SO_3 Control

TIFI™ Targeted In-Furnace Injection™

Turn Your Plume into Profit

A return to burning higher sulfur coals or the use of SCR catalyst for NO_x control have created a number of problems for power generators. The most visible problem is SO_3 emissions, which can create a sulfuric acid mist resulting in a blue plume at the stack. Although "downstream" injection of reagents has been used to control blue plume, they do nothing to address other potential boiler problems. By employing an upstream approach using the TIFI™ Targeted In-Furnace Injection™ process, multiple significant performance benefits in addition to plume control can be achieved.

Blue plume clearly visible before TIFI program.

No visible blue plume after TIFI treatment.

Benefits

- Can eliminate Blue Plume
- Proven 4 to 1 return on investment
- Significantly increases heat rate efficiency
- Increases fuel flexibility
- Greatly reduces slag formation and fouling
- Reduces outage cleaning time
- Can eliminate popcorn ash and SCR fouling
- No impact on ash sales

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FUEL TECH®

Technologies to enable clean efficient energy™

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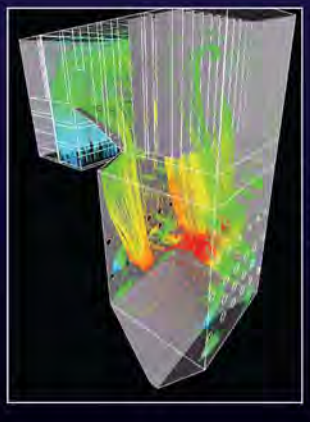
A Front-End Solution

The SO_3 program builds upon Fuel Tech's established TIFI™ Targeted In-Furnace Injection™ technology. The TIFI approach utilizes computational fluid dynamics (CFD) models and proprietary visualization software to determine the precise amount and location of chemicals to be fed into a boiler to achieve slag control and/or SO_3 mitigation.

With the SO_3 program, the boiler is modeled to optimize a chemical injection strategy, both from an operating and economic standpoint.

Treatment chemicals, primarily magnesium hydroxide, are mixed with air and water and custom-targeted at regions favoring chemical reactions for SO_3 formation or at problem heat transfer surfaces. The additive penetrates existing slag deposits to alter their physical crystal characteristics, reducing the structural integrity and strength of the slag. SO_3 is primarily reduced two ways: by a reduction in slag formation and through acid-base neutralization reactions.



CFD modeling of injected droplet trajectories.

Blue Plume Control is Only the Beginning!

Fuel Tech's TIFI™ Targeted In-Furnace Injection™ technology can reliably mitigate SO_3 formation. However, because it is an upstream program, benefits can go way beyond just plume control. In fact, utility cases have proven that the TIFI program can more than pay for itself. Benefits include:

Fuel Flexibility

Fuel Tech's TIFI technology can control plume regardless of fuel characteristics and sulfur content, allowing exploitation of alternate fuels.

Slag and Fouling Control

A cleaner furnace produces less SO_3, and it also is much easier to maintain. Users report significant improvements in water wall cleanliness and bottom ash handling. There is less slag/fouling and slag that is formed is more friable, leading to much easier removal.

A Cleaner SCR

Popcorn ash (slag) production routinely fouls catalyst screens. After TIFI treatment, users reported that SCR pressure drop no longer increased... and SCR cleanings decreased or were eliminated.

Slag before TIFI treatment.

After TIFI treatment, slag is more friable, weaker and more porous.

Better Boiler Efficiency and Heat Rate

With TIFI technology, a cleaner furnace leads to better heat transfer. Additionally, plants experience decreased resistance to flow through for downstream equipment. Efficiency improvements range from 0.5 to 1%, burning a range of coals and over a range of loads.

No Impact on Fly Ash

Fly ash has not been affected by TIFI treatment. Customers have reported no issues, whether the ash is sold for cement or ready mix or if it is landfilled.

Bottom-Line Impact: 4 to 1 Return on Investment

When it is all added up, users report a conservative payback of four dollars in operating savings for each dollar spent on the program.

TIFI treatment can solve your blue plume problem, while adding to your plant's bottom line.

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