

V-Temp™ Economizer System for Optimized SCR Temperature Control

Selective catalytic reduction (SCR) is currently the most effective and proven method of post-combustion nitrogen oxides (NO_x) mitigation in power plants.

SCR technology and performance is closely related to boiler operation and is directly influenced by flue gas velocity, distribution and temperature as the gas flows through the system.

Problem recognized at reduced boiler loads

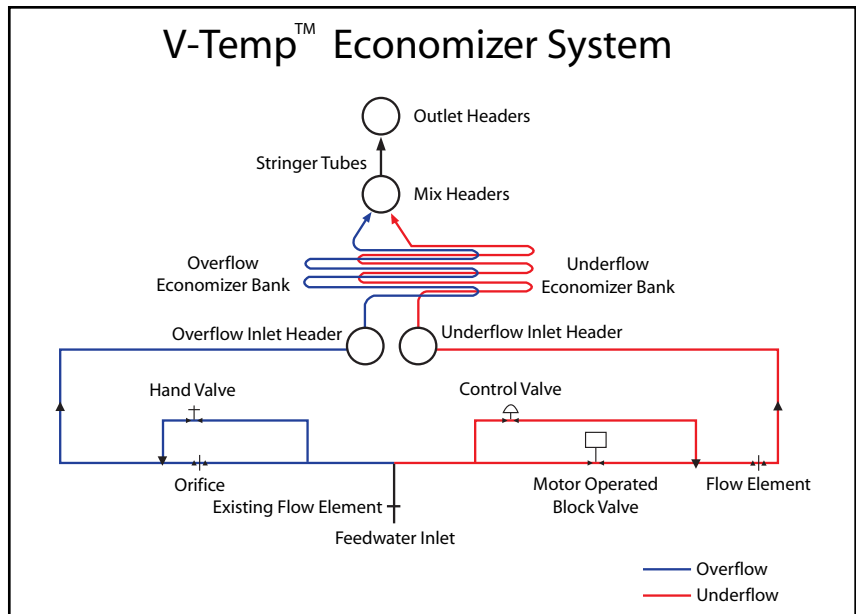
Reduced catalyst activity and/or ammonium bisulfate precipitation are two effects associated with low gas temperatures. Systems are designed for flue gas temperatures within specified temperature ranges for optimum SCR performance during normal load operation.

At reduced boiler loads, it is often difficult to maintain the minimum required flue gas temperature entering the SCR. Typical designs utilize a flue gas bypass system to control the temperature at this location. However, the large dampers associated with a flue gas bypass system are sometimes difficult to operate due to ash buildup.

Solution developed

Responding to this challenge, Babcock & Wilcox Power Generation Group, Inc. (B&W PGG) has developed an alternative solution. The V-Temp™ economizer system is an improved method of controlling SCR flue gas inlet temperatures.

The patented B&W PGG V-Temp system allows the boiler to operate at reduced loads with the SCR in service by maintaining



Flow schematic of a typical V-Temp™ economizer system.

the required minimum flue gas temperature at the SCR inlet. With this system, SCR performance is optimized, regardless of boiler load. The end result is a system that maintains unit efficiency at full load while optimizing SCR operation at reduced loads.

Improved SCR performance

The uniquely designed V-Temp system provides these benefits:

Economical

The V-Temp system requires less capital expenditure than alternative methods of flue gas temperature control. Additionally, the overall chemical costs of operating the SCR are reduced with optimized ammonia consumption at reduced loads.

Optimized SCR performance

By maintaining flue gas temperatures above the minimum requirements of the catalyst, ammonium

bisulfate salt formation on the catalyst is reduced or eliminated, resulting in longer catalyst life. As a result, fewer catalyst change-outs are needed during the life of the SCR system, reducing overall lifecycle costs. Additional benefits include less outages required to water wash the catalyst and reduced ammonia slip over time.

Improved load control

The V-Temp system controls flue gas temperature to a lower load range than flue gas bypass systems while maintaining unit efficiency at full load.

Low maintenance

Only minimal physical changes to the boiler are required with a V-Temp system installation. The large dampers associated with a flue gas bypass system, which tend to be difficult to operate due to ash buildup, are not required.

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