

PRODUCTS AT WORK

Strobic Air Tri-Stack® Fans Address Brick Hospital Diesel Generator Exhaust Issues

Background

Emergency diesel generators are necessary evils at all hospitals. No one likes to have them around, but they must be available to provide immediate backup electrical power in case of sudden power failure.

When the facilities engineer at Brick Hospital, in Brick, NJ, discovered that emergency generator exhaust was being re-entrained into the fresh air intake ventilation system of the building's West Wing, new ducting was constructed leading to the roof of the existing South Wing in an attempt to correct the problem. The result was not favorable. In fact, when it was relocated, the exhaust was also re-entrained into the South Wing's ventilation air intakes, actually creating more of a problem than if it had been left where it was. "We were living with that problem for about seven years," said the facilities engineer.

Results

Eliminating the re-entrainment problem was Brick Hospital's main concern. The facilities engineer contacted a leading consulting engineering firm in New York City who recommended that Strobic Air Tri-Stack Fans be mounted on the roof to serve the two generators. When dealing with re-entrainment problems, crosswinds can cause many issues. In this particular case, with a 10 MPH crosswind, the Tri-Stack fans – rated at 20 hp and 15 hp respectively, with the 20 hp fan operating at about 7600 CFM – are able to project the exhaust stream at a nozzle velocity of over 4,600 FPM, allowing it to rise to a height of approximately 65 feet above the roofline, providing effective dissipation and preventing any possibility for re-entrainment.

In configuring this system, the consulting engineering firm terminated the existing flue pipes on the roofs of the South and West Wings, intercepting them and forming new transition sections to

connect to the fans. A minimal amount of reinforcing steel was added to the building's roof framing structure. Each Tri-Stack fan was bolted to its curb, and each curb was bolted through the roof to the supplementary support steel. And because the Tri-Stack fans are precisely balanced and use direct drive motors, there was no need for additional vibration isolation, resulting in significant savings compared to most other fans in the industry. Brick Hospital's facilities engineer was pleased. "The fans operated smoothly with no sensation of vibration below in the occupied spaces," he stated. "And from an aesthetic standpoint, these fans are barely noticeable from the surrounding area. Thanks to their capabilities, there was no need for any tall flues or stacks."

A secondary concern – the temperatures of the flue gases coming from the diesel generators are 840° F. – was also easily addressed by the Tri-Stack fans, which mix the flue gas with ambient air at a 560% dilution ratio, effectively providing about 43,000 CFM total at 186° F and eliminating the need for a high temperature nozzle. This saved the Brick Hospital extra costs by diluting the temperature low enough where a standard nozzle, made of fiberglass instead of stainless steel, was used.

The elimination of re-entrainment, the industry's lowest vibration standards, and economically diluting high flue gas temperatures left the Brick Hospital fully satisfied with their Tri-Stack fan systems.

Present Status

15 years later, the Strobic Air Tri-Stack fans are still running and performing as promised, preventing re-entrainment, diluting the odor, and producing very little noise. The mixed flow impeller design, low vibration, and high dilution rate are key factors to the longevity and success of the Tri-Stack fan systems.



Application: Prevent diesel generator exhaust re-entrainment and eliminate odors

End User: Brick Hospital, Brick, NJ

Process: Diesel exhaust from backup generators

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