

THE

US

# Boiler Report



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## SOCIAL MEDIA #WINNING



If you've been following this newsletter for any length of time, you might recall a series of articles that our own Alexis Gessner, of the U.S. Boiler Marketing Department had written that involved the burgeoning social media revolution and how it can work for you. One of the main focal points in these articles was the fact that social media resources, like Facebook, Twitter, and the like can be a valuable communications tool, especially when it comes to making people aware of what you're doing in your market.

To be sure, we believe in practicing what we preach.

One of the barometers of how your social media messages are being received are the "page likes" that are generated in Facebook. These are generated when the reader simply clicks on the "like" button that accompanies your Facebook post. For the creator of the post, it's a simple way to know that your message is being read, understood, and "liked" by your audience. Obviously, if you get a lot of these, it means that your message is getting through.

Apparently, our messages are doing just that. In fact, it's at the point that U.S. Boiler leads the field of boiler

manufacturers in this important category. Overall, our Facebook outreach is roughly 8,000 contacts...all who have signed on to be in the know of what we're doing.

We are a company that is devoted to the concept of "US begins with YOU". If we can also show that you can use the same kind of tools to market your company, it becomes a winning proposition all the way around. If you have any questions on how to get started, we can help! Simply email Alexis: [webadmin@usboiler.net](mailto:webadmin@usboiler.net)



### What's Inside...

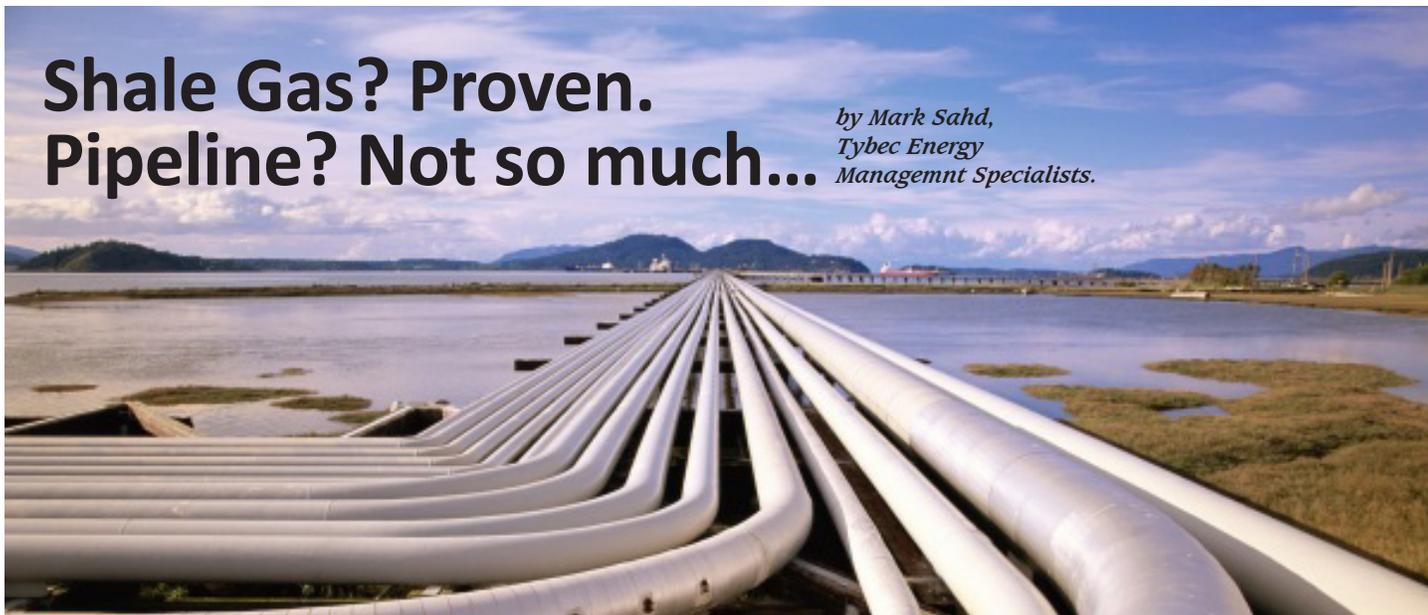
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# Shale Gas? Proven. Pipeline? Not so much...

by Mark Sahd,  
Tybec Energy  
Management Specialists.



Among the many things that last year's harsh and extended "polar vortex" winter did to the nation, it's shown us the strengths and weaknesses of our domestic natural gas supply and infrastructure. While gas prices spiked briefly (NYMEX broke \$5.50 in January) the weather's recoil wasn't felt nearly as sharply as it would have been in absence of the shale plays.

