



# pH Adjustment of Power Plant Cooling Water with Flue Gas/Fly Ash

## BENEFITS

- Less water usage
- Waste reuse

## APPLICATIONS

- Electric Utility
- Water Supply
- Sewage Treatment

## PATENT PENDING

- SD 11372

## LICENSING & PARTNERING

Various licensing and partnering options are available.

Please contact the Intellectual Property Department to discuss.

## Technology Summary

Increased recycling of power plant cooling water calls for low-cost means of preventing the formation of calcium carbonate and silicate scale. Hardness (Ca and Mg) and silica are two of the primary water components that must be selectively precipitated or maintained in solution for intensive water recycling to be achieved. Sandia researchers propose that available on-site flue gas and fly ash could be used to control the pH of cooling water to prevent scale formation and achieve greater recycling.

This pH adjustment is a simple, inexpensive way to both prevent scale formation and to selectively precipitate problematic scale-forming solids. The discovery represents a cost-effective way to utilize materials indigenous to fossil fuel burning power plants to control mineral precipitation in cooling water.

Flue gas, which is 10% CO<sub>2</sub>, could be diverted into a plant's cooling water tower, or sidestream nanofiltration feedwater, to lower the pH and inhibit scale formation while fly ash could be used to raise pH to achieve lime softening. The same pH adjustment approaches might be applied to reduce the impact of silica scaling.

## Technology Readiness Level

Sandia estimates the technology readiness level (TRL) at 4. Key elements have been demonstrated in a laboratory environment.

**Bianca Thayer | 505.284.7766 | bkthaye@sandia.gov**



**Sandia National Laboratories**