

## List of ARB Measures Proposed for Development

Lists measures to be developed by the ARB as part of the 2003 State and Federal Strategy and the 2000 Diesel Risk Reduction Plan (DRRP)

<b><i>On-Road Motor Vehicle Measures</i></b>		
	<b>Strategy</b>	<b>Proposed Date for Board Consideration</b>
1.	<p><b>Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program</b> (NO<sub>x</sub>, ROG)</p> <p>ARB is currently performing a test program to evaluate the potential benefits of mandatory replacement of catalysts, oxygen sensors and evaporative emission carbon canisters on older passenger cars. The decision on whether to proceed with a mandatory program is expected to occur in 2004, with regulations to follow in 2005, if the pilot program shows the potential for significant benefits (NO<sub>x</sub> and ROG emission reductions) at reasonable cost and funding can be identified.</p>	2005
2.	<p><b>Capture and Control Vapors from Gasoline Cargo Tankers</b> (ROG)</p> <p>Gasoline cargo tanks are equipped with a vapor recovery system that returns and collects gasoline vapor during the loading at terminals or bulk plants and unloading at service stations respectively. Cargo tanks utilize hoses and fittings during the process of delivering gasoline and collecting gasoline vapor. The proposed measure would require:</p> <p>1) control technologies to reduce ROG emissions from gasoline evaporated from the transfer hoses and connections on the tanks after the delivery is completed (the control technology necessary to implement this measure is currently available), 2) a monthly inspection and maintenance program to check the vapor connections and hoses on the fuel cargo tankers, 3) cargo tanks to be purged using an approved method prior to any maintenance or repair being performed, and 4) developing performance specifications and standards for individual components of gasoline cargo tanks and methodology for testing and certifying these components.</p>	2006

	Strategy	Proposed Date for Board Consideration
3.	<p><b>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet</b> (PM10, PM2.5, NOx, ROG)</p> <p><b>a) On-Road Public Heavy Duty Vehicle Fleets</b> Publicly owned or operated fleets include dump trucks, street sweepers, shuttles, and other non-transit buses. The regulation would require the reduction of diesel PM emissions through the application of best available control technology (BACT) to 1960-2006 model year vehicles. Four options would be offered to meet the requirement to use BACT: 1) use of a diesel engine or power system that is certified to the 0.01 g/bhp-hr PM standard, 2) use of a diesel engine certified to 0.1.g/bhp-hr PM along with application of the highest applicable diesel emission control system, 3) use of an alternative fuel engine, or a heavy-duty pilot ignition engine, and 4) application of diesel emission control strategy or system verified by ARB that reduces diesel PM emissions by the greatest amount possible for that engine and application. This is both a NOx control and a diesel risk reduction measure</p> <p><b>b) Transit Bus Fleets</b> Future revisions to the existing Transit Bus Fleet Rule would require transit agencies to reduce emissions from non-urban buses they own or operate. This is both a NOx control and a diesel risk reduction measure</p> <p><b>c) On-Road Private Heavy Duty Vehicle Fleets</b> Examples of on-road private fleets include goods movement carriers, long haul trucks, charter buses, and tourism buses. Owners would be offered four options: 1) use an engine certified to 0.1.g/bhp-hr PM, 2) use an engine certified to 0.1.g/bhp-hr PM plus a highest applicable verified diesel emission control strategy, 3) use an alternative fuel engine, or 4) apply verified diesel emission control strategy install hardware-based retrofit system. This is both a NOx control and a diesel risk reduction measure</p> <p><b>d) Heavy Duty Diesel Engine Software Upgrade</b> (also known as chip reflash or engine recalibration) Software upgrade installations reduce NOx emissions from trucks, school buses, and motor homes. Under California’s voluntary program, engine manufacturers have agreed to provide, at no charge, low NOx software for heavy-duty diesel vehicles with certain 1993 through 1998 model year engines. These vehicle owners are encouraged to install the low NOx software to reduce "off-cycle" emissions. "Off-cycle" NOx</p>	<p>2004</p> <p>2004</p> <p>2006</p> <p>2004</p>

	Strategy	Proposed Date for Board Consideration
	<p><b>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</b></p> <p>emissions are greater than the emissions allowed in the engine certification process. The voluntary program goals for software installation are: 1) 35% of California registered HDD vehicles by November 2004, 2) 60% by June 2005, 3) 80% by February 2006, and 4) 100% by 2008.</p> <p>If the Board determines that the voluntary program has not met the first goal by November 2004 or the progress does not appear sustainable, low NOx software installations will be required by a regulation. The regulation requires software upgrades to be installed between April 30, 2005, and December 31, 2006, depending on the model year of the engine. In general, the engine software upgrade reduces NOx emissions by eliminating advanced computer controls – “defeat devices” – that produce excess off-cycle NOx emissions during steady-state vehicle operation, such as on-highway driving. Engine manufacturers were required to develop and provide the software under federal Consent Decree/California Settlement Agreements.                      Note: This measure was adopted at the March 25, 2004 Board hearing.</p> <p><b>e) Engine Manufacturer Diagnostics</b>                      Would specify interim requirements for on-road heavy-duty diesel and gasoline engines to be equipped with diagnostic systems to detect malfunctions of the fuel system, exhaust gas recirculation system, and particulate matter trap. This is both a NOx control and a diesel risk reduction measure.</p> <p><b>f) On-Board Diagnostics (OBD)</b>                      Would require comprehensive OBD systems on on-road heavy-duty diesel vehicles to detect malfunctions of virtually every component that can cause emission increases before the emissions exceed a specified level. OBD requirements would also apply to new heavy-duty gasoline engines. This is both a NOx control and a diesel risk reduction measure.</p> <p><b>g) California Motor Vehicle Service Information Rule</b>                      The applicability of the existing rule was extended to heavy-duty vehicles, since ARB is currently in the midst of developing requirements for heavy-duty vehicles to be equipped with OBD systems. Requires vehicle manufacturers to make available all emission-related information about their vehicles, including service manuals, technical</p>	<p></p> <p>2004</p> <p>2005</p> <p>2004</p>

