

Tank Burner Safety

A new system to control and operate tank burner systems has been developed which will provide operating companies with the means to improve tank burner safety, reduce emissions, and to comply with regulations at an affordable price.

Over the last few years there has been an impasse regarding the oil industry's acceptance and compliance to gas appliance regulations. While a conventional tank burner system is not as safe as it could be and does not address some of the regulations in the Canadian gas code, complete compliance with the code is arguably overkill and prohibitively expensive. A tank located in the bush in Northeastern Alberta simply does not require the same shut-downs and controls as a gas appliance in someone's home.

However, both regulators and oil companies agree that any reasonable step to protect workers must be taken.

To resolve the issue A-Fire Holdings and Noralta Controls met with the Chief Gas Inspectors from Alberta and Saskatchewan to discuss tank burners. It soon became clear that there are three main safety issues with tank burner systems...

1. Lighting the burner

In a conventional system the operator has to open the flame arrestor to insert a torch to light the pilot. This means that the operator must disable the specific safety device meant to protect him when he lights the tank burner. Almost all incidents and injuries related to tank burners occur during the lighting process.

2. Flame failure shutdown

If the fire goes out in the burner there is no flame failure shut down. In these cases the fuel gas continues to blow through the controls, the burner, and up the stack. This causes a safety concern, a waste of expensive fuel, and an emissions issue.

3. Low tank fluid level shutdown

If the fluid level in the tank, through an equipment failure or human error, falls below the firetube the heat exchange will fail and the firetube will overheat. This often will result in an explosion of the flammable vapors in the tank head space.

A-Fire and Noralta developed a burner control system that addresses these three issues.

1. The system has an electronic ignition. The operator pushes a button on the control panel which initiates the ignition process. The system does a purge test to insure there is no fuel in the firetube, starts the ignition process, and opens the fuel to the pilot. Once ignition is established and confirmed the operator can turn on the main burner. Flame status can be monitored and can be reported via SCADA to a control room.
2. If the fire goes out the system will close the gas control valve. In this event, the system can be programmed to perform a relight sequence, to send an alarm via SCADA, or to stay down until an operator intervenes.
3. If the fluid level in the tank falls to the predetermined critical distance above the firetube the system will shut down until the fluid level recovers. Once the fluid level recovers the system will relight automatically.

The system, which operates on 12V DC power from the well driver, has been approved by the Alberta and Saskatchewan Gas Safety Services, and costs a fraction of the price of any other compliant system.

The presentation will describe the situation regarding industry gas safety compliance in Alberta and Saskatchewan. There will be some discussion on the background and development of the new burner management system as well as the operating principles.