

**You can call on us anywhere
in the world**

No matter where you are, ALSTOM ECS has the local expertise and global reach to work closely with you to define and meet your air emission challenges.

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**Wet Flue Gas
Desulfurization**

ALSTOM

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ALSTOM

**Power
Environment**

Wet Flue Gas Desulfurization



At TVA's Cumberland Station, an ALSTOM limestone Wet FGD with 6 absorber modules and 60 recycle pumps are used to bring this 2600 MW station into Clean Air Act, Phase 1 compliance.

Since putting into service the first, full-scale wet flue gas desulfurization system in the U.S. in 1968, ALSTOM has installed or is constructing wet FGD Systems on over 32,000 MW of fossil-fired power generation facilities.

Our designs are engineered for reliability. Whether their air pollution control needs call for retrofitting or rebuilding old facilities or designing equipment for a new plant, power producers are turning to ALSTOM for the most reliable wet FGD systems.

Reagent and Additive Processes from Traditional to State-of-the-Art

Lime and limestone are the most extensively used reagents in today's utility industry. ALSTOM has numerous commercial applications with these two reagents.

In addition to these traditional reagents, ALSTOM also has capabilities which enhance scrubber performance with additives such as dibasic and adipic acids, sulfur and thiosulfate, as well as, magnesium and sodium-enhanced lime and alkaline flyash scrubbing. ALSTOM can use ammonia as a reagent as well to produce as a by-product, the fertilizer, ammonium sulfate. ALSTOM has provided flue gas desulfurization systems using seawater to several international electric utilities.

Wide Range of Materials

From rubber-lined and flake-glass lined carbon steel to various high corrosion resistant alloys, ALSTOM has provided the most reliable and cost-effective materials to suit customers' needs.

Spray Nozzles

Design, selection and placement of spray nozzles is of critical importance in high-efficiency Wet FGD systems. ALSTOM's hollow-cone nozzles are positioned via computer modeling to achieve the maximum possible gas to liquid contact and scrubbing efficiency. Our scrubbers are proven to achieve the highest possible SO₂ removal of any FGD technology worldwide.

Spray Tower

ALSTOM developed the open-spray, tower design for Wet FGD. ALSTOM's first spray tower started up in 1975. The open spray tower provides reliable service while minimizing pressure drop and 100% turndown.

Mist Eliminator

One of the most important considerations in designing a flue gas desulfurization system is the removal of mist from the flue gas to keep downstream ductwork clean and to assure reliable operation of downstream reheat devices. Through extensive testing and experience, ALSTOM has developed a patented mist eliminator design for rugged, reliable, and efficient operation.

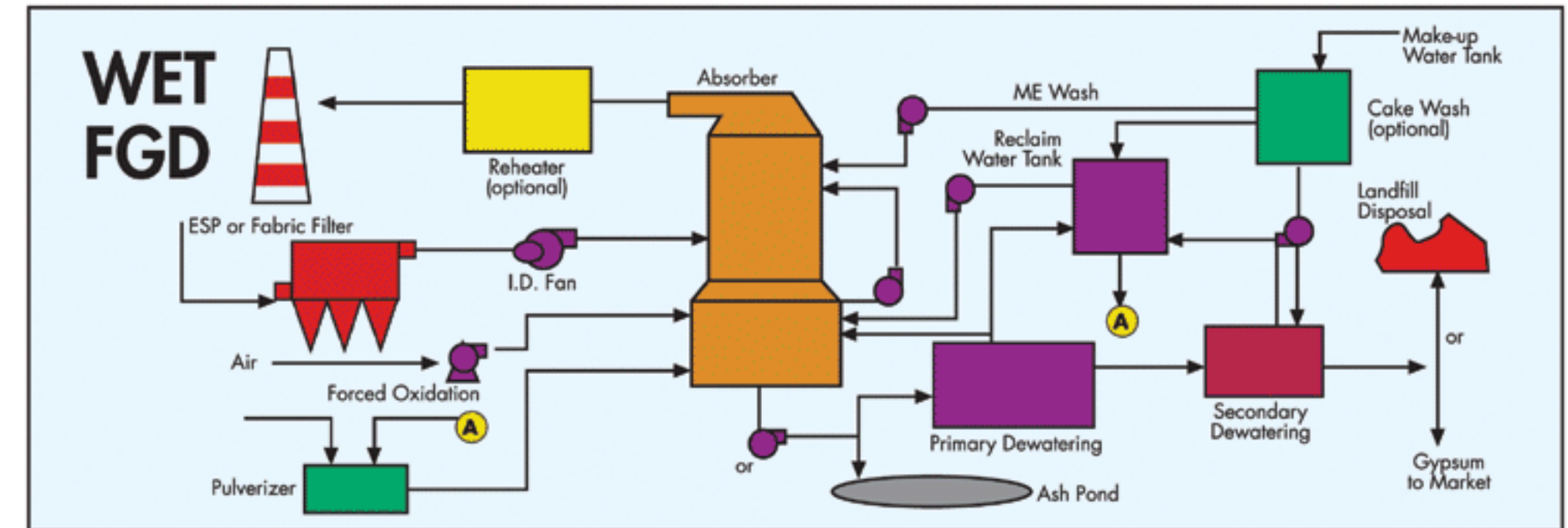
Wet FGD Designs Offering a Variety of By-Product Options

