

BERNARD[®]
CONTROLS

//////////////////// Invest in Confidence //////////////////////



Oil & Gas
Electric actuation

75 YEARS

**OF KNOW-HOW AND CONTINUOUS EXPERIENCE.
BERNARD CONTROLS OFFERS COMPLETE SOLUTIONS
FOR OIL & GAS FLUID AUTOMATION.**



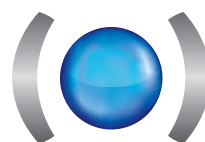


invest in

experience

ADNOC, ARAMCO, BP, ELECTRABEL, ENI, EUROENERGO, EXXON,
GAZ DE FRANCE, HELLENIC PETROLEUM, KINDER MORGAN, KNPC,
KOC, MOL, NATO, NIOC, OMV, PEMEX, PERTAMINA, PETROBRAS,
PETROCHINA, PETRONAS, POGC, PTT, QATAR PETROLEUM, Q8,
ROSENERGO, ROSNEFT, SABIC, SHELL, SINOPEC, SONATRACH, TOTAL...

BERNARD CONTROLS has been approved by major
oil & gas companies worldwide. The trust granted
every day by our customers drives us.



BERNARD[®]
CONTROLS



BERNARD CONTROLS
is ISO 9001-2000 certified.
Moreover, the quality of
our products for explosive
atmospheres has been recognized
by key certifications: ATEX, CEPEL,
IECEX, NEMA 7 and 9, GGTN.



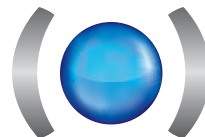


invest in reliability

Security is critical for Oil & Gas processes.

That is the reason why our R&D and Production teams are equipped to check the conformity of products to specifications. Tests are performed under conditions which reproduce as much as possible sites' conditions (heat, cold, humidity, vibrations, torque, service duty...).

In order to maintain high product quality, BERNARD CONTROLS is engaged in continuous improvement and quality management processes. **Our products and organization have been certified by major international bodies** and according to main standards: ATEX, BUREAU VERITAS, CEPEL, CSA, FM, GGTN, IECEX, INERIS, ISO 9001, NEMA 7 and 9, TÜV....



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invest in
expertise

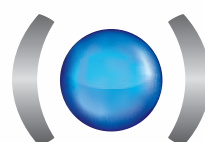




As one of the world leaders in valve actuation, BERNARD CONTROLS has focused its expertise on electric actuators and associated control technologies. Relying on years of experience and customers' feedback, we have developed reliable products in line with end-users' requirements:

- > Heavy duty design,
- > User friendly & intuitive controls,
- > Non intrusive settings,
- > Absolute sensors for accurate information at any time without battery,
- > Monitoring functions for preventative maintenance,
- > Declutchfree handwheel,
- > Separated control box configuration on request,
- > Bus continuity for easy site management...