The wicked winter was the first event that's actually tested the new market factors of Marcellus gas. As expected, shale gas significantly dampened the volatility that could've resulted. While the demand for gas increased dramatically over the winter, the price at the wellhead only increased by \$1.50. The main cost-to-consumer price hike can be attributed to transportation of the fuel.

## The perfect storm

Natural gas prices at the meter rose sharply despite the fact that ample natural gas stores were available all winter. Increases were due in large part to constrictive, underdeveloped pipelines; there simply wasn't a way to get gas to where it was needed as fast as it was being consumed. We've learned that when the country

is burning gas at full speed, the infrastructure can't keep up.

Compounding the affects brought on by the harsh weather were two factors that were under-calculated for. In 2014, the increased demand due to staggering number of residential oil-to-gas heating conversions throughout the Northeast showed its impact. Utilities have record of how many conversions took place over the past year, but didn't know exactly how much extra gas will be consumed.

Electric generation had an even larger effect. Going into the 2013/2014 winter, there was more baseload electric being produced by natural gas than during any winter in history. But this was also the first winter in a long time that peak-shaving plants also needed to come online, which typically only happens in the summer to meet AC demand.

## A robust source

What's impressive, and speaks volumes about the effectiveness of the shale gas sources, is that even in face of so many bullish market factors, gas prices *only* rose to the \$5.00-\$6.00 range on the national average.

Without Marcellus gas, the price spikes would have been much higher, nearing

twice as severe. But the bigger issue is that prices would have remained high for much longer. For the remainder of 2014, expect slightly above average summer gas prices as storage refills.

The big picture is that from an energy standpoint, we're sitting in a better position than any time in the past decade. That said, the past winter revealed some real weaknesses. Luckily, the solution is already in the works. Let's hope the pipelines catch up before the next high demand event.



**Mark Sahd is COO of Lititz, PA-based Tybec Energy Management Specialists, Inc. Sahd, has more than 22 years experience in the energy industry, including time as industrial and commercial sales manager for UGI Energy Services, Inc. Serving the entire mid-Atlantic region, Tybec Energy is an independent energy solutions company that helps industrial and commercial companies keep energy costs under control. He can be reached at [msahd@tybecenergy.com](mailto:msahd@tybecenergy.com)**



# “YES, I can”

I travel a lot, and keep my expectations low when it comes to customer service. So, I am delighted when someone gets it right! Let me tell you about an extraordinary service experience. It was a simple interaction, but the good feelings it inspired stuck with me for days.

**I was staying at a run-of-the-mill hotel. Overall, the facilities were just so-so. It was the people who made me pay attention, and one person in particular.**

I requested a ride to the airport when I was checking out. A valet appeared and loaded my suitcases into the hotel van. He introduced himself as Michael, and helped me load myself into the van. Off we went.

I noticed a little pin on his jacket. It said, in script, “*Yes, I Can.*” I love that expression. I asked Michael about the pin.

His chest swelled as he answered, “This pin means that I can handle any problem concerning any guest at our hotel. I can do whatever it takes to solve their problem. So, no matter what happens, I can make it all better.”

“That’s pretty cool,” I replied. “Does everyone at your hotel have that degree

of authority and responsibility?”

“No, you have to go through the ‘Yes, I Can’ class,” he explained. “It’s a three-day course they put on at the hotel. We practiced ways to solve problems, and what we would do to help guests in different situations. It was actually a lot of fun.”

“Suppose I was unhappy with my room?” I prompted.

“I’d switch rooms for you, if that would help. I could even give you a full refund on your room, if it that’s what it would take to make you feel better,” he responded without missing a beat.

“Very good! Michael, tell me about a recent experience you’ve had putting your ‘Yes, I Can’ abilities to the test,” I asked.

“I haven’t had the opportunity, yet,” Michael said simply. “I just graduated from the course last week. We do a good job around here, so there aren’t many complaints. But if something comes up, I can take care of it. Yes, I can!”

