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Workgroup Recommendations and Other Potential Control Measures
Diesel Initiatives Workgroup

DI003 – Idling Reduction for Train Engines

DESCRIPTION

Locomotive idling contributes to statewide emissions of PM2.5. Local concentrations of diesel exhaust may exceed allowable health risks where locomotives idle for hours and days at a time. For example, the "Roseville Railyard Study" by the California Air Resources Board showed that locomotive idling contributed about 45% of the total diesel particulate matter emissions from the railroad operations, and these emissions resulted in maximum off-site cancer risks of 900 to 1,000 in a million.[(1)]

A regulation could be written using existing authority under the Clean Air Act and N.J. Air Pollution Control Act that would encourage the use of idle reduction technologies and/or limit idling of locomotives. The regulation could initially require that information be collected by railroads and reported to NJDEP, such as where and why a locomotive was idling in excess of 15 minutes. This information would be used to identify opportunities to reduce emissions. The regulation could also exempt from reporting locomotives that have installed idle reduction technology, thereby encouraging the installation of this technology. The regulation could also require that idle reduction technology be installed in locomotives that operate in N.J.

There are a variety of legal issues that arise when regulating locomotive idling, such as whether an idling regulation would be preempted by federal laws including the Clean Air Act and Interstate Commerce Commission Termination Act (administered by the Surface Transportation Board). The Surface Transportation Board ruled that not all state and local regulation is preempted: "We stated that state or local regulation is permissible where it does not interfere with interstate rail operations, and that localities retain certain police powers to protect public health and safety."[(3)] Recent regulations proposed by the South Coast Air Quality Board and Massachusetts offer a similar approach to limit idling.

There are many idle reduction technologies commercially available and in use that will produce fuel savings, emission reductions and reduced engine wear. There are fuel-fired or electric heaters that allow a locomotive engine to stay warm, which are suitable for locomotives that are permanently located in a single location (switch or passenger locomotives). In addition, there are technologies that automatically start and stop locomotive engines. SmartStart is a microprocessor technology that automatically manages locomotive shutdowns and startups. It constantly monitors all of a locomotive's operating systems (engine temperature, brake pressure, etc.) to ensure that the locomotive is ready to operate when needed. The most effective choice is a combination of a diesel driven heating system and the SmartStart system.

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IMPLEMENTATION
A regulation on idling could take several different forms. Implementing a regulation that simply requires recordkeeping would have few barriers to implementation. Collection of idling occurrence data would help NJDEP determine whether additional regulation, such as limits on idling, is necessary and appropriate. Idle reduction technology is available, effective at reducing idling by up to 90 percent [(4)], and cost-effective.

COST
The cost to purchase and install a technology like SmartStart is approximately $10,000. The cost of a Diesel Driven Heating System is approximately $28,000. The use of these two technologies together, including installation, would be approximately $35,000. They would pay for themselves in avoided fuel costs in approximately 15 months at a fuel price of $2.00 per gallon [(5)].

EFFECTIVENESS
Idle reduction technologies can reduce idling up to 90 percent, depending on which technology is employed in which application. A 90 percent reduction in idling would be expected to reduce fuel consumption by 40 to 60 percent [(2)], with a proportional reduction in emissions of NOx and PM2.5.

COST EFFECTIVENESS
The use of idle reduction and heating system technologies together would be approximately $35,000 and the product will pay for itself in avoided fuel costs in approximately 15 months at a fuel price of $2.00 per gallon [(5)]. The Vancouver, Washington study[(6)] reports cost-effectiveness for use of diesel driven heating system and SmartStart to be $809/ton of emissions, not including additional unquantified savings due to reduced maintenance costs on the locomotives. Given the short payback periods, the long term reduction in fuel usage, and the reduced maintenance that result from idle reduction technologies, a regulation that either promoted or required use of these technologies appears to benefit both rail operators and the residents of New Jersey.

SOURCES
1. "Roseville Railyard Study", California Air Resources Board, Oct. 14, 2004, Table IV.
2. "Union Pacific and the Environment" fact sheet, www.unionpacific.org.
3. *Borough of Riverdale Petition for Declaratory Order re: The New York Susquehanna and Western Railway Corporation*, Surface Transportation Board Finance Docket No. 33466, Sept. 9, 1999.
4. Data supplied by ZTR Control Systems, makers of SmartStart, showing recorded data from 1993 to 2005 in Canadian Pacific locomotives in British Columbia.

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5. "Case Study: Chicago Locomotive Idle Reduction Project", U.S.E.P.A., March 2004. EPA420-R-04-003.
6. "Vancouver, Wa. Switchyard Locomotive Idle Reduction Project, Final Report to EPA", Southwest Clean Air Agency, Vancouver, Wa., October 18, 2005.

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