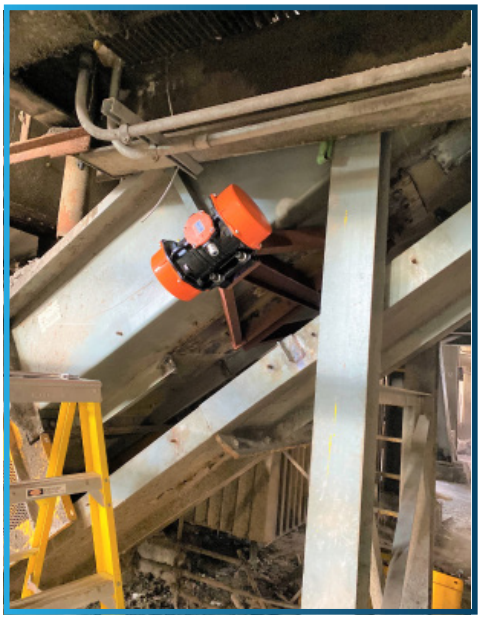
CASE STUDIES

Power Generation: Power Generation From Waste Ash Dewatering Through Applied Vibration

A Simple Approach to Reducing the Cost of Transport

Introduction



This job story focuses on a unique, customized approach to quickly and efficiently reducing the water content of waste ash so that the cost of transporting the ash can be reduced. The customer in this case is a world-leading waste-to-energy provider that stood to save hundreds of thousands of dollars by reducing the weight of its waste ash prior to transport.

Problem in more detail

Waste-to-Energy (WtE) plants (also known as Energy-from-Waste [EfW] plants) safely convert approximately 21 million tons of waste from municipalities and businesses into clean, renewable electricity, while also recycling 600,000 tons of metal annually. The process includes incinerating garbage at 2000°F. One byproduct of this is hot waste ash. The ash is ultimately used to cover landfills, but first it must be cooled. This is accomplished by combining it with water, which adds weight to the ash. That additional weight adds significantly to the cost of transporting the ash by truck or railcar Many WtE plants rely on uphill gravity water reduction to reduce the water content of their cooled ash. In this method, the ash is conveyed uphill, and water separates from it in the process. Unfortunately, the approach is not as effective as it could be. Our customer wanted to improve on it. Specifically, the customer had a goal of reducing the physical weight of its cooled ash by 15%, a reduction that would yield shipping cost savings of $200K per year.

Solution

AIRMATIC Application Specialists and Engineers knew that vibration could do a better job of removing water from the ash. But the vibrators would need to be installed in a very particular manner in order to be effective.

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The AIRMATIC team recommended the creation of site-specific, proprietary mount brackets that attached to the underside of the customer's ash waste chutes. These application-specific brackets enabled the installation of correctly sized and securely mounted rotary electric vibrators. When properly placed and secured, the vibrators would produce a directed force that would break the surface tension adhesion of the water to the ash. The solution worked just as expected and the vibration induced more water to separate from the ash and return to the cooling pool. But how much extra water was removed? To confirm the water weight reduction, the ash was tested prior to and after the induced vibration. The new water removal process was found to have provided for a 14% reduction in weight, enough to save the customer $187K in shipping costs per year.

Conclusion

As this case study shows, installing proprietary mount brackets and properly sized rotary electric vibrators can deliver significant savings for WtE facilities by more effectively removing water from cooled ash waste. There's another advantage as well: The less water remaining in the waste ash, the less chance there is that contaminated water will escape from trucks and railcars and out into the environment while the ash is in transport, creating problems with the EPA. Pleased with the success of this approach, the customer has contracted with AIRMATIC to install the same solution at more of its WtE plants across the U.S.

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