Gypsum Production

The in-situ forced oxidation technology producing gypsum, which is widely employed around the world, was developed by ALSTOM in the early 1970s. ALSTOM was the first to offer an open spray tower with in-situ forced oxidation at Louisville Gas & Electric's Paddy Run Station. Since this first demonstration, ALSTOM has continued to refine its technology. Today, ALSTOM has a number of commercial systems in operation or under construction which produce either wallboard grade or disposal grade gypsum.

Fertilizer By-Product

ALSTOM's wet FGD systems can be designed to provide ammonium sulfate fertilizer. The fertilizer can be made into standard grade, granulated or crystallized. This particular fertilizer contains sulfur, which is known to be depleted from soil in many areas.



Stabilized/Fixated Sludge

Many ALSTOM Wet FGD systems produce stabilized, or fixated, sludge. Mixing in soil or power plant flyash "stabilizes" the filtered sludge so that it can be disposed of in an impermeable and structural landfill. Adding lime or portland cement causes the sludge to harden through a pozzolanic reaction. This aggregate solid material can be landfilled directly or be used in commercial applications such as roadbed material.

Solutions to Meet Every Customer's Air Pollution Control Needs

Broad-Based Experience

With more than 30 years of experience, ALSTOM has created a database of performance and operating data unparalleled in the industry. This database gives ALSTOM the flexibility to execute wet flue gas desulfurization projects designed to meet individual customer concerns.

Turnkey Projects

Approximately 75% of the Wet FGD systems supplied by ALSTOM are turnkey projects. In these cases, utilities rely on ALSTOM to design, supply and erect all systems and support facilities.

At ALSTOM, turnkey means more than hardware. ALSTOM's turnkey projects mean service training and startup services that keep the project "on track." Through experience and coordination with other ALSTOM units, ALSTOM can provide creative solutions and steer customers through the often confusing regulatory and financial mazes that can delay a project.

CAD

State-of-the-art CAD capabilities allow ALSTOM's engineers to electronically create a fully-integrated design based upon standard "building blocks." The design manifests itself as scale models of future construction in three-dimensional space.

This sophisticated capability gives our designers several advantages, including use of standard designs, visualizing equipment placement, detecting interferences that could occur and ensuring adequate space among equipment for operations and maintenance. With CAD, our customers get an advanced look into the future of their projects.

Research and Development

ALSTOM is continually striving to offer customers the most advanced Wet FGD system technology and design. Dedicated revenues to research and development support an ALSTOM technology center which tests and collects data on existing systems, as well as, experiments with advanced technologies and pilot plants. Our extensive research in conjunction with the worldwide ALSTOM Research and Development Centers in the United States, Sweden, Germany, and Switzerland provides the know-how to serve various market needs throughout the world.