

Control of Emissions from Idling Locomotives

In 2008, The U.S. Environmental Protection Agency (EPA) adopted new more stringent emissions standards and mandated the application of idle-emission controls on newly manufactured and remanufactured locomotives. This fact sheet provides technical background on the issue of locomotive idling and describes what EPA is doing to reduce emissions from this source.

Why do railroads allow locomotives to idle?

During normal railroad operations, locomotives sometimes must wait for freight cars to be switched and/or picked up, for another train to clear track on which the locomotive is to proceed, or for mechanical service. Historically, locomotives have been left idling while they are waiting. In some cases, there are practical or safety reasons why locomotives need to be left idling. In other cases, locomotive operators might simply idle the engines due to custom, habit, or misunderstandings about diesel engines. As we describe in this fact sheet, EPA is working to address all of these causes.

The reasons why current locomotives may need to be left idling can be technological or related to worker and passenger needs. First, diesel engines can be difficult to start in extremely cold temperatures, especially larger diesel engines such as those used in locomotives. Also, locomotive engines are typically designed to use water without antifreeze because water is more efficient at cooling the engine. However, the water can freeze in cold weather and crack the engine block. As a result, shutting locomotives off in cold weather has historically been avoided as much as possible.

Locomotive engines may also need to idle in order to maintain critical functions such as air pressure for the braking and starting systems and battery charge. Maintaining air pressure for braking is especially important since it can directly affect safety. Finally, in some cases, locomotives will idle to supply air-conditioning or heat to its crew and/or passengers, in part to comply with regulations and contractual requirements related to working conditions for the crew. (Note that the requirements related to working conditions are not regulated by EPA).

What is EPA doing to control idle emissions from locomotives?

EPA is working hard to reduce emissions from locomotives, both while they are pulling freight and while they are idling. However, the Clean Air Act does not give EPA unlimited ability to regulate locomotives. Section 213(a)(5) and related provisions provide EPA the authority to establish emission standards for newly manufactured and remanufactured locomotives, as well as to prohibit railroads or anyone else from tampering with emission controls. For locomotives not yet required to use the idle reduction technologies, the Clean Air Act provisions do not appear to provide EPA with particular authority to prevent railroads from allowing them to idle. Thus, as described below, EPA's regulatory efforts to reduce emissions from idling locomotives focus on requiring the application of automatic idle reduction technologies to the locomotives themselves rather than directly regulating when railroads may allow locomotives to idle.

EPA's 2008 rulemaking represents an important step in its efforts to reduce emissions from idling locomotives, which began in 1998, when EPA finalized emission standards for locomotives that provided significant emission reductions for all types of operation. Those initial standards went into effect in 2000. In addition to applying to all newly manufactured locomotives, the standards also require most existing locomotives be retrofitted with emissions controls when they are remanufactured. (This generally happens every five to 15 years, depending on the locomotive). These retrofit requirements have already begun reducing emissions from existing locomotives. Note that by requiring overall reductions in emissions, the requirements have led to locomotive exhaust being cleaner when a locomotive is idling, and will continue to make them even cleaner in the future.

In our 2008 rulemaking we adopted new requirements to further reduce emissions from idling locomotives by requiring technology that reduces the amount of time a locomotive spends idling and applying tighter emission standards to new locomotives generally. EPA is requiring that all newly manufactured and nearly all remanufactured locomotives be equipped with idle reduction technology that will automatically shut locomotives down if they are left idling unnecessarily. While such devices cannot eliminate all idling, they can reduce most unnecessary idling. These automatic controls offer more opportunities for a locomotive to be shut down by monitoring multiple critical system parameters to determine when it is safe to shut down a locomotive, relieving crews that may not have the manpower to monitor all of these parameters. In the field, these devices have proven themselves to be safe, reliable and extremely cost effective by providing reduced fuel consumption that can pay for the equipment in short order. We believe the cost savings associated with these devices will provide significant incentives for railroads to fully utilize this equipment.

Our regulations also include a rigorous emission testing program to make sure locomotives comply with our emission standards for their operational life. Our complete program will reduce NO_x, HC, and PM emissions by about 90 percent. These standards will also significantly reduce smoke emissions and exhaust odors.

In designing this locomotive emission-control program, we established several provisions to ensure that emissions are reduced at all operating conditions, including while idling. First, we require that most locomotives comply with the emission standards over two different duty cycles: a high-power cycle that represents cross-country operation and a low-power cycle that

represents freightyard operation. To comply with these requirements, locomotive manufacturers need to reduce emissions for all power levels from idle to full power. We also require railroads to improve their maintenance practices so that when locomotives are idling, their emissions are kept as low as would be expected from a brand new locomotive. Finally, we require that malfunctioning idle reduction equipment be repaired in a timely manner.

When will these mandatory emission reductions occur?

Emission standards and other requirements began reducing idle emissions as early as 2000. However, because it is common for locomotives to remain in service for as long as 50 years, the number of new ultralow-emission locomotives in a railroad's fleet will be small during the start of this program. Therefore, we have designed other parts of our program to achieve more immediate reductions, such as the requirement that older locomotives be retrofitted with emission controls when they are remanufactured and provisions that require the use of automatic engine-shutdown features. Even so, it may take several years before these regulatory improvements approach full effectiveness as the fleet turns over from older locomotives to new less polluting locomotives.

What are railroads doing to control idle emissions from locomotives?

EPA has been working with the nation's major railroads to implement voluntary efforts to reduce idle emissions beyond the mandated reductions. All Class I railroads have joined the SmartWay Transport Program: CSX Transportation, Norfolk Southern, Canadian National Railway, BNSF Railway Co., Canadian Pacific Railway, Kansas City Southern Railway, and Union Pacific Railroad Co. Reducing idling is one way these companies can improve overall efficiency and reduce fuel costs. They can accomplish this through a variety of technologies and strategies, including automatic engine stop-start systems, auxiliary power units or diesel-driven heating systems, electrical shorepower connections, and company idle-shutdown policies.

What can I do about locomotives idling in my neighborhood?

You should first contact the local railroad facility and ask about its operating practices, including the shutdown policy. If they are unable to help you, you might want to contact the corporate headquarters. Addresses and phone numbers for the major railroads are listed below.

BNSF Railway	CN (includes Canadian National Railway and its U.S. operating subsidiaries, including Grand Trunk Western, Illinois Central and Wisconsin Central).
2650 Lou Menk Dr.	935 de La Gauchetier St. W.
Fort Worth, TX 76131-830	Montreal, Quebec H3B2M9
800-795-2673	Canada
	888-888-5909

Canadian Pacific Railway (Includes SOO lines)	CSX Transportation
501 Marquette Ave.	500 Water St.
Minneapolis, MN 55402	Jacksonville, FL 32202
1-800-776-7912	904-359-3100

Kansas City Southern Railway Company	Norfolk Southern Corp.
PO Box 219335	3 Commercial Pl.
Kansas City, MO 64121-9335	Norfolk, VA 23510-2191
816-983-1303	757-629-2600

Union Pacific Railroad
1400 Douglas St.
Omaha, NE 68179
888-877-7267

For More Information

You can access documents related to our regulation of locomotives on EPA's Office of Transportation and Air Quality Web site at:

www.epa.gov/otaq/locomotives.htm

Documents related to EPA's voluntary idle-reduction programs are available at:

www.epa.gov/smartway/technology/idling.htm

For further information, please contact us at:

Contact for Regulatory Programs	Contact for Voluntary Programs
Assessment and Standards Division	SmartWay Transport Partnership
U.S. EPA	U.S. EPA
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