

“In Praise of Training”
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Not long ago, we participated in an industrial steam training program. The class, conducted by Industrial Interactions [<http://www.industrialinteractions.com>], discussed industrial boiler operations and safety. Operators representing a labeling plant, a greenhouse, and an office heating plant were also enrolled in the class. Each attendee came to learn something different. Most came to find ways to improve the operations of their respective plants to save money in today’s slow economy. We came to get a better understanding of how industrial boilers function while also getting to know the training needs of practitioners. We all came away learning lessons we hadn’t expected.

Our instructor, a self-proclaimed “boiler Q-tip,” had a great deal of knowledge and, perhaps more importantly, practical experience to share with us. The topics we covered included the function of boilers and their various components, characterizing and accounting for system losses, and boiler safety and codes compliance. Along with technical instruction on boilers, our instructor shared many stories and pictures of hard-won lessons in boiler function and malfunction. Since most of the attendees were operators, the class taught primarily hands-on, usable theory supplemented with some technical information and formulas. Attendees were also given a few methods for quantifying system losses in dollar figures. Dollar impacts are the key to demonstrating project effectiveness to management.

In the end, operators did learn ways to improve the performance of their steam system and reduce the cost of raising steam. But some were merely looking for technical information about how to fix a specific problem. In some such cases we learned that this intended solution might fix the problem at the end point but fail to fix it at the source. Some potential fixes turned out to be altogether bad ideas. For example, a fuel-switching project idea was scrapped immediately when our instructor pointed out the infrastructure and emissions changes that such a project would involve.

Some of the most surprising lessons learned were the result of discussions on safety. Safety codes existed that many students knew nothing about before the training course. As a result, almost everyone in the class was anxious to make some serious changes back at their plant to avoid fines and, more importantly, to avoid harm to those working in the plant.

But for every hard lesson and corrected misconception, students were exposed to projects and solutions in areas they had not previously considered. Instead of looking for savings through infrastructure changes, many operators will save money through simple changes in procedure and maintenance. The operator who was considering fuel switching won't be able to save money using residual (No. 6) fuel oil, but found ways to save money through improved boiler efficiency, decreased blow down, and improved safety and codes compliance (which can translate to lower insurance premiums and fewer safety violation fines). An understanding of the steam system through training will also allow these operators to anticipate problems instead of waiting for them to occur.

In the end one, of the most important lessons we learned was the value of training. The workplace is not only an environment but also a culture. Without proper guidance the workplace can become a culture of bad habits. When employees lack an understanding of all aspects of the steam system, they cannot see the impact their actions have on the system. Under pressure to meet production goals, employees may use a quick-fix to address a serious problem, not understanding the implications of such an action. Without correction, these quick fixes can become standard operating procedure. Our instructor shared with us countless experiences where, for example, a broomstick was used to permanently override a lock-out safety device, or a safety mechanism had been totally removed because "the alarm kept going off." If these quick fixes go uncorrected (and are perhaps even supported) incoming operators will be trained to perform similar tasks that may undermine the built-in protection the system provides. In the end, a boiler start-up procedure could grow to include the methodical bypass of every lock-out safety device connected to the system.

Whether they realize it or not, operators at industrial plants will receive some sort of "training" during their career. This training can be through a formal program, through mentoring by more experienced operators, or through the so-called "school of hard knocks." For an operator to know how to maintain a steam system and how to address failures and malfunctions effectively, a plant must be sure of the quality and method of training. An *ad hoc*, improvised training program will result in *ad hoc* results. The value of planned and proactive training is found in the creation of competent, effective, and proactive plant operators.

For help in locating training programs in your area, try consulting the National Inventory of Manufacturing Assistance Programs (NIMAP) located online on at <http://www.oit.doe.gov/bestpractices/nimap/>. Created by the Alliance to Save Energy for the U.S. Department of Energy (DOE) Office of Industrial Technology, the database is searchable by state, region, territory, or keyword and lists over 70 training programs available on a low-cost or no-cost basis. Additionally, a calendar of DOE and private sector training events is housed on the Steaming Ahead website at <http://www.ase.org/steamingahead/calendars/>.