
*Loading procedures on heavy trailer for shipping*

# Fire Solutions at Extreme Environment Conditions

SANCO SpA has been asked to face a big challenge by one of the largest German EPC: a 7 million euro project for the protection of an ethylene cracker unit in Siberia, Russia. Stringent requirements and severe temperature conditions (-52 °C) have been a major test which SANCO has successfully overcome thanks to its long-term experience and by favoring the Italian supply chain, as a guarantee of superior quality and expertise.

**Nico Zorzetto**, *Export & Marketing Director, Sanco SpA*

After an important audit and through an international and competitive tender SANCO SpA has been assigned a 7 million euro project for the protection of an ethylene cracker unit in Siberia (Russia) by one of the largest German EPC. The supply has consisted of three main items:

- fire detection systems;
- high-pressure $CO_2$ systems skid-mounted (for indoor installation);
- groups of deluge valve skids in container (for outdoor installation).

Not an easy task since requirements on tender documents were very stringent and, particularly, it was important to take account of severe weather conditions such as a temperature of -47 °C during the coldest day with 98% coverage and an absolute minimum of -52 °C. Moreover, the design and manufacturing of systems were due to comply with following regulations, standards and Russian laws:

- NFPA regulations which apply to every single item in the contract. NFPA15: Standard for Water Spray Fixed Systems for Fire Protection;
- Federal Law No.123 FZ Technical Regulations on Fire Safety Requirements;
- SP 5.13130.2009 Fire Protection Systems, Automatic Fire Alarm and Fire Suppression Systems;
- SP 6.13130.2009 Code of Practice, Fire Protection Systems, Electrical Equipment, Fire Safety Requirements;
- NPB 88-2001 Fire Extinguishing and Fire Alarm Installations, Design Norms and Rules;
- GOST R 50680-94 Automatic Water Fire Extinguishing Systems, General Technical Requirements, Test Methods;
- GOST R 12.3.047-2012 Fire Safety of technological Processes;
- GOST R 51043-2002 Automatic water and foam fire fighting systems. Sprinkler, spray nozzles and water mist nozzles – General Technical requirement.

Thus, preliminary studies and manufacturing of systems were carried out by taking into consideration EAC certified equipment and instrumentation intended for very low temperatures, with particular regard to temperature-resistant steels.
In depth, the supply has comprised the following three items.

## Fire fighting detection systems

The system includes 4 GOST-R and EAC (EurAsian Certificates) certified control panels whose software and hardware is property of SANCO.

## High pressure $CO_2$ systems skid-mounted

Four buildings have been protected with $CO_2$ self-standing rack-mounted systems equipped with self-checking weighing devices. A piping distribution system and stainless steel fittings were individually tested at more than 200 bar. 1116 cylinders were also included in the systems which obviously comply with the aforementioned GOST / EAC regulations.

*Deluge valves special containers in factory*

## Deluge systems

These systems were made up of a series of manifolds on which more than 100 deluge valves are installed and they were located in special containers. These prefab units (some of which longer than 14 m and with an average weight of more than 23 tons) were built strictly in accordance with customer's specifications as follow:

- compact systems suitable for road and rail transport;
- suitability for the use at very low temperature and proper thermal insulation. In this regard, one of the requirements was: for winterization two electrical heaters, a thermostat, cable connected in a junction box shall be installed to maintain the temperature (also during the transportation) of the heated enclosure above 5 °C. Heaters to be equipped with alarming function for failure detection;
- weather-resistance, especially to roof snow load (240 kg/m$^2$);

*Deluge valve: typical container, interior layout*

*Containers view with opened safety doors*

- high-efficiency lighting (LED) in compliance with a specific Russian regulation;
- heating system c/w a double redundant control panel;
- instrumentation and equipment suitable for hazardous areas (1, gas group IIC, class T3);
- adequate spaces for an easy servicing in compliance with Russian Safety Rules, including a series of very close doors which can be opened or locked both from the inside and the outside (by means of a panic bar) for a quick getaway of the operators during emergencies. These doors have been equipped with status switches (open / close) as well as vocal and remote alarms.

All equipment was carefully chosen, by giving priority to national Companies' products which were deemed to meet project criteria, while bearing in mind important requirements such as:

- suitability for very low temperature (-52 °C);
- hazardous areas (Atex etc.);
- EAC certification;
- FAT and SAT double check;
- all internal and external connectors according to GOST and EAC certifications.

According to Russian standards, the ground distance of the supporting structure was a further aspect to consider for avoiding frozen ground effects. In addition, EAC certification was required even for prefab units and their content, for a total amount of 23 containers hosting more than 100 low-temperature carbon steel deluge valves with stainless steel trim.

Also the transport service required special conditions so as to ensure the proper storage of the equipment inside containers. For this reason, each prefab unit was fitted with a couple of electric generators (one working and one on stand-by status) intended to keep containers at constant temperature all the way up to site. And finally, all delivery terms were fulfilled and no deviation from contract specifications was observed.

This project was indeed a major challenge that SANCO has tackled - being one of main actors in the firefighting sector at both national and European level - with its long-term experience, while mostly favoring the Italian supply chain as a guarantee of superior quality and expertise. An Italian know-how that SANCO exports to 100 plus world markets every year, and that accounts for approximately 90% of its production.

## Nico Zorzetto

Nico Zorzetto, Export & Marketing Director as well as shareholder of Sanco SpA., has been working in the fire fighting field for the last 43 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 airmobile fire fighting systems (fixed type and rotating wing) for the fire fighting of bushfires. 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.