**I was struck by his enthusiasm. I told him that he appeared to be pretty pleased with his career.**

“I really like it here. I try to do a good job.” Then, he added proudly, “Last month, I was the Employee of the

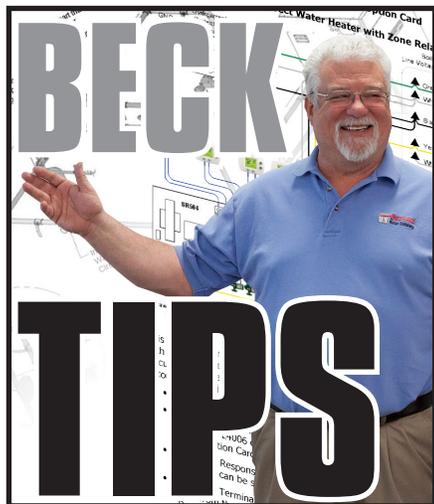
Month. That means I am in the running for Employee of the Year. If I win, I’ll take my son with me on a cruise.” He had it all worked out already.

We arrived at the airport, and Michael hoisted my bags over to the Sky Cap. We shook hands and parted ways. I was left considering how easy it really is to make people feel good about their jobs: Teach them what to do, how to do it and why. Then, let them do it.

## The Point of Training

You can translate this experience to your PHC company, can’t you? What if you empowered every team member to make your customers happy? What if you committed to their training? As an owner or manager of your small shop, what could be more important than helping people get better...not just at the job, but at life? Can you afford to make that kind of commitment? Yes you can.

*A business plan can get you all on the same page! Less stress and drama, MORE MONEY! Download Ellen’s free Biz Planning Video Series at: [www.BareBonesBiz.com](http://www.BareBonesBiz.com) You can also find “ellenrohr” on Facebook, Twitter and Google+.*



By Ron Beck,  
U.S. Boiler Company

Outdoor reset (ODR) is available for any hot water boiler installation today as an add-on control or as a plug & play card. US Boiler's Optional Control Panel (OCP) on cast iron gas water boiler models ES2, Series 3, ESC and



MPO-1Q oil boiler offer this easy feature. Your greatest fuel savings is a properly sized boiler. If you have not read "Is That Boiler

Properly Sized?" from the May 2013 issue of the *US Boiler Report* which explains the benefits of properly sized boilers you can do so here <http://usboiler.net/library/USBoilerReport/usboilerreportmay2013/index.html>

Adding an ODR control could save on average an additional 10% – 20% of your fuel bill. The variables for fuel savings are the type and amount of radiation and adjustment of the ODR curve parameters.



The ODR plug-in card not only has setup parameters for the ODR but also has added control for domestic hot water (DHW). Let's look

at the parameters, and then discuss ODR in greater detail.

### Domestic How Water (DHW)

**Setpoint** – Temperature of the boiler water going to an indirect water heater in order to bring it to the desired tank temperature setpoint.

# The Outdoor Reset Card Part 1 of 2

**Priority time** – Prioritizes the DHW and stops heating circulator for the desired time period entered. If time period is left at the default of "0" minutes there will be no DHW priority.

**Thermostat Setback Setpoint** – Lowers the boiler water temperature to recover the water heater automatically when the home thermostat is a Honeywell w/Envirocom communication and is in the away or sleep mode. The recovery of the tank is slower but during non-use times the lower temperature boiler water will save fuel.

**Boost Time** - The Boost Time parameter is used to increase the operating setpoint when the home heat demand is not satisfied after the Boost Time setting is exceeded. Every time the thermostat is not satisfied before the boost time expires, the heating system water temperature will increase by 10°F. This can continue until the high limit is reached. The use of zone valves and multi-zone relays can cause this feature to override ODR often during colder weather due to overlapping heat demands.

**Low OD Air Temperature** – This is normally set to the OD design air temperature for your area. This is the temperature used doing heat loss calculations to determine boiler sizes. Do not use inflated temperatures. This may cause insufficient home heating. If your OD design temperature is 11°F do not use 5°F. You get your hottest system water at the Low Outdoor Temperature so if your system was designed at 14°F and your control is set to 5°F, your boiler water temperature will not be at max temperature until the weather gets colder than design. The OD design temperature can be found online or in ASHRAE manuals.

**High OD Air Temperature** – This is the temperature you desire to supply the coolest water temperature to the

building. This is usually set to building thermostat settings.

**Low Boiler Water Temperature** – This would be adjusted to supply the lowest water temperature required to heat the building. This setting helps set the heating curve and many times is set to the thermostat setting or slightly higher.

**High Boiler Water Temperature** – AKA high limit setting. This is the highest water temperature the boiler will send to the building at OD design temperature.

**Minimum Water Temperature** – This will set a minimum supply water temperature for the ODR setpoint. This is normally set to avoid condensation temperatures in the chimney and boiler.