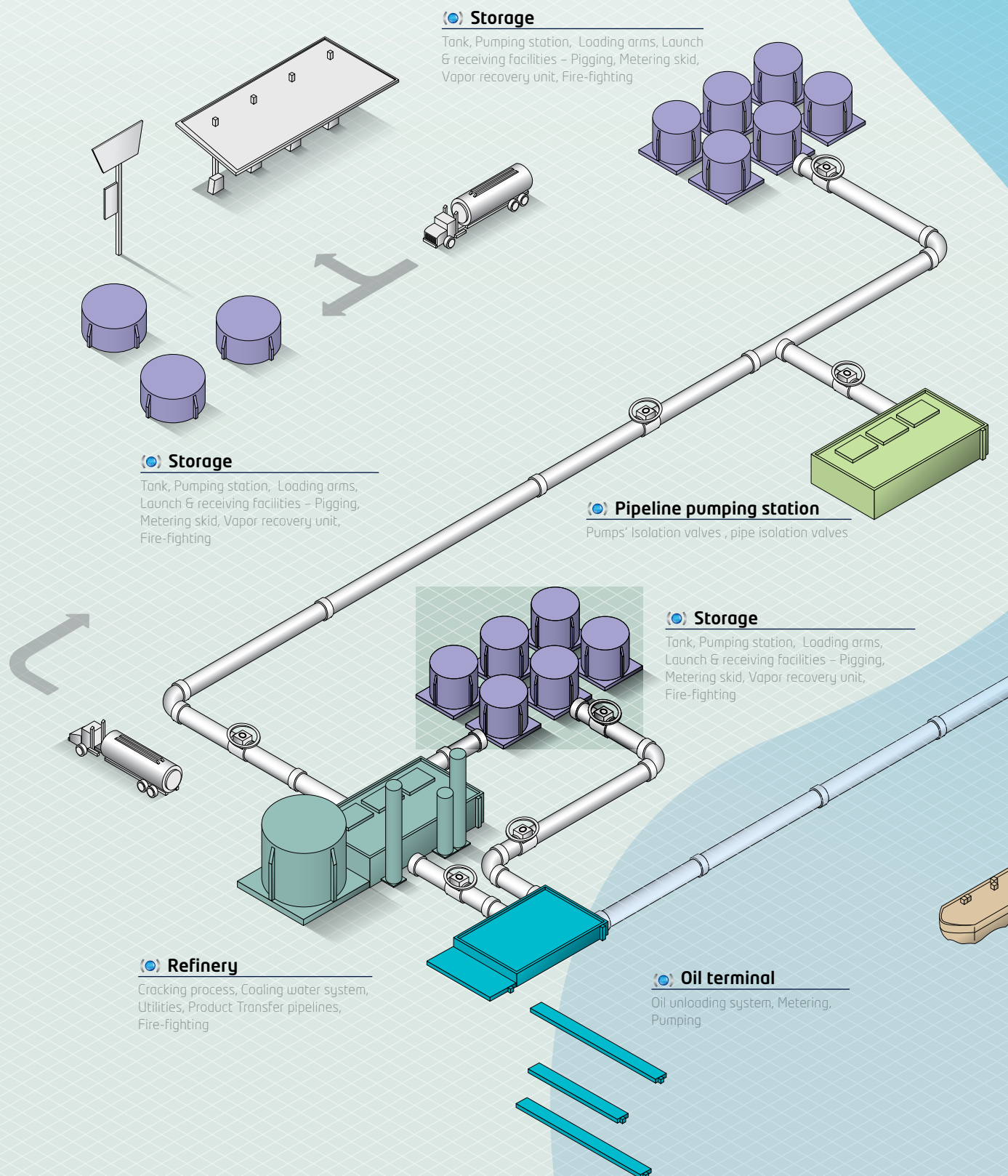
BERNARD CONTROLS' solutions are thus suitable for all applications in the Oil & Gas industries, from extraction to transport and storage, including processing.

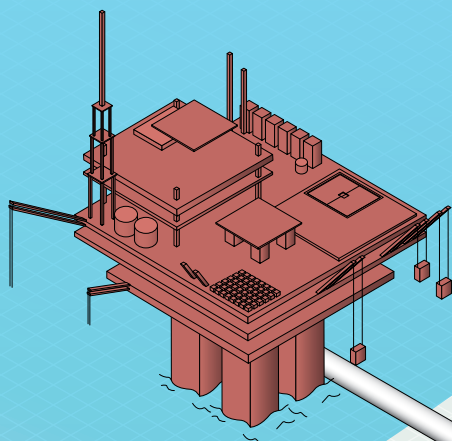


**BERNARD[®]
CONTROLS**

BERNARD CONTROLS partner of the Oil industry

BERNARD CONTROLS actuators are mainly used on isolation valves at all stages of the oil production process.





Platforms

Manifold, Chokes valves on/off, and modulating

Refinery

Cracking process, Cooling water system, Utilities, Product Transfer pipelines

Oil terminal

Ballast & oil loading system, Metering, Pumping

Separation unit

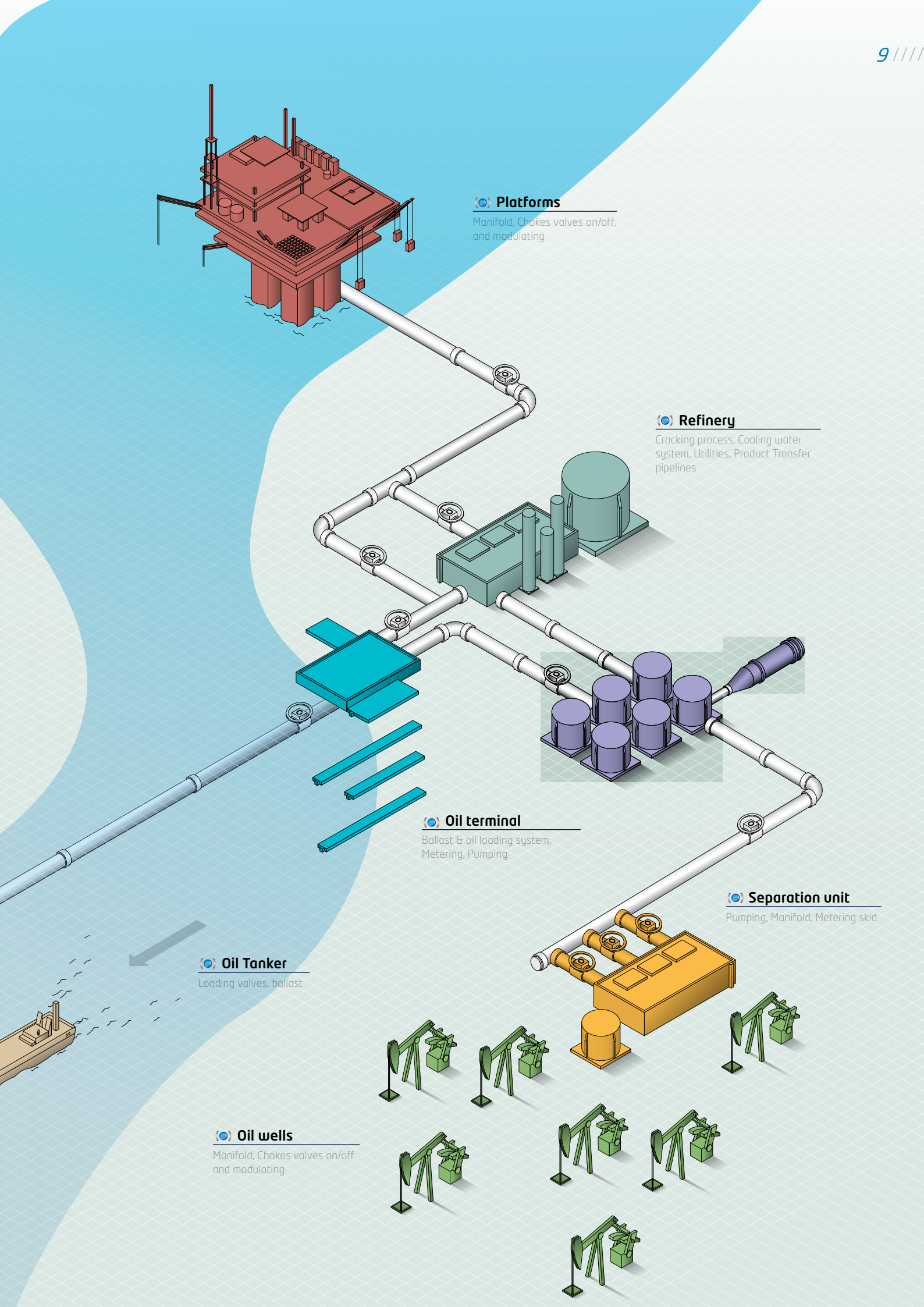
Pumping, Manifold, Metering skid

Oil Tanker

Loading valves, ballast

Oil wells

Manifold, Chokes valves on/off and modulating



BERNARD CONTROLS

partner of the Gas industry

Our actuators are used for all types of applications in the Gas sector.

Storage

Compressor, Gas sphere, Inlet & Outlet gas valves, Pressure reducer, Fire-fighting

Consumers

Recompression unit

Compressor, Metering system, Modulating valves

Storage

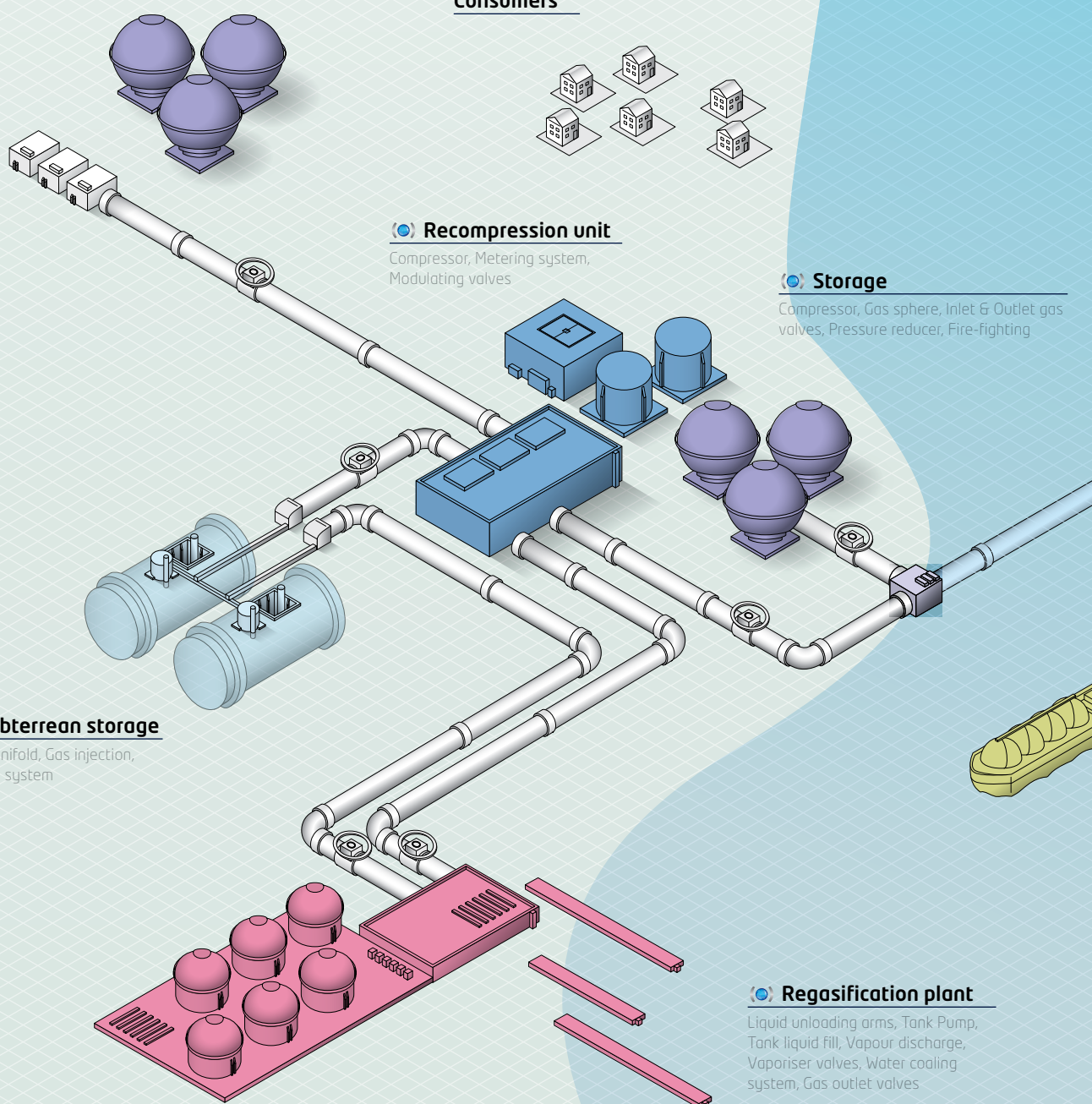
Compressor, Gas sphere, Inlet & Outlet gas valves, Pressure reducer, Fire-fighting

Subterrean storage

Wells manifold, Gas injection, Metering system

Regasification plant

Liquid unloading arms, Tank Pump, Tank liquid fill, Vapour discharge, Vaporiser valves, Water cooling system, Gas outlet valves



Platforms

Manifold, Chokes valves on/off,
Chokes valves modulating

Gas wells

Manifold, Chokes valves on/off
and modulating

Liquefaction train

Compressor, Dryer, Metering system,
Jetty system, Fire-fighting

Storage

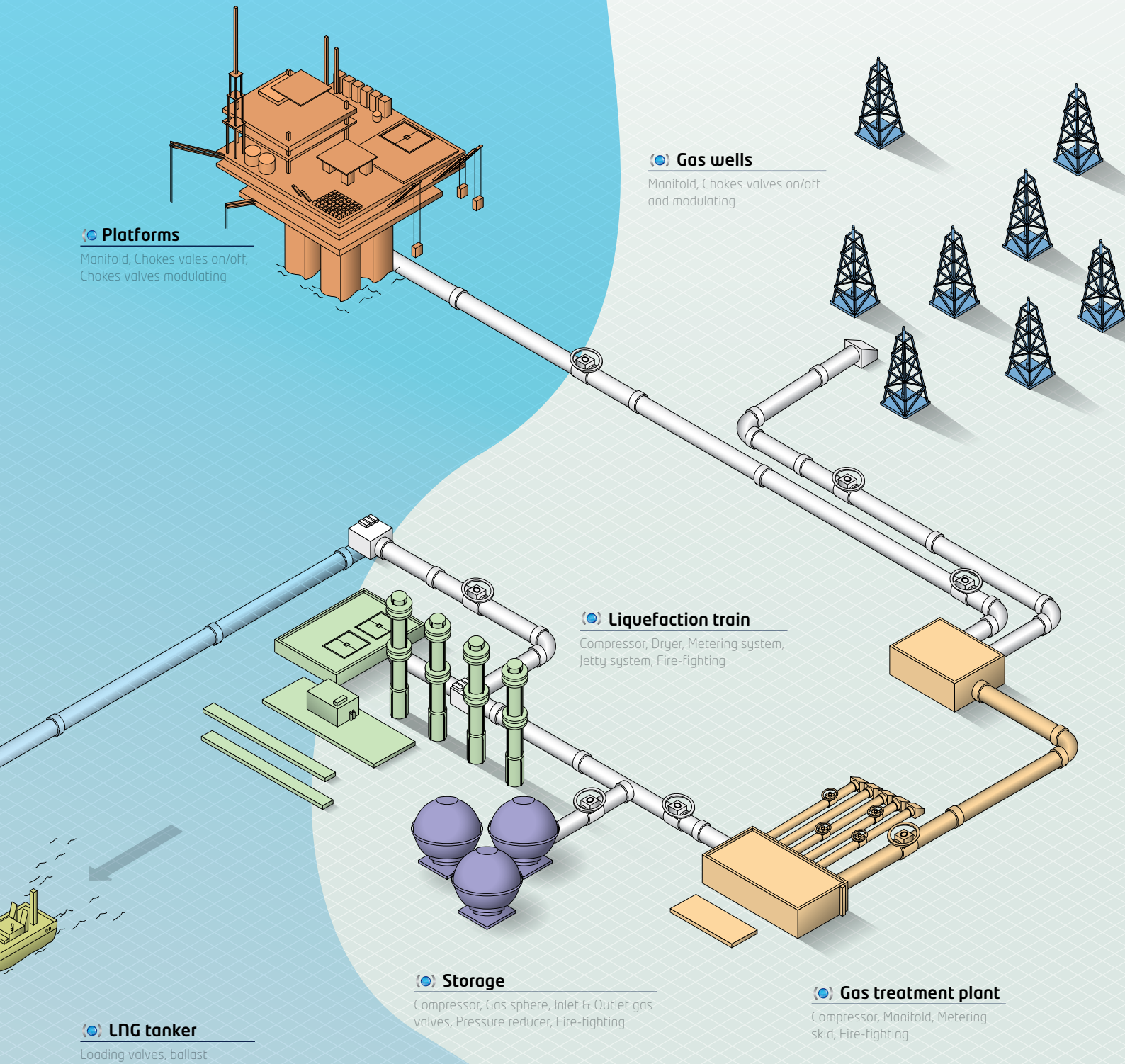
Compressor, Gas sphere, Inlet & Outlet gas
valves, Pressure reducer, Fire-fighting

Gas treatment plant

Compressor, Manifold, Metering
skid, Fire-fighting

LNG tanker

Loading valves, ballast





SOLUTIONS FOR storage

BERNARD CONTROLS offers durable solutions for all types of applications on Oil & Gas storage installations.



Gas Processing & Storage in Slovenia.



Tank Farm in Spain, Shut-off valves and fire-fighting system.

➤ Declutch-free handwheel

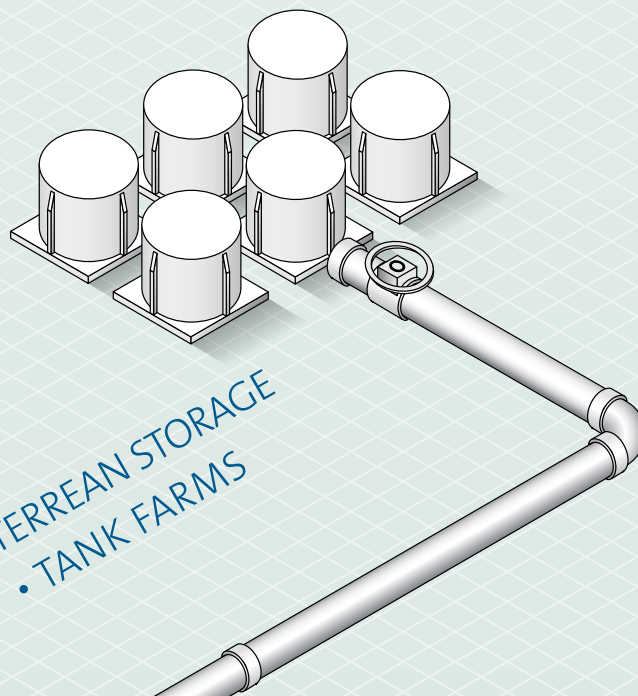


BERNARD CONTROLS' **declutch-free handwheel** is a patented manual override system. The differential gear drive allows the handwheel to be operated without releasing a clutch beforehand.

The handwheel can therefore be operated under all conditions, even when a high torque is applied to the valve (i.e. wedge gate valve closed tight). Electric command has priority over manual override.