	Strategy	Proposed Date for Board Consideration
	<p><b>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</b></p> <p>service bulletins, OBD II descriptions, and diagnostic tools for 1996 and later model years. The majority of this information must be made available for download from the Internet.                      Note: The applicability of this rule was extended at the January 22, 2004 Board hearing.</p> <p><b>h) Manufacturer-Required In-Use Vehicle Testing</b>                      Would require heavy-duty engine manufacturers to in-use test a specific number of engines per engine family the manufacturer procured at various mileage intervals. If vehicles do not meet applicable emission standards (including PM and NOx), an engine recall may be required. The program would also include mechanisms to streamline the engine certification process to ease manufacturer’s engine testing burden. A fully implemented and enforceable manufacturer-run in-use compliance program will meet both ARB and U.S. EPA requirements.</p> <p><b>i) Reduced Idling of New Heavy Duty Diesel Trucks</b>                      Would require engine manufacturers to install an idle shutdown system that automatically turns the engine off after 5 minutes of continuous idle operation. Would apply to 2007 and later model year new heavy-duty diesel engines and vehicles. The system must be tamper resistant and non-adjustable. Would allow the use of alternative idle reduction devices/strategies in order to provide heating and air conditioning for cab comfort, engine oil heating for easy engine start-up in cold ambient conditions, and electric power to charge batteries and for on-board accessories. Such devices include an automatic stop-start system, on-board auxiliary devices such as fuel- fired heaters and auxiliary power units, and truck stop electrification equipment. This is both a NOx control and a diesel risk reduction measure.</p> <p><b>j) Reduced Idling of In-Use Heavy Duty Diesel Trucks</b>                      Would limit idling off all vehicles with 10,000 pounds gross weight to 5 minutes per location (school bus idling is regulated under a previously adopted diesel PM air toxic control measure). Idling limits would become effective until December 31, 2008 for vehicles equipped with sleeping berths at times when berthing is used for resting or sleeping. Idling is limited to 5 min for all buses in transit without passengers and to 10 minutes before passenger boarding. When passengers are on board a bus, for passenger comfort, idling limits would not apply. This is both a NOx control and a diesel risk reduction measure.</p>	<p>2005</p> <p>2004</p> <p>2004</p>

	Strategy	Proposed Date for Board Consideration
	<p><b>Pursue Approaches to Clean Up the Existing and New Truck /Bus Fleet (continuation)</b></p> <p><b><i>k) Transport Refrigeration Units (TRU) Toxic Air Control Measure</i></b>                      Requires in-use TRU engines that operate in California to meet specific performance standards that vary by horsepower range. The performance standard requirements are based on proposed Tier 4 emission standards for non-road engines and will be phased in from 2008 through 2020. The requirements can be met by retrofitting TRU engines with certified retrofit technology or replacing the engines, replacing entire units, or by using approved alternative technologies such as electrification or cryogenic refrigeration systems. The ARB is scheduled to conduct technology reviews in 2007 and 2009 to ensure that technologies are ready to meet the performance standard compliance schedule.                      Note: This measure was adopted at the February 26, 2004 Board hearing.</p>	2004
<b><i>Off-Road Engine and Vehicle Measures</i></b>		
4.	<p><b>Lower Emission Standards for New Off-Road Engines</b>                      (PM, NOx)                      U.S. EPA has proposed a 4<sup>th</sup> Tier of diesel exhaust standards, which will require the use of aftertreatment technology and 15 ppm sulfur diesel fuel for most off-road engines in the 2011-2015 time frame. ARB intends to adopt similar standards for California's off-road diesel engines after the U.S. EPA rule has been finalized.</p>	2004
5.	<p><b>Pursue Approaches to Clean Up the Existing Heavy-Duty Off-Road Equipment</b>                      (PM10, PM2.5, NOx, ROG)                      Strategies that operators select would have ARB-verified emission reductions or involve use of ARB certified engines and must meet the emission reduction targets specified by the rules. Strategies that operators could potentially use to reduce PM emissions include installation of hardware-based retrofits (e.g., diesel particulate filters or DPFs), replace older, dirtier engines with new certified ