Italian Fire Extinguishing Technologies Meet the Challenge of International Oil & Gas Companies

A strong, customer–focused approach and the constant quest for top-class quality have enabled Sanco SpA to attain and sustain leadership in its major lines of business over the last 30 years

Nico Zorzetto
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At the heart of new drilling methods there is an easy equation: bigger capacity corresponds greater hazard. As high volumes of crude oil and/or gas reaching a single point becomes the norm, there is a noteworthy growth in the demand for infrastructures to safely handle the load. Each environment needs a different solution and approach to the project in order to provide high standards for human health, safety of properties and environment.

Sanco SpA has paid great attention to its capability to manage projects by providing detailed engineering and supplying fire fighting products in order to fulfill end users' requirements while respecting environment. The Company has been strengthening its global competitiveness through strategic cooperative efforts with the world's renowned construction companies and developers. In fact, Sanco has turned its vision towards the world by demonstrating its special capabilities and talent engineering while earning valuable experience with vital international projects.

In addition to the above services, Sanco has been providing also pre-commissioning, commissioning assistance including performance testing according to local characteristics in several locations all around the world (98 Countries).

Here under two cases of project: hot and cold.

Kuwait project: the "hot"challenge

Among the several Countries with really hot climates there is Kuwait, a Middle Eastern State with harsh environmental conditions: temperatures reach 55 °C with a relative humidity touching 100%.

One of the latest jobs performed by Sanco in this Country has been the protection for one of the most important and largest part of an oil refinery for the strategic growth plan in the international hydrocarbon sector. A wide range of fire fighting systems and equipment have been supplied there: from the fire & gas detection systems to the hydrant networks with water/foam monitors, water deluge systems and foam packages with pumping units, clean agent gaseous systems (IG541), as well as all fixed and mobile equipment (**figures 1, 2, 3, 4**).

A special case study has been carried out by Sanco for three different EPCs in order to identify the risks to be protected: basic design has been reviewed together with hydraulic calculations of all water/foam pipes as well as for gas systems and all connected downstream activities.

A complete range of knowledge has been needed to develop this type of projects: dealing not only with the contractual intricacies coming from the large variety of Institutions involved in the projects. Sanco expertise cover the management of project with contractors but even with end users, local communities and institutions. For this special purpose the whole project has been submitted to the local Fire Service Department (KFD), that has the duty to superintend and check that what has been designed is in accordance with the local fire authority standards.

Fig. 1 – Kuwait project: deluge valves on skid

Fig. 2 – Kuwait project: gaseous systems

Fig. 3 – Kuwait project: fire monitor on hydrant

Fig. 4 – Kuwait project: fire & gas detection panels (UL listed)

Fig. 5 - Uzbekistan project: foam bladder tanks with thermal insulation for very low temperature

Uzbekistan project: the "cold" challenge

Sanco has been performing several projects also in East Eurasia Countries, like Russia, Turkmenistan, Kazakhstan and Azerbaijan.

One of the many latest projects carried out in a really cold climate is Uzbekistan, with its extreme temperature fluctuations that reach -35 °C: deserts and semi deserts occupy 80% of the territory of this Republic and it causes a really wide-ranging temperature excursion that has to be faced with special measures.

This challenge, resulting from a contract with a Korean EPC, has involved the engineering and manufacturing of fire suppression systems meant to be suitable for very low temperatures: for this purpose, also we paid a special attention to the selection of material suitable for very low temperatures and relevant mechanical tests have been carried out in order to meet end users special requirements.

During the project a dedicated team of Uzbeki Fire Department has been visiting Sanco factory in order to evaluate our capability and the skills of our technical department (35 qualified engineers and qualified technicians). The inspection involved also two manufacturing lines: the electronic line for fire & gas detection systems and mechanical line for fire suppression systems, equipment and vehicles (**figures 5, 6**).

At the end of the audit special hydraulic tests have been carried out in order to check performances of systems part of the scope of supply, consisting of water deluge systems, foam packages, fire hydrants and monitors as well as safety showers and other fixed and mobile units. In this occasion, thermal insulation for water and foam systems has been essential, by means of a special isolation procedure and electrically trace heated systems and devices, thus keeping overall power consumption very low.

