smoke.

PROTECTION:

At SIEX we are highly experienced in the protection of transformers, both oil-filled and dry. The main systems adopted for these risks are CO₂ and Water Mist. Since other gases require sealed enclosures and due to the transformer's ventilation needs, this does not happen often unless gates are installed to ensure proper sealing. The foam and dry chemical could damage transformers and generators since, once the fire is extinguished, the agent itself can be considered waste. The fact that the gases and water mist do not cause damage in case of accidental discharge also needs to be taken into account.

The choice of extinguishing agent will depend on the size of the room where the risk is located and if it is protected with total flooding or local application.

In the event that the transformer is located where there is a continuous traffic of people, we should discard the use of CO₂ because of its high asphyxiation capacity.

ELECTRICAL AND CONTROL ROOMS

Electrical rooms, such as control rooms or electrical panels, store all electrical and installation automation systems. These are strategic hubs for the proper operation of all systems.

As is to be expected, there are several rooms of this type throughout the plant.

Electrical rooms are considered capable of being occupied because authorized personnel may enter at any moment, so a clean and safe agent must be used. Solutions normally taken to protect these areas are the SIEX-HC™ 227 and INERT-SIEX™ systems.

The main causes of fire which can occur in this sort of installation are due to internal factors such as breaker sparks, short-circuits, overloads, static electricity, and external factors such as dirt, heat-generation installations, sunlight, and environmental thermal conditions.

The most effective protection method for spaces of this type is total flooding, involving the release of an extinguishing agent into the enclosure so that a minimum concentration is reached throughout the hazard area.

Depending on existing dimensions, you can choose an individual extinguishing system for each room or a single system with selector valves. This way we can protect multiple spaces with a single cylinder bank, by optimizing the amount of gas and storage space for cylinders.

DATA ROOMS

Data rooms are strategic points. They house all a company's information, one of its greatest assets.

In case of fire, losses are significant, considering the chain reaction that occurs after a fire in these enclosures: loss of stored often irrecoverable information; losses in productive time where normal factory production is impossible due to data unavailability; and even losses incurred as a result of time spent on reacquiring lost information.

Protection

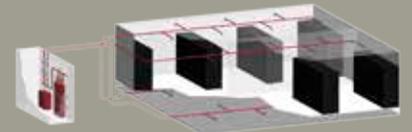
For these facilities we recommend INERT-SIEX™, SIEX-HC™ 227 and SIEX™ WATER MIST SYSTEM. They all act without residue, quickly and effectively, which is crucial for preventing damage.

The use of water mist is particularly advisable due to its combined action of smothering the fire and cooling the atmosphere. To these features we must add the fact that the water carries smoke and suspended particles as residues, which can cause damage and affect visibility.

SELECTION OF AGENT BASED ON ENCLOSURE FEATURES

TOTAL FLOODING SYSTEM:

The system involves the discharge of agent in the area so that a minimum design concentration is achieved throughout the hazard area.



Importance of hazard area size:

The protection system and the type of agent selected depends largely on the size, shape and arrangement of the room itself. Pressure is another determining factor.

LOCAL APPLICATION

Supply of clean agent, permanently connected to a fixed piping system with nozzles arranged to discharge directly on the fire.

This system should be used in cases where the hazard is not confined or where the enclosure does not meet the requirements for total flooding.

Solutions

DRY CHEMICAL

The SIEX™ IND systems use ammonium phosphate, a safe extinguishing agent used mostly in flammable liquid, gas and chemical fires. It is a white solid mixture of several components, finely divided and with a high dispersal capacity in the space. It is therefore an agent suitable for applications in the given hazard.

ABC POWDER: SOLIDS, LIQUIDS AND FLAMMABLE GASES
BC POWDER: LIQUID FUELS
D POWDER: COMBUSTIBLE METALS
K POWDER: FATS AND OILS.

It is used to extinguish fires in special hazards requiring large quantities of this extinguishing agent, such as class B and C fires and open spaces (local application). They can be used for both total flooding and local application. The system consists of two main parts: extinguishing agent container (tank or cylinder) and propellant.

SIEX™ IND offers a wide variety of large-capacity tanks. For smaller-capacity requirements, we have modular cylinders which can be placed in a bank arrangement to tailor the quantity of agent to the needs of the hazard.

SIEX™ IND has specific discharge nozzles for total flooding, local application, and also flat discharge nozzles for protection with a dry chemical curtain.

Dry chemical has a low market price, is easy to refill, and is accessible anywhere in the world.