All of these parameters have default settings that will work out of the box. You can change parameter settings to maximize customer savings offered by the ODR. The idea is to get close to constant circulator run times for maximum fuel savings and comfort. The cooler the system runs the more fuel dollars you save.

**Coming Next Month** – We'll talk about how you can optimize ODR in your installations.

*Ron Beck is Outside Technical Advisor and Manager of Training for U.S. Boiler Company, where he's been since 1998. Ron's 34 years of experience in the heating industry include climbing the ranks of a HVAC company, from apprentice to service manager. Currently, he's the de-facto, go-to solution guy for contractors in the field.*

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# An Eight-Stage Oil System? System? Oh Yes They Did!



Glenn Stanton, manager of training and technical development for US Boiler (left) and Matt Plante, equipment specialist for Petro, stand in the finished mechanical room.



Earth is round, water flows downhill, and oil-fired systems don't modulate. Ok, so there are a few rare exceptions to the last one. *Sort of.*

A unique, staged-fire, oil installation recently proved its worth at the Brothers of the Sacred Heart Provincial Community, in Pascoag, Rhode Island. It's a retirement community for Catholic School clergy, but is often referred to as a monastery.

In rural corners of Rhode Island, natural gas lines are still a pipe dream. But the solution that the monastery found – with a fuel savings of more than 35 percent - leaves them at no disadvantage compared to the folks in the city.

As the 50,000 square-foot facility's two, 59-year-old boilers became needier for maintenance attention every year, the monastery's number of live-in clergy has also dwindled. Rooms that were previously conditioned are now turned down for most of the heating season.

What the parish needed was an oil system that could provide enough energy to heat the entire structure for special events, but yet coast along at low-load without short cycling. Petro Home Heating & Air Conditioning has supplied oil and serviced the monastery's system for years, so when it came time for a retrofit, the company already knew exactly what was needed.

## Smaller packages

"We proposed to pull out the two, 1 million BTU boilers, and install eight, 230 MBH Burnham MPO-IQ boilers, linking them all together with a tekmar multi-stage boiler control system," said Matt Plante, equipment specialist for Petro. "We've exchanged big boilers for numerous small oil boilers in apartment buildings before, but never at this scale."

A mix of radiation is used throughout the building, including both residential and commercial fin-tube radiators, hydro-air coils, and cast-iron radiators. Three-way valves and constant-pressure pumping keep the distribution system relatively simple.

"A challenge going into this project was simply convincing facility managers that they could maintain the same level of comfort, with less fuel expended, using *smaller* boilers," continued Plante. "I guess if you don't know any better, and you're used to looking at two large commercial units, an MPO-IQ looks pretty tiny in comparison. But, when they heard how much they could save in heating costs, their reservations disappeared."

Unlike the old boilers, the MPO-IQ is a three-pass, cast-iron sectional boiler. It's 87 percent efficient, and offers an onboard control system the likes of which is typically

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—“Sacred Heart”, continued

reserved for boilers in a higher price bracket.

## Divine design

“Glenn Stanton, manager of training and technical development for US Boiler, was absolutely instrumental to the success of the entire job.” Plante continued.

“He produced the venting and piping diagrams, and calculated the flow rates. He was there every step of the way.”

Luckily for Stanton and the Petro team, the mechanical room was perfect for their installation; plenty of floor space and high ceilings. Best of all, there was a set of double doors leading straight out to the parking lot.

And straight out the old boilers went. The MPO-IQs were set right in place with a fork lift as soon as they were delivered by The Portland Group, in Providence. The entire mechanical room was re-piped to accommodate the change. For ease of service, ample space was left between the boilers when they were placed in rows.

A tekmar Boiler Control 268 regulates a single water temperature through outdoor temperature reset, as well as staging and rotating the eight boilers to properly match the building heating demand.

Taco circulators on each boiler add its heat input to one of the two, three-inch boiler loops, which tee into a common four-inch supply

via primary/secondary piping. This common supply line is served by a Taco 4900 air and dirt separator. Stub-outs were installed for the possibility adding DHW to the boiler system in the future.

Each row of four boilers is served by a 14-inch common exhaust vent, which leads to the building’s existing chimney.

## A plan comes together

“It’s impressive how smoothly and quickly it came together,” said Plante. “The boilers were fired about six weeks after they were ordered. Demolition, wiring, venting, piping, control setup; it all went off without a single glitch.”

Because of the job’s uniqueness – from the multiple oil boiler approach to the varying types of heat distribution – its success was a team effort. Bruce Crawford, equipment and installation manager for Petro, and Dave O’Driscoll, Petro’s installation field supervisor, put many hours into planning and coordinating every facet of the project.

