

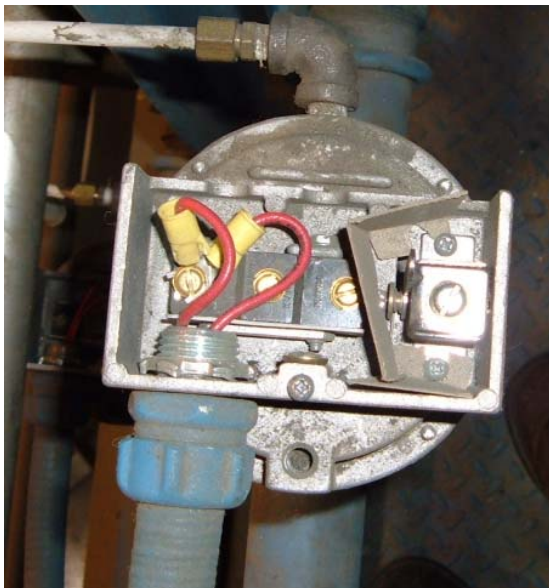
## **Safety is not an accident**

As a consulting company for the heat-treat industry. A large part of our business is combustion hazard assessment and combustion safety checks on gas fired equipment. Being involved in the industry since 1991, we have had the opportunity to observe first hand, safety and control issues that plague the industry. As a consultant we have investigated incidences of two explosions and one fire.

The National Fire Protection Association (NFPA) and the Occupational Safety & Health Administration (OSHA) are just two of the agencies that have several logical and well-written safety codes that manufacturers of the equipment are supposed to follow. These are just the basic codes they must follow to produce a safe product. We have found that there is a growing problem with building a machine per code, and then being able to maintain that machine per code.

Almost every company in the country has safety programs and policies set in place to protect their workers. Not many people want to sign up for a one death and three accidents per year job. This is why we need 100% safe equipment and work practices. A major company in the aluminum industry has a policy that says they would rather be safe then make their product. With a policy like that, the question is; why do we have work related accidents?

In one instance, I found two gas pressure switches were terminated with both wires put together. The switch had been tripping for an unknown reason and shutting off the oven. Instead of investigating and fixing the problem, it was decided they would just bypass the two switches. This in turn cancelled out the important job of the gas pressure switch, and gas was left to flow at any pressure sent down the line. This is certain disregard for the safety of personnel that must work around a ticking time bomb. The switches would never been found if it wasn't for our safety check.



Picture #1 shows the two wires being terminated on the same terminal.

During an inspection of a large drop bottom oven, we discovered the hoist cables in extreme danger of breaking. The problem was reported to shop management and safety personnel. The initial decision by the shop management was to run the machine an additional three days, and replace the cables on the weekend. This was completely unacceptable by the company's internal standards, and the upper management had the machine shut down and repaired. The result of a possible accident will bring production to a stand still for quite some time. Not to mention the possible injuries or loss of life during the accident and to the maintenance personnel sent to fix the problem.



Picture show cable in the hoist.



Cable removed from the machine

A new methanol refinery plant was safety inspected and it was found that the main gas train did not have the NFPA 54 required safety shutoff safety valves. In addition the regulated main gas pressure exceeded the ratings of the gas valves located at the ovens and thermal oxidizers. New pilot gas trains did not meet NFPA 86 requirements for the pilots BTU input. Double shutoff valves and proof of closure switch was not used.

Another large company identified several safety problems on a machine. The replacement parts were ordered and when they came in they ended up being set aside for more than two years.

There are in my opinion five (5) main areas that need attention to avoid accidents:

- 1) Design engineers must understand how the machines are going to be used in the production environment. They need to design the equipment with maintenance and safety checks in mind.
- 2) Codes and regulations must be understood and implemented, especially on safety items. Safety checks must be possible.
- 3) Training of maintenance and operators in preventative maintenance to the extent that they can recognize a dangerous situation.
- 4) Production must understand the fact that a machine cannot run 24/7 without maintenance.
- 5) Maintenance takes time and money. Compared to accidents and unscheduled breakdowns, it is money well spent.

Inexperienced management, production requirements, the shortage of well trained manpower, and the lack of understanding the machine and its dangers are only part of the blame. Maintenance is being cut back to a stage where machines are barely able to stay in production. In addition many maintenance functions are off-loaded to outside vendors which are working **un**-supervised or without checks on machines that has very real potentials for creating major incidents in the plants. NFPA, OSHA and any other codes that are supposed to be followed are not being followed in whole by equipment manufacturer and users. Either due to lack of understanding or due to perceived economic reasons.

Accidents can be prevented, however all disciplines must be well oiled and aligned to ensure smooth operation. The machine must be designed for use. The controls must support the use of the machine in the intended fashion and the operators must be well trained and alert to subtle changes that can make the machine dangerous to work on or with.

Bogh Industries is able to perform both initial safety evaluations and checks plus provide solutions for solving most issues in regards to oven and furnace equipment.

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