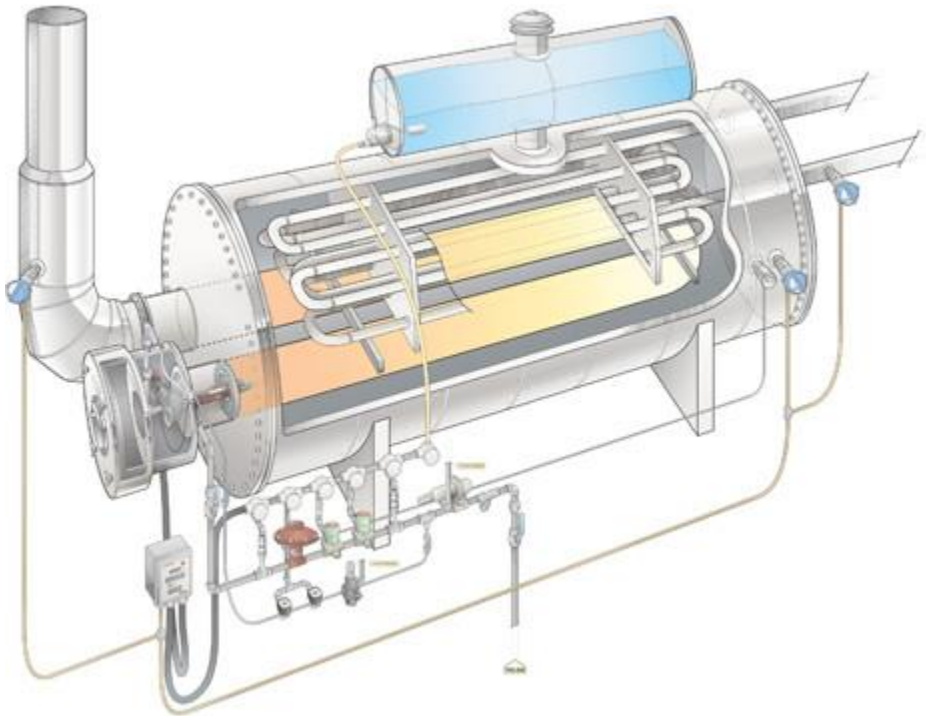
How a BMS Improves Operational Safety?



Chances are that the traditional way you heat industrial fluids is not safe. At least that is what the statistics indicate. Safety related incidents have plagued chemical processing and oil & gas industries since their inception. They lead to injuries, loss of lives, loss of property, equipment damage and loss in production. It is also bad publicity. These days the media, public and environmental groups have joined hands to convince governments to make health, safety and environment protection a priority. One way to drastically improve your safety record would be to upgrade your traditional industrial heaters so that they operate using a BMS (Burner Management System).

A BMS controlled process heater has safety limits built into it. These include automatic activation of emergency fuel supply shut-off using isolation valves. The system automatically alerts the operators via alarms. It can be tripped in various scenarios including: low process heater liquid level, low liquid / vapor flow in heater; heater fluid temperature exceeding high temperature limit; high pressure in vaporizing process heater; low fuel gas pressure supply to process heater, etc.

In addition to these safety limits, BMS-controlled heaters implement safety interlocks ensuring: measuring high flue gas temperature redundantly at the stack; measuring high fluid outlet temperature redundantly as close as possible to exit of heating chamber; activating the heater's fire suppression system, etc.

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BMS are typically installed with a fuel valve train for the pilot and burners. Among the safety features in the valve train are emergency shut-off valves, fuel isolation valves, overpressure protection devices, venting apparatus, pressure switches, etc. They are installed in various configurations that are optimally chosen with safety in mind considering the size of the process heater and its power requirements.

BMS-controlled process heaters are served by pilots and burners which can be automatically re-ignited if the flame goes out. The flame is automatically supervised by ion rods or UV/IR detectors. Once the system registers that the fire is out, it attempts re-ignition in a limited time period, releasing fuel into the combustion chamber. In case, the ignition fails, the system automatically goes into the purge mode, stopping the fuel supply and instead filling the chamber with air. This ensures that there is no fuel build up and prevents incidents due to explosions. The system goes into safety interlocks if the replaced air falls below minimum or exceeds maximum. After the purge is complete, the fuel is released again and ignition is re-attempted only in the presence of fuel gas.

The process heater BMS are based on programmer controllers which monitor, sequence and control all aspects of the burner and combustion process. It is designed so that no singular point of failure results in an uncontrollable condition, rendering the system inoperative in the event of any hazardous situation. The BMS microprocessor is solely dedicated to the BMS. No other logic is part of its I/O, memory or software eliminating the possibility of the system inadvertently following alternative control logic. Its controller software is stored in non-erasable memory so that it does not easily get modified or erased at power loss. A watchdog timer is built-in to the BMS processors. Whenever one of the processors are held up due to an unforeseen condition, the watchdog timer indicates the problem and the system goes into a safe operation mode, shutting fuel supply and associated valves. The BMS controller typically have redundant microprocessors which do the same operations in a synchronized manner. At each step, they compare their operations. If there is any discrepancy they alert the system and put it into a safe state.

BMS are typically are designed and manufactured based on safety standards. Some of these standards relate to the minimizing the possibility of unsafe ignition in a hazardous location, reducing the list of explosions and fires; safeguarding against faulty controller logic; using high quality electronic components set up in a redundant manner, so that even if two fail, the system keeps running; etc.

By upgrading to a BMS-controlled heater, you will have peace of mind that you have minimized the safety risks and are meeting your industry's regulations. This can help your operations to be better certified for safety and efficiency by independent safety certification bodies.

Profire Energy offers safety certified PF2100 and PF3100 family of BMS solutions. To learn more about our products, solutions and services visit www.profireenergy.com .

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