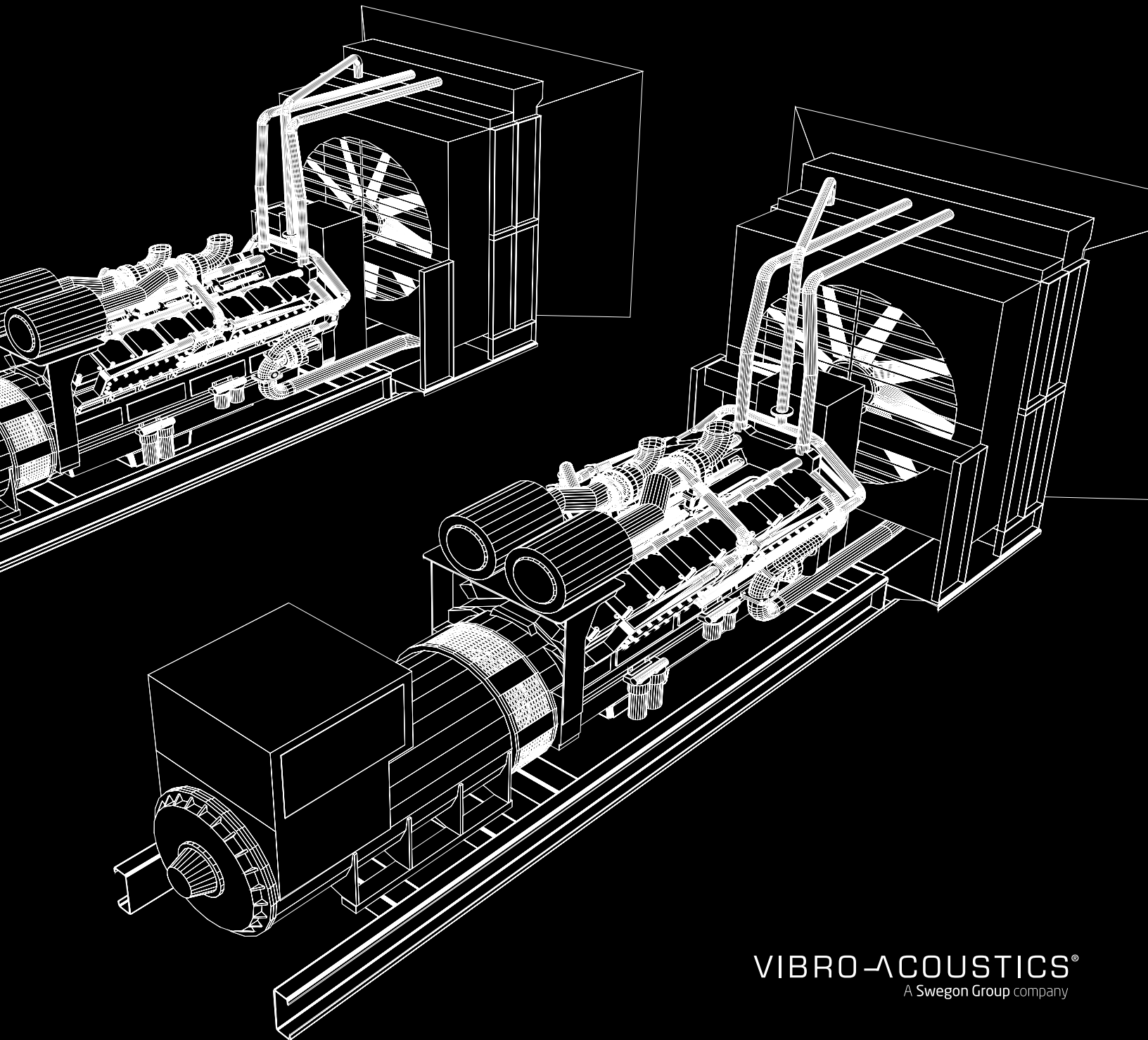


GENERATOR NOISE CONTROL SOLUTIONS



VIBRO-ACOUSTICS®
A Swegon Group company



GENERATORS

Emergency backup generators are commonly used in hospitals, data centers, laboratories, first responder facilities, wastewater treatment facilities and communication facilities where an uninterrupted source of power is necessary.

THEY ARE ALSO FOUND IN commercial office buildings, schools, and condominiums to provide backup power for elevators, emergency lighting, fire pumps and computer servers.

Typical design practice is to place generators inside the buildings, at grade or in the basement with openings for cooling air intake and discharge. These openings cause the noise from the generator to escape out of the generator room into the atmosphere, causing municipal noise by-law infractions and disturbing the neighbors.

NOISE PROBLEMS

Generators must be exercised periodically to ensure they are ready for the next emergency, but doing so disrupts building occupants and nearby businesses and residents.

OCCASIONALLY, generators are used during non-emergency times to provide main power to a building to offset the higher costs from the electricity supply utility; this is known as “peak-shaving”.