BERNARD CONTROLS Customer service on site, Refinery in Poland.

- FIRE FIGHTING SYSTEMS
- LOADING STATIONS
- METERING SKIDS
- PIGGING
- PUMPING
- SUBTERRANEAN STORAGE
- TANK FARMS



➤ Fire-fighting systems

Fire could be a major cause of damage in Oil & Gas installations. BERNARD CONTROLS offers effective actuation solutions for fire-fighting systems. Our actuators are particularly suitable for isolation valves such as the ones on sprinklers or on foam extinction devices.

France, Storage - Fire-fighting system



ZOOM ON

Failsafe

BERNARD CONTROLS offers failsafe actuators with **automatic spring-return**. With this technology, the activation of an emergency signal or simply the loss of power supply triggers the immediate opening or closing of the backup device, without the need for any external power source.



BERNARD CONTROLS FQ actuators are often used for storage and distribution of gas and dangerous liquids, fire protection systems...



SOLUTIONS FOR

Storage

➤ Fieldbus solutions for MOVs control

Fieldbus is advantageous because it allows getting more information while reducing the overall wiring on site. BERNARD CONTROLS actuators can be connected to most of the standard fieldbus available on the market (Profibus DP, Foundation fieldbus, Modbus RTU...).

In order to ease the command and control of large quantities of MOVs, **BERNARD CONTROLS** has developed a **turnkey fieldbus communication solution** – the Master Station – which offers 3 key advantages to end users:



From the touch screen or through optional PC workstation, installation is under control thanks to BERNARD CONTROLS Master Station.



- **RELIABILITY:**

Robust PLC technology, simple or redundant configurations, 1 to 3 line starts

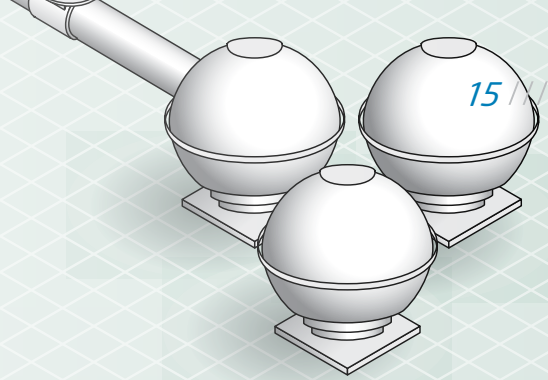
- **EFFICIENCY:**

Fast response time, Standard scan time from 1 to 3 s whatever the distance and number of actuators connected, Preventative maintenance thanks to INTELLI+ intelligent actuators

- **USER FRIENDLY:**

Up to 120 actuators and 10km distance, Open protocol Profibus DPV1, Overall start up time reduced to the minimum

- FIRE FIGHTING SYSTEMS
- LOADING STATIONS
- METERING SKIDS
- PIGGING
- PUMPING
- SUBTERRANEAN STORAGE
- TANK FARMS



On the other hand, security is critical for complex processes. Most fieldbus systems clearly offer a **good level of reliability, especially with PLC technology and redundant communication systems.**

However, when an actuator has to be removed from the field, for instance for maintenance operations, that breaks up the continuity of the line and the whole installation is affected since the signal cannot circulate anymore.

BERNARD CONTROLS proposes a special device to deal with such issue and **ensure bus continuity.** Our actuators can host a special Profibus connection board, located in the cover of the wiring compartment. This cover can simply be removed from the actuator and closed tight by a special type plate, ensuring continuity of signal throughout the line.

Moreover, BERNARD CONTROLS explosion proof actuators and Master Station can include a **lightning protection** which acts as a shield and discharges overvoltage to avoid any damage in case of lightning stroke on the line. Voltage goes back to standard level and valves' automation can resume.



Subterranean gas storage, France

More information on our Master Station solution in our dedicated catalogue A108.
Downloadable on www.bernardcontrols.com.



Storage Facility, China



SOLUTIONS FOR

extraction

When it comes to fossil fuel extraction, flow control is crucial in order to maximize the final quantity produced. That is the reason why each site requires high performance control technologies and heavy duty devices so as to ensure safe and efficient extraction of oil or gas. BERNARD CONTROLS has kept these requirements in mind when designing its solutions for Oil & Gas wells and platforms.



➤ High Duty Modulating



Because extraction means managing various types of flows, modulating actuators are frequently used at this stage. Durability and accuracy are amongst the most important criteria to consider for a modulating actuator. Depending on operation frequency and accuracy of positioning, BERNARD CONTROLS has defined **3 modulating classes**, **Class III (positioning)**, **Class II (precision positioning)**

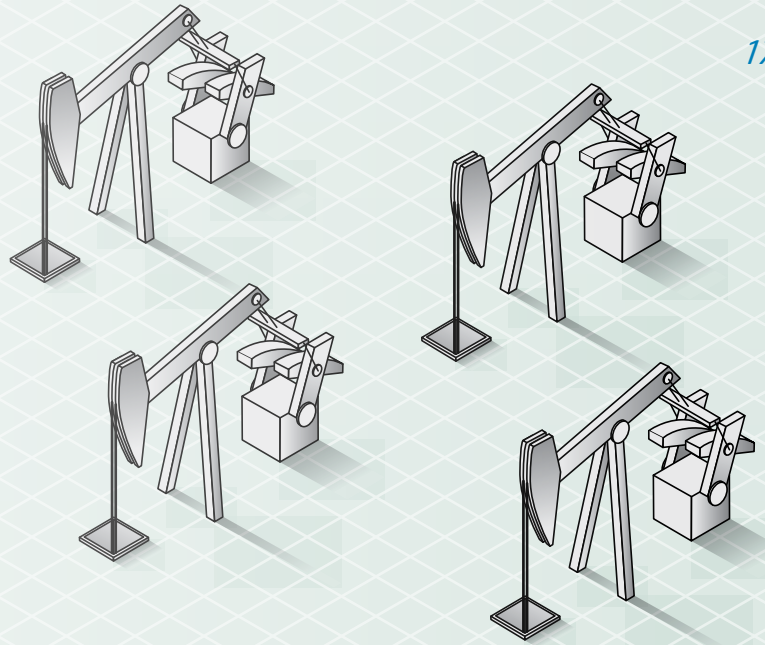
or Class I (fast positioning) – which have deeply inspired the European electric actuator standard EN 15714-2.

We offer actuators in each type of class, addressing all your needs up to high duty fast and precise modulating valve automation.

[More information about modulating classes in our User's Guide \(A104\).](#)

BERNARD CONTROLS Electric actuator

- EXTRACTION WELLS
- OFFSHORE



➤ Wide range of performing motors



Depending on operation type, selection of the actuator's motor proves to be a key step to ensure the reliability of the device. In order to secure good achievement of modulating operations, the actuator's motor must stand up repetitive starts under load without overheating.

BERNARD CONTROLS proposes a wide range of motors featuring the S4 duty rating according to IEC34 standard.

More information about duty cycles and IEC34 standard in our User's Guide (A104).

Downloadable on www.bernardcontrols.com.



➤ Adapted to most environments

Fossil fuel extraction often takes place in difficult environmental conditions such as cold or hot temperature, off-shore corrosive atmosphere, abrasive atmosphere...

BERNARD CONTROLS actuators are suitable to operate in harsh operating conditions. Their robust construction allows them to work under various environmental conditions such as desert sand blast, cold (down to -50°C), hot (up to $+70^{\circ}\text{C}$), tropical, seismic or marine.

BERNARD CONTROLS actuators are ATEX certified for use down to -50°C .





SOLUTIONS FOR transport

Security is critical at all stages of the oil or gas production cycle. However, transport requires specific attention as it implies kilometers of pipelines going across fields, deserts, seas... until these reach storage or distribution facilities. It is thus not always easy to quickly detect, evaluate and solve a problem when it happens in a remote or hardly accessible area. BERNARD CONTROLS commits to providing intelligent actuation solutions enhancing the security level of your site, while remaining user friendly.



France, Gas network compression unit.

➤ Powerful actuation



In order to isolate large valves fitted on pipes, **high starting torques** are required. BERNARD CONTROLS' asynchronous motors used for Explosion proof series have high ratio between starting torque and nominal torque. With this design, actuators can **not only ensure unseating of valves** which are seldom operated but also stand repetitive starts.

Poland - Interconnection pipeline

- COMPRESSION UNITS
- OIL & LNG TANKERS
- OIL & LNG TERMINALS
- PIPELINES
- PIPE INTERCONNECTIONS

➤ Accurate information

BERNARD CONTROLS INTELLI+ is a turn-key solution which eases the commissioning, monitoring and maintenance of an installation. It allows access to key information through a user friendly and intuitive interface.

Moreover, the user can monitor precisely and continuously the status of his valves thanks to INTELLI+ smart features:

- **Absolute sensors** constantly measure the position & torque of the valve and **do not require any battery back up** to give the right values after loss of power supply,
- **Continuous performance** monitoring and up to 17 different types of faults and alarms,
- Signaling battery back-up (on option) allows to use the INTELLI+ display, update remote signaling and refresh fieldbus information in case of loss of power supply,

- **Partial stroking** to check the availability of a connected MOV which does not operate frequently...

If the user wants to get this information remotely, BERNARD CONTROLS offers fieldbus solutions designed for optimal communication with INTELLI+ actuators. Our Master Station is particularly advised for such application (see page 14).



BERNARD CONTROLS INTELLI+ digital interface



LNG Tanker, Norway
Isolation cryogenic valves



SOLUTIONS FOR process

Relying on decades of experience working on Oil & Gas projects, BERNARD CONTROLS has developed solutions for the most demanding applications, including all process applications – refining, recompression, liquefaction, regasification...



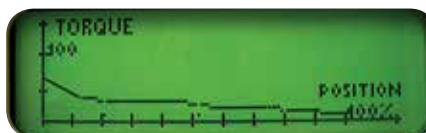
➤ Preventative maintenance

Because ensuring continuous operation is important to manage a smooth distribution flow, preventative maintenance is a key issue for site engineers.

BERNARD CONTROLS INTELLI+ helps the user with system diagnosis and aid in scheduling **valves preventative maintenance** by providing with a great deal of information:

- Actuator activity (number of starts, running time, handwheel action...),
- Self-monitoring (position & torque sensors, performance, motor...),
- Torque monitoring & valve torque curve...

INTELLI+ thus helps maximizing process availability by reducing process downtime.



On the other hand, for an easy site management, in case of fieldbus communication, BERNARD CONTROLS special Profibus connection board enables bus continuity if an actuator has to be removed from the field for maintenance or repair (see page 15).

- LIQUEFACTION
- PETROCHEMICAL PLANTS
- REFINERIES
- REGASIFICATION

➤ Fire protection



For enhanced security, BERNARD CONTROLS can propose as an option for explosion proof actuators, two efficient systems: a fire jacket or an intumescent coating. These two systems **allow the actuator to continue operating for 90 minutes in case of fire at a temperature exceeding 1000°C.**

Test of BERNARD CONTROLS' fire protection: After 30 minutes in fire temperature over 1000°C, the actuator's inside components are safe.

➤ Connection to Distributed Control System

As instrumentation items of the process, actuators are most of the time directly connected and driven by the DCS. BERNARD CONTROLS offers most of the reliable and secure communication features used in Oil & Gas process.

Of course BERNARD CONTROLS integrated intelligent controls INTELLI+ work in a traditional way, hardwired or 4-20 mA controlled, but also with open fieldbus technology such as **Modbus, Foundation Fieldbus or Profibus DPV1.**

Moreover, a special **ESD (Emergency Shut Down) signal** is also included as standard, for the Plant process management to ensure maximum level of security for some critical MOVs.



BERNARD CONTROLS fieldbus interface board



WORLDWIDE Services

BERNARD CONTROLS offers global solutions, including not only performing & reliable products, but also a complete range of services adapted to each project. International teams support customers all along the product lifetime – from design to start-up or maintenance, as well as for site revamping projects.



● BERNARD CONTROLS Group - ● Distributors & service centers
Contact details on www.bernardcontrols.com

Because Oil & Gas installations are spread across all continents, BERNARD CONTROLS Teams are at your service throughout the world, supplying spares or services throughout product lifetime.

> Design



BERNARD CONTROLS' engineers are available to help you determining the most suitable technology for each application. Thanks to a multidisciplinary team, our Design office develops solutions tailored to customers' needs.

> Commissioning



Commissioning electric actuators requires specific & careful expertise. This is especially true when the motorized valve is controlled by a complex system such as a fieldbus. That is the reason why our specialists are available to provide the adequate support to our customers for adaptation on valve, installation, set-up, start-up...



> Training



Regular training sessions are organized for our customers. These sessions are held either at our local service centers or at customer site. Actuators technology, setting, operating and maintenance are amongst

the most popular topics covered.

> Maintenance & repair



Every day, our technicians are available to quickly go on site for periodic actuator functional check-up, preventative maintenance operations, diagnostic and repair.

> Revamping & Project Management

BERNARD CONTROLS proposes **global solutions for revamping of installations**. Our engineers are used to working in project mode and can help you determining actuator's specifications (torque, actuator/valve interface...), as well as associated control solutions or complementary supplies and accessories (gearboxes, fieldbus equipment, IT supplies...).



ZOOM ON

BERNARD CONTROLS packaged solutions

BERNARD CONTROLS proposes packaged turn-key solutions for revamping or big projects.

These include manufacturing, installation and start-up of electric actuators.

But also, design and supply of global command & signaling systems, supply of automation items and/or electronic-IT material...



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