AUTOMATIC AND STANDALONE EXTINGUISHING OPERATION.
EFFECTIVE FOR DIFFERENT KINDS OF HAZARD AND DESIGN CONSTRAINTS.
FAST ACTING, PREVENT SERIOUS DAMAGE TO THE PRODUCTION CHAIN.
NON-CORROSIVE AND NON-CONDUCTIVE.
DO NOT DAMAGE THE OZONE LAYER.
THEY HAVE NATIONAL AND INTERNATIONAL CERTIFICATIONS AND APPROVALS.

FOAM PREMIX

SIEX™ FOAM PREMIX is designed to act against the most adverse burning liquid situations that require rapid actuation to control them.

The system is designed to create a homogeneous layer of low-expansion foam on the surface of class B materials.

The foam is created by adding air to a foam concentrate and water solution stored in our tanks, at the specific concentrations for extinguishing, calculated by our design team. It is therefore an autonomous system that does not require an external water supply.

The foam layer works prevents the creation of flammable vapours, eliminates air and cools the fuel and hot surfaces. For this to occur, nozzles should be suitably distributed and all system components which contribute to the discharge should be efficiently and instantaneously activated.

The units are supplied with tanks that contain the agent in the concentration stipulated for use.



CARBON DIOXIDE

CO₂ has several properties that make it a useful agent for extinguishing fires. Since CO₂ is a gas, it can penetrate and spread to all areas of the fire. Both as a gas and as fine solid particles called dry ice or snow, it does not conduct electricity and can be used against fires in live electrical equipment. Another advantage is that it enables protection in areas with openings.

CUSTOM APPLICATION
IMMEDIATE EXTINGUISHING
DOES NOT CONTAMINATE PRODUCTS
DOES NOT DAMAGE EQUIPMENT
COST-EFFECTIVE AND EASY TO OBTAIN
APPROPRIATE AND STABLE IN EXTREME TEMPERATURES

WATER MIST

MAXIMUM EXTINGUISHING WITH MINIMUM WATER DISCHARGE
SMALLER STORAGE AND INSTALLATION DIAMETERS NEEDED
REDUCES THE HEAT ENERGY, DISPLACES OXYGEN AND COOLS THE FUEL.
HARMLESS: DOES NOT CONTAMINATE OR ALTER GOODS
HIGH PERMANENCE IN SUSPENSION, KNOCKING DOWN PARTICLES OR SMOKE.
PREVENTS REACTIVATION

CHEMICAL AGENTS

IDEAL FOR OCCUPIED AREAS
INCREASES THE SAFETY MARGIN
HIGH EXTINGUISHING CAPABILITY
STORAGE FROM 24 TO 60 BAR.
NON-CORROSIVE
NON-CORROSIVE ELECTRICAL AND ELECTRONIC

INERT AGENTS

IDEAL FOR OCCUPIED AREAS
OBTAINED FROM THE ATMOSPHERE
LOW-COST AGENT
EXCELLENT VISIBILITY FOR EVACUATION
CHEMICALLY NEUTRAL
STORAGE PRESSURES OF 150, 200 AND 300 BAR.
LONG PIPE RUNS.



It is a clean agent that allows a wide range of possibilities upon discharge and can thus effectively protect a great variety of hazards.

Refilling it is easy and cost-effective, which makes it the most widely used gaseous extinguishing agent in the world.



Cutting-edge technology that delivers tiny water mist droplets thanks to which the system is suitable for protecting multiple hazards, including those where traditional water systems are not recommended, such as electrical equipment or combustible liquids.



Clean agent with very high extinguishing power which therefore requires very little storage space. It is also a clean and non-toxic agent which enables safe evacuation.



Stored at high pressures, it allows for long pipe runs.

Suitable for occupied areas and leaves no residue, making it suitable for the protection of a wide variety of hazards.

OTHER SPECIAL HAZARDS PROTECTING BY SIEX:

SERVICE STATIONS

ARCHIVES AND LIBRARIES

DPCs

PAINT SPRAY BOOTHS

ELECTRICAL PANELS

INDUSTRIAL KITCHEN

TURBINES AND GENERATORS

ROAD TUNNELS

NATURAL GAS PLANTS

CLEAN ROOMS

CABLE TUNNELS

TELECOMMUNICATION CENTRES

HOTELS

HOSPITALS

EDUCATIONAL ESTABLISHMENTS

TRAIN AND UNDERGROUND STATIONS

TRAINS

TRANSFORMERS

OFFSHORE PLATFORMS

SOLAR THERMAL PLANTS

MACHINE TOOLS

PRINTING INDUSTRY

HISTORIC BUILDINGS

ROBOTIC PARKINGS

WIND TURBINES

STEEL INDUSTRY

BANKS

OFFICES

LARGE VEHICLES

CONVEYOR BELTS

GAS PUMPS

OIL & GAS

TIMBER INDUSTRY



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