There are many noise paths from engine generators that must be considered (see Fig. 1 for examples). Any of these paths, if not treated correctly, can lead to noise problems that could result in regulatory violations and financial penalties. Addressing each noise path is not as simple as merely adding attenuation. A lot of other factors need to be considered. These include ventilation requirements, pressure drop considerations, space constraints, aesthetics and materials of construction.

Generator noise sources include the engine, radiator fan, turbo-chargers and exhaust—each producing extremely high noise levels. When combined, these sources create broadband noise levels in excess of 110 dBA. Many generators are located near noise-sensitive areas including residential neighborhoods and commercial property lines. If noise levels exceed local noise code regulations, hefty fines can be issued, leading to a total shutdown of the facility.

Complicating factors to be considered in mitigating these high sound levels include space constraints within the generator room and the relatively low capacity of radiator fans to accommodate additional pressure drop. “Standard” straight silencers may not fit or allow adequate room for transitional connections to the radiator or to louvered building openings.

It is essential that silencers used to attenuate air-borne noise paths add minimal pressure drop to ensure adequate cooling airflow. Aerodynamic system effects caused by proximity of each component in the air path must be taken into consideration.

NOISE PATHS

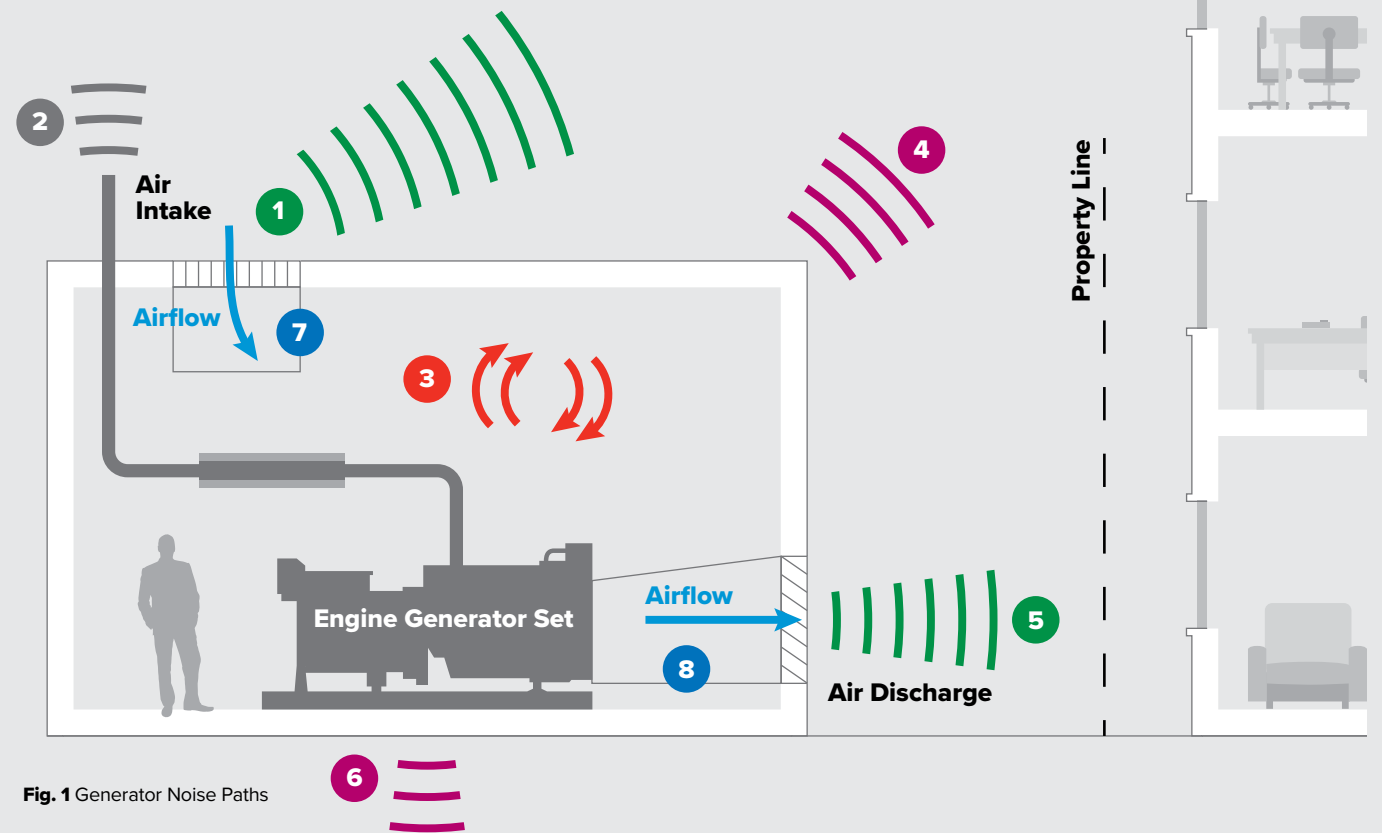


Fig. 1 Generator Noise Paths

GENERATOR NOISE PATHS

- 1 Noise transmission through air intake opening
- 2 Noise transmission through engine exhaust
- 3 Noise build-up due to reverberation inside room
- 4 Noise transmission through building walls and roof
- 5 Noise transmission through air discharge/exhaust opening
- 6 Noise transmission through the floor of the room
- 7 Noise break in/out from the air intake duct
- 8 Noise break in/out from the air discharge/exhaust duct



Typically, generator radiator fans can only handle 0.5" wg pressure drop

GENERATOR NOISE CONTROL SOLUTION

Vibro-Acoustics provides a no-obligation application engineering Lay-In Service to analyze project-specific generators system design and provide an optimal solution.