After the completion of installation in Uzbekistan, Sanco performed a dedicated training for local operators.

An additional challenge: training

For both the above mentioned projects, the EPCs have been asking for the training of personnel in charge for the operation and maintenance of the systems and equipment that have been supplied. For this reason, Sanco has provided assistance with two qualified technicians with decennial experience in the fire fighting field.

To prepare firefighters for actual fires, training officers

use purpose-made facilities to conduct live fire training, offering trainees the opportunity to develop their skills by learning appropriate behavior through repeated experiences.
In order to train firefighters, a fire training facility that is tailored to their risks is the best solution, complete with both theoretical training and practical course. For this purpose Sanco has designed and built fire training modules for a State oil Company in Algeria (**figures 7, 8, 9**).
The fire training ground was based not only on NFPA 1403 (Standard on Live Fire Training Evolutions) and other international norms, but also on the specifications of international oil & gas enterprises such as Shell and BP, not to mention the additional specific demands of the client.
Sanco adapted the training equipment for the use of LPG (Liquified Petroleum Gas) as the fuel for gaseous fires and with an option for flammable liquid fires. As LPG is more difficult to extinguish than gasoline the training outcome can be better.
To provide the fuel for all fire scenarios a dedicated LPG vessel from which some piping lines feed each fire training module. Each one can be independently controlled by the trainer at the fire control room by a command console inside it, that is able to ignite and stop the fire, as well as increase and decrease the fire's intensity in response to the fire suppression actions of the trainees.
A number of gas detectors installed throughout the fire training ground provide additional fire and gas detection information to a panel in the control room, enabling an automatic emergency shutdown and the flushing of trenches in case of any LPG leakage.
Several additional emergency push buttons have been installed throughout all the various scenarios, in order to immediately stop fires in the case of an emergency occurring during the fire extinguishing training. Low, medium or high-risk scenarios can be created thanks to nine burning modules managed from the control room like:

- torch fire (simulating a fire erupting from the end of a broken pipe cap);
- pool fire, 4 m^2 (simulating the rupture of a blind flange on a pipe, the leakage and ignition of fuel spilled from the flange and the fire from the flange);
- T-shaped cross pool (simulating a wide-area liquid fire);
- inclined plate (simulating fire from fuel that is dripping on an inclined plate);
- ruptured vessel surface fire;
- relief valve fire;
- loose flange fire;
- exploded pipe fire with pipe interception valve closure simulation;

Fig. 6 - Uzbekistan project: deluge valves for very low temperatures

Fig. 7 - Fire training ground LPG vessel

Fig. 8 - Control room for fire training ground

Fig. 9 - Training ground: night fire

- "Christmas tree" fire (simulating a large-volume fire in a complex system of cross pipes).

In addition to the aforementioned gas detection unit that is interfaced with the training ground system, Sanco also installed a flushing system for the LPG pipe trenches to prevent explosions caused by LPG leakages.

In addressing the major challenges we face, our goal requires to promote human safety and environmental protection. In fact when it comes to safety, progress can never be taken for granted, especially given the increasing complexity of operating environments. That is why we must make sure that safety is at the heart of our strategy, our activities and our values.

Honoring these important commitments is the foundation of our license to operate and one of our uppermost strategic priorities.

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Nico Zorzetto

Nico Zorzetto, Export & Marketing Director as well as shareholder of Sanco SpA, has been working in the fire fighting field for over 40 years. Even if he graduated in Economics, he has always been dedicating its interest to technological innovation for "reliable products".

He has been participating to the realization of several new products and systems; in particular he is co-creator of airbome fire fighting systems (fixed and rotating wing) for the fire fighting of forest fires. He has been publishing several articles – national and international - relevant to fire fighting subjects.

He operates also with national and International organizations for the Civil Protection Organizations, as well as with security matters, with jobs also with NATO.

iNDUSTRIAL PLANTS

May 2016

ITALIAN ENGINEERING, CONTRACTING AND PLANT COMPONENTS SUPPLIERS

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Special issue of "IMPIANTISTICA ITALIANA" Official magazine of ANIMP Italian Association of Industrial Plant Engineering

Spedizione in abbonamento postale - 45% - Art. 2 comma 20/B - Legge 662/96 - Milano