Both Stanton and Mike Morrissey, sales representative for US Boiler, were on-site to assist with the programming of the controls and optional IQ cards; the boilers were equipped with manual-reset low-water cutoff and auxiliary high-limit cards.

“For me, the rewarding part of returning to the

jobsite was comparing the installation to the drawings I did,” said Stanton. “Everything was identical to the diagrams, and the work was impeccable.”

At a time when most consumers are jumping on the gas bandwagon, the Northeast’s largest heating

service company is making winning plays with oil. Despite the wicked winter, the monastery burned **35 percent less fuel** than the year before. Given an average year, that number would have been closer to 45 percent; which is what Petro usually sees on other staged-MPO-IQ jobs.



Mike Morrissey poses with the two “before” boilers (above), and the multiple MPO-IQ installation “after” boilers (below)



# Staging Multiple Conventional Boilers

by Glenn Stanton,  
U.S. Boiler Company

Regardless of fuel type and availability - gas or oil - there's great potential to save big money on fuel and lifecycle costs for heating systems that serve buildings in the light commercial range.

Instead of installing one large oil boiler, systems that utilize several smaller units offer numerous benefits; at the top of the list, reduced fuel consumption and extended service life. So why isn't it more common? Usually, nobody wants to tackle the controls.

I've helped contractors design multiple boiler systems for large houses, apartment buildings, churches and public facilities. More often than not, they end up admitting that implementation of the controls is far simpler than they'd initially imagined.

Back when I first got involved with staging boilers in larger systems 25 or 30 years ago, there were several choices of what to use for controls. Most involved controls with simple on-off switching such as aquastats based on system water temperature. Technology has greatly advanced since then to incorporate computer logic to anticipate water temperature rise or fall instead of waiting for it to happen. The recent Sacred Heart job (see this month's feature article) is a great

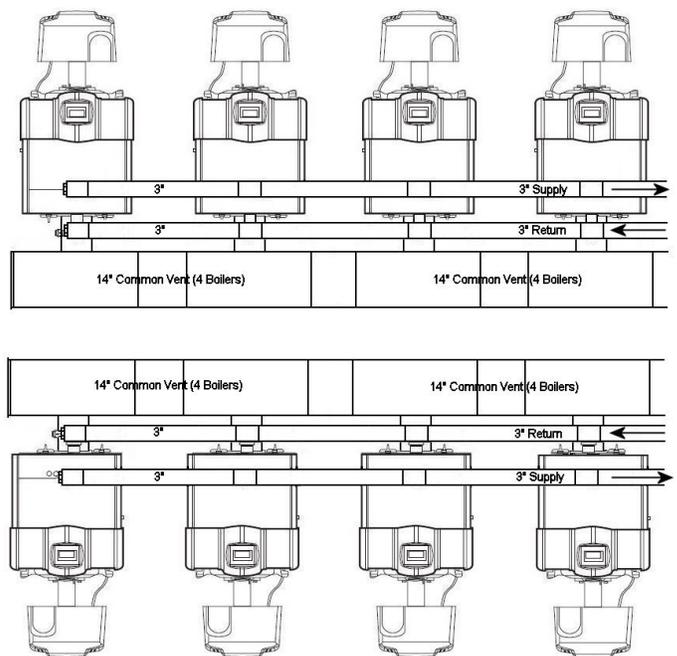
example of what's possible with a simple but state-of-the-art system control. While there are other system control products out there, nobody offers as wide an offering as tekmar.

## No brainer

The downsides to a multiple boiler system are really minimal, while the advantages are numerous. Yes, in many instances the cost of two or more smaller boilers may be more than the cost of a single boiler of equal capacity. But then again, when working with a larger commercial cast iron boiler, the sections will have to be assembled on site. Using two smaller boilers will allow you to install pre-assembled boilers and sit them in place and in many instances they may occupy less floor space than the single commercial boiler. And you have to purchase the controls themselves.

But that cost buys a *lot* of functionality. When there are multiple boilers in a mechanical room, a boiler that goes down now becomes an inconvenience instead of an emergency, as the second boiler will automatically take over the demand.

Aside from a few bitter nights every winter, a building rarely needs 100 percent input from its heating system. With a single conventional boiler, its burner is generally firing at 100 percent capacity regardless of what the demand for heat is – the



entire building or just one little zone. The ability to bring on only a fraction of total capacity has obvious fuel savings benefits (as modulating boilers prove), but don't ignore the positive implications for service life of the burners and their controls.

We all know that the number of cycles a boiler accumulates is the main deciding factor for how long the unit will last. Ideally, less On-Off cycles and longer running times will extend the longevity of the burner and controls. With the right System Control, the number of cycles in a multiple-boiler installation is shared evenly among units. The burner cycles and run times now are monitored by a control with the logic to know how quickly the system water temperature is rising and will only bring on another stage when it's needed.

At Sacred Heart, the system will try to satisfy a heat demand with 1/8 of its total capacity first. If the temperature rise of the system water is minimal, the control will bring on one additional boiler at a time until there's enough input to satisfy the system temperature demand. Once it's satisfied, it will begin dropping out stages until the water temperature remains constant. In this case, up to eight MPO-IQ-231 boilers or whatever is needed based on system temperature demand.

## Pretty straightforward

There's no real magic involved with setting up a system like this. Along with the main control and temperature sensors,  
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– “Multiples”, continued

tekmar supplies great schematics and instructions. I like to say they’ve done a great job of keeping it “simple and stupid.”

At Sacred Heart, an 8-stage tekmar Boiler Control 268 is the brain of the on/off firing of the boilers. Mounted on the basement wall near the boilers, it has eight sets of normally open relay contacts; one for each burner. The Heat Demand contacts of the 268 tekmar receive a 24 volt signal from the building’s existing Building Management System when there is a call for heat. This initiates a Heat Demand and the boilers begin to fire sequentially. The control comes all programmed with set defaults, which are easily changed with push-buttons and an LCD display screen.

The control regulates supply water temperature based on outdoor temperature for optimum comfort and minimum fuel consumption. In addition to a system temperature sensor, a return water temperature sensor can be used to ensure the return water temperature stays above a minimum temperature for the type of boiler(s) being used. The set delta-T can be changed according to the type of radiation and mass type of the boilers used. In this instance, the MPO-IQ boilers can withstand cooler than normal return temperatures without risk of condensing.

The control also can rotate which boiler acts as “lead” unit (first to fire), so that runtime hours will be nearly identical. The system also monitors stage runtime hours individually so

you can later track to see how the stages have been used. In most cases there are no external relays needed for circulators because the control contacts can handle 5-amp current draws. The control also has contacts to turn on a system circulator (if over 5 amps an external isolation relay is needed). It has contacts to open or close a combustion air damper motor or these contacts can be used as to activate a system alarm in the event the desired system temperature is not met in a preprogrammed time period.

In all, it took Petro’s wiring crew about a day to install the control and wire it to the individual boilers at Sacred Heart.

### Flexibility

While wiring and setup may be “simple and stupid,” the capabilities that controls like this provide are anything but. The flexibility is incredible. These controls can receive three different types of demands; heating demand with outdoor reset functionality, DHW demand (with optional priority), and a setpoint demand, which is unique among non-custom controls. The control also takes charge of temperature boost for DHW and Setpoint and can control the DHW circulator.

For example, we’ve done a number of church systems with multiple boilers. The church sanctuary is a very large zone that sees use only a few times a week. When there is a demand from that zone via a thermostat or setback thermostat the system brings the supply water up to 180°F to heat the room more quickly while coming out of temperature setback. The setback schedule can either be programmed into the control or by using a setback thermostat.

The staging sequence possibilities are almost endless. For instance, if you have two MPO-IQs installed with a four-stage control. When there is a heat demand, you can wire the two burners and boiler circulators so **stage one** turns on Boiler #1 circulator. If the latent heat in the boiler left over from the previous run cycle doesn’t satisfy the system temperature sensor, **stage two** will fire the Boiler #1 burner. **Stage three** brings on the Boiler #2 circulator only, with stage four bringing on Boiler #2 burner.

With the same controller on two commercial boilers equipped with Lo-High firing burners, each stage can bring on different levels of input on each burner individually with four stages of firing without inputting more than what the demand really needs. As stated earlier, the possibilities are endless as to what can be accomplished with these state-of-the-art controls and conventional on-off operation boilers.

If you’re not afraid to run a few extra wires, adding a simple control system to your bag of tricks isn’t difficult. It can mean better ROI and added value to the right customers.

*Glenn Stanton is Manager of Training and Technical Development for U.S. Boiler Co., Inc. With 42 years of experience in the Plumbing and Heating trade, he has a vast knowledge of nearly every aspect of heating systems and control systems. He can be reached at: [gstanton@usboiler.net](mailto:gstanton@usboiler.net)*

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