

# CASE HISTORY



## POWER GENERATION: SILO CLEANING WITH SONIC HORNS *A Sound Solution to Material Flow*



*Sonic Horn Mounted to Vessel  
to Promote Material Flow*

### INTRODUCTION

This job story focuses on the benefits of using acoustic sound generators in the silo clean-out of clinging bulk solid materials. The power generating station, located in the Middle Atlantic States, suffered from caked material (similar to coal fly ash) clinging to the walls of three silos. The build-up in the silos needed to be resolved in order to meet safety and liability requirements of the Plant's decommissioning standards.

### PROBLEM IN MORE DETAIL

Each of the three silos had a capacity of about 3,600 tons. Two of the silos contained a byproduct of the SO<sub>2</sub> scrubbing process known as MgSO<sub>3</sub>/SO<sub>4</sub> (density ≈50 pcf), while the third contained a high grade, pozzolanic, coal fly ash (density ≈90-100 pcf.) The thickness of the build-up ranged from a dusting to more than about 2 inches in isolated spots; there were no large masses.

### SOLUTION

The original intent was to mechanically scrub the silo walls with a boom mounted Bin Whip System, however, the location and configuration of silo roof openings would have limited the effectiveness of this method. As a result, it was decided to utilize MARTIN® air-driven, high-energy Sonic Horns. Acoustic cleaning works by generating powerful sound waves which shake particulates loose from surfaces, eliminating the need for wet or dry manual cleaning. Before attempting to clean the silos, all free-flowing material was removed by gravity feed via truck-loading chutes located below the bottom of the silos. The Sonic Horn was positioned inside the top of each silo, energized, and slowly lowered to the bottom of the silo and back up over the course of a full shift. This process was used for all three silos. The material clinging to all inner surfaces of the silo immediately dislodged in an impressive flow of product. After the initial surge, product continued to fall over the entire period of application. The resulting debris was loaded out by gravity feed for disposal and amounted to an additional 5-6 tons of material extracted from each silo.

### CONCLUSION

As this case study shows, results were immediately apparent upon start-up of the sonic horn. All three silos were cleaned within three days and all the work was done without personnel entering the vessels. Since the Sonic Horn was simply lowered into each silo, it is speculated that providing some means of aiming the Sonic Horn's energy waves directly onto the silo walls may improve its effectiveness even more.

For more information on Sonic Horn Silo Cleaning and other products and services provided by AIRMATIC INC, [click here](#).

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