WE PROVIDE a noise control solution that integrates with the system and addresses all noise sources and paths so that the project's sound criteria are achieved.

The generator noise control solution enables the consulting engineer to place a solution that will work in tight spaces and consider energy efficiency. Building owners can test their generators without disrupting occupants or violating noise by-laws and regulations. What the engineer and contractor receive is an integrated solution to address multiple areas of concern with a single-source responsibility.

Targets problems 1

Intake Silencers/Louvers To reduce noise transmission

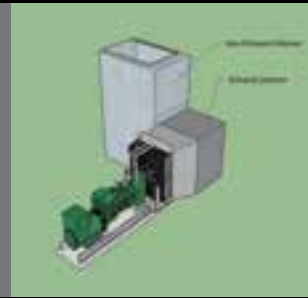
Vibro-Acoustics' intake silencers reduce noise transmission through the air intake openings for the generator room.



Full-height splitters can be used in lieu of silencer "cubes" for some intake and exhaust shafts to reduce contractor installation costs. These splitter sections are inserted into shafts without any external casing. Since concrete shafts are often not perfectly square, this option may be much easier to install.



Different configurations are available to suit project specific needs.



Targets problems 7 8

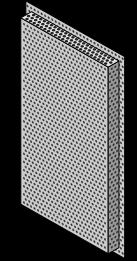
HTL (High Transmission Loss)

HTL casing applied to silencers ensure that noise does not break in/out of the generator room through the silencer casing.



Vibro-Acoustics provides aerodynamic calculations stamped by a Professional Engineer. The maximum recommended combined pressure drop including system effects for both intake and discharge silencers is 0.3" wg or less.

Targets problems 3



Absorption Panel To absorb noise and reduce noise reverberation

Vibro-Acoustics' absorption panel lined walls help absorb noise and reduce noise build-up and reverberation in the generator room.

Targets problems 5

Discharge Silencers/Louvers To reduce noise transmission

Vibro-Acoustics' discharge silencers reduce noise transmission through the air exhaust openings of the generator.



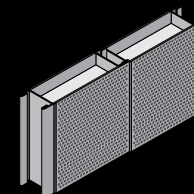
There are many options to save space and minimize pressure drop. Transitional silencers and full-height baffles are two examples.

Targets problems 6

Floating Floors To reduce noise transmission

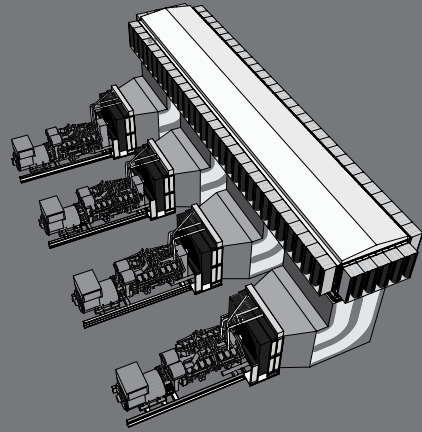
Vibro-Acoustics' floating floors installed under the generator rooms reduce the noise transmitted through the floor of the generator room.

Targets problems 4



Acoustic Panels To reduce noise transmission

Vibro-Acoustics' acoustic panels reduce noise transmission through the walls of the generator room.



Vibro-acoustics application engineers offer creative and pragmatic solutions to overcome challenges, such as:

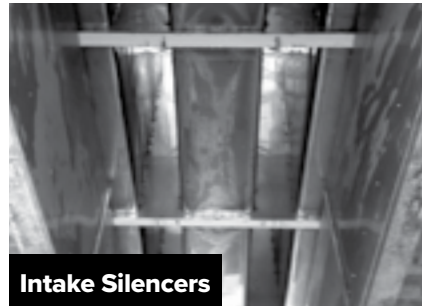
- > Stringent noise criteria
- > Close proximity to property lines
- > Low available pressure drops
- > Limited generator room space



No two generator applications are the same.

The one-size-fits-all solution does not work. We engineer the best acoustic and aerodynamic solution in the most cost effective manner to resolve your generator problems.

Please see our website at www.vibro-acoustics.com for more information on our products and services.



Intake Silencers



Generators with Airfoil Louvers



Discharge Silencers with Absorption Panels



Generator Enclosure with Elbow Silencers

ENSURE NOISE & BY-LAW COMPLIANT SOLUTIONS BY TAKING ADVANTAGE OF OUR APPLICATION ENGINEERING SERVICES



Contact your local Vibro-Acoustics sales representative or get in touch with us to find out more about our generator noise control solutions and Lay-In Service. Call **1-800-565-8401**, or email info@vibro-acoustics.com.

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