

<b>Customer</b>	Agricultural Chemicals Producer	 <b>Strategic Solutions SSI Associates, Inc.</b>
<b>Service</b>	Integrated Environmental Technology Design	

## Integrated Design for Gaseous Emissions Control at an Existing Facility

**Selection, design and startup support for a sulfur emissions control system for an agri-chem producer**



### Challenge

A major international agricultural chemicals producer was required to upgrade an existing facility to meet new SO<sub>2</sub> limits. Furnaces required retrofit of abatement technology to reduce emissions from a range of 1,000 - 4,000 ppm to a maximum of 100 ppm, with the capability for future reductions to less than 50 ppm. Limestone Slurry Forced Oxidation (LSFO) technology was the logical technology; but, it would have been expensive and possessed less operational flexibility in terms of performance capacity. A more desirable alternative both for cost and operational efficacy was to integrate SO<sub>2</sub> abatement within an existing scrubbing system for furnace emissions particulate control. If technically feasible, the overall cost of an alternative technology solution should be less than a conventional LSFO retrofit.

### Approach

Strategic Solutions staff worked with the firm from project inception through full-scale implementation.

- **Technology Selection** - The principal constraint has been that only solution-based technologies could be employed (slurry systems would introduce additional particulate matter to the gas). Of the several solution-based technologies investigated, only lime-based dual alkali was determined to be feasible for integration with the particulate scrubbers; and only the concentrated mode would provide an economic advantage compared to a complete LSFO retrofit.
- **Technology Feasibility Testing** – Because the concentrated mode technology had not been demonstrated for the conditions presented by the combination of furnace gases and the particulate control devices, it was necessary to run a series of “full-scale” pilot tests. Strategic Solutions staff assisted in the development of test plans and provided onsite support for the testing. After the third successful test, it was decided to proceed with the integrated approach.
- **Process Design** – Strategic Solutions staff prepared the basic process engineering package -- material and energy balances and design specifications for all major equipment. Assistance was then provided through completion of detailed engineering/design including review of equipment bids, development of control philosophies, finalization of EFDs, and training guides.
- **Startup** – Strategic Solutions staff also provided onsite support for startup from pre-commissioning through initial full-scale operations.

### Value/Result

- The firm has been able to implement SO<sub>2</sub> abatement through integration with the existing particulate scrubbers at less than half the cost of a conventional LSFO retrofit.
- The sodium-based dual alkali technology is compatible with current plant operating systems and will minimize additional equipment maintenance requirements.
- The use of the sodium-based dual alkali technology results in nearly complete removal of the small amount of residual H<sub>2</sub>S in the gas, further reducing the environmental footprint of the plant

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