

# Don't Get Burned by a Retrofit Project

## Safety Note

Obtaining a new burner or controls for your boiler, furnace or oven seems a simple enough task. A vendor has these items to sell, they provide a price, and do the work and then everything is set and ready to go, right?

Wrong! Unless careful planning is conducted and all involved are communicating vigilantly, trouble can arise. All too often, we are hired to perform the role of arbitrator, mediator or neutral third-party expert for projects that have gone wrong. The end result can range from damaged equipment that is out of service for months to lengthy lawsuits. What is worse is the waste of time and money on the part of the equipment owner.

Below are some of the issues and suggestions on resolving them.

### Project Scoping and Responsibilities

Few OEMs make their own burners and control systems. Therefore, calling them back in often brings little peace of mind for a correct and functioning project. Retrofits are a different animal. You are asking someone to try to fix, in some cases, years of neglect and a history of various operators and maintenance technicians making changes to a piece of equipment that have often gone undocumented.

For example, in the case of a boiler that is getting a new low NOx burner, there are several issues that can cause disappointment. Sometimes conditions inside the boiler may have changed over the years, such as the spacing of tubes between passes that can leak CO gas to the flue. This is not the fault of the burner, but it would most likely be discovered in the burner commissioning process. So, whose fault is this? How do you as a customer feel when you are told the burner does not meet performance expectations but it is not the burner vendor's fault?

What about a furnace or oven where the contractor starts to tear into that "snake pit" of a junction box and finds out things are not as they seemed? What happens now?

No retrofit project should commence without a formal meeting to discuss all of the problems that could crop up, as well as all of the possible contingencies.



Obtaining a new burner or controls for your boiler, furnace or oven seems a simple enough task - however, all too often, the end result can range from damaged equipment to lengthy lawsuits. Retrofitting fuel trains, controls, and burners is not a simple or straightforward process.

## Safety Devices and Close Outs

Changing anything related to the piping of a fuel train could trigger certain automatic events. For example, any time a fuel train is opened up, the tightness of all automatic valves in a system should be checked prior to putting the device back into service. They should be checked again within two weeks, and then again after three months. Opening up any fuel train creates the risk of passing contamination down into valve sealing areas.



The other issue is properly closing out a retrofit. Every retrofit project should include a contractor verifying the functionality of all safety devices in every possible failure mode, and the verification of the correct set-points and calibration of all control and safety devices, whether they were part of the project or not. This should also be followed by a complete combustion fuel/air ratio setting and verification. This level of detail should be built into the original pricing and project scope.

It is also important to understand that testing and calibration can mean the discovery of problems. You cannot ask a contractor to be responsible for the cost of replacing failed components, deriving switch set-points that were never correct, the replacement of devices or the discovery of issues that may have been a problem for years. You need to have confidence in whomever you are using and make sure that you have a source for a second opinion.

It also makes sense to ensure that whomever you are using is able to provide you with an analysis of how your current equipment and safety systems match up with current safety codes.

This includes NFPA 85 for boilers and NFPA 86 for ovens and furnaces (available at [www.nfpa.org](http://www.nfpa.org)). It may be illegal to do a partial retrofit in some states and not make a piece of equipment totally compliant with the latest code version.



Please keep in mind that any time a piece of equipment's flame safety or control logic is modified, you should involve your insurance provider. This is usually your property and casualty (fire) insurance company for ovens and furnaces, and/or fuel train or burner changes on boilers. In most cases, they will want to review what you are doing; including approving drawings. You need to build approximately one month into your project schedule for these reviews

Retrofitting fuel trains, controls, and burners is not a simple or straightforward process. When someone says they are upgrading controls, there are two systems to which they could be referring. Every piece of fuel-fired equipment has two control systems: the CCS (sometimes called the Combustion Control System) and the BMS (Burner Management System or safety controls). These are usually two separate and distinct systems. Make sure everyone's talking about the same thing.

It is important to ensure that everyone enters into projects with eyes wide-open, communicates effectively, budgets appropriately, involves insurance representatives in reviews, and incorporates a rigorous and well-defined close-out process. Not being prepared significantly increases the risks.

## ABOUT US

---

Honeywell Combustion Safety is a part of Honeywell Thermal Solutions, an industry leader in commercial and industrial combustion solutions. Honeywell Combustion Safety, formerly known as CEC Combustion Safety, has been in business since 1984. With engineers and staff members that sit on Code committees such as NFPA 56, NFPA 85, NFPA 86, and NFPA 87, our inside expertise is integrated within all of our practices, and our global reach ensures that customers around the world are kept safe. Honeywell offers testing and inspections, engineering & upgrades/retrofits, gas hazards management, training, and field services for all industrial facilities and different types of fuel fired equipment. By assisting organizations and their personnel with the safe maintenance and operation of their combustion equipment, Honeywell aims to save lives and prevent explosions while increasing efficiency and reliability of combustion equipment.

### **For more information**

Learn more about Honeywell Combustion Safety, contact [info@combustionsafety.com](mailto:info@combustionsafety.com), visit [www.combustionsafety.com](http://www.combustionsafety.com) or contact your Honeywell Sales Engineer.

### **Honeywell Process Solutions**

Honeywell Combustion Safety  
2100 Apollo Drive  
Brook Park, OH 44142 USA  
Tel: +1 216-749-2992

SF-17-11-US  
November 2017  
© 2017 Honeywell International Inc.

**Honeywell**