



Hauck Manufacturing Co.

Pulse Firing Delivers Performance on Multi Purpose Heat Treat Furnace

American Hydro, York, PA, manufactures industry leading hydroturbine equipment; specializing in hydro-turbine runners, the heart of hydroelectric plants.

To meet production demands, a new furnace was necessary for hot forming and stress relieving stainless steel runners. Heat treatment of a runner is critical. If the temperature is not uniform or properly ramped, the runner can be ruined. Since the runner contains extensive welds, post-welding stress relief is necessary - if the furnace temperature exceeds the base material temperature, an entire runner can be lost. With some runners valued at over one million dollars, scrap is not an alternative.

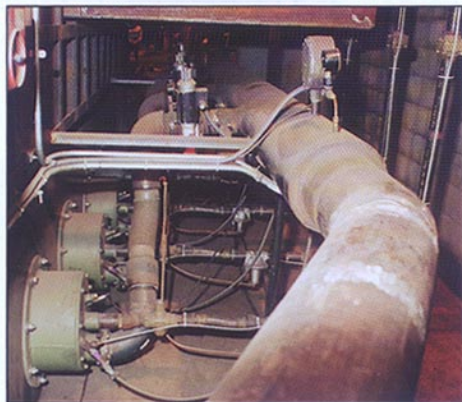
AH could design and build the furnace, but needed combustion equipment. Since hot forming and stress relieving temperatures vary approximately 1000°F, temperature control flexibility, temperature uniformity, and reliability were mandatory of the new combustion system.

Hauck Manufacturing Company proposed two combustion systems for the furnace. The first would use Hauck MVG Burners (high velocity) firing

with modulated control. The second employed the same high velocity burners and pulse firing. Realizing the need for excellent temperature uniformity and control, American Hydro's furnace design team decided that pulse firing was appropriate.

Upon installation of the pulse-fired system, the combustion equipment performance met AH expectations. A previous furnace without pulse firing struggled to maintain a 100°F spread on either heating process. The new system was able to maintain $\pm 25^\circ\text{F}$ without any problems. All temperature uniformity issues were resolved.

After ten years of successful heat treatment with the original pulse-fired furnace, a larger furnace to accommodate new runner designs was needed. In designing the furnace, AH decided to use the existing combustion equipment, however, they wanted to install new burner refractory tiles. AH was ready to purchase new tiles when Hauck suggested that they consider upgrading the burners to the SVG



Super Velocity Gas burner. Since Hauck designed the SVG specifically for pulse firing, it was quite likely that the new furnace would outperform the old one.

Upon reviewing the performance advantages of the SVG, AH was convinced that pulse firing an SVG was the best solution. Additionally, the SVG offered low NO_x emissions and had excellent ignition limits. The most important feature, however, was that the SVG offered a wider operation range and higher turndown - allowing AH additional flexibility.

AH enjoys all the benefits of pulse firing and the flexibility of SVG burners on the new furnace. The SVG burners light, stay lit and deliver the performance their processes need. AH now builds larger runners while improving furnace temperature uniformity to $\pm 10^\circ\text{F}$ and in some cases, maintains $\pm 5^\circ\text{F}$. Meanwhile, the combustion system provides the highest level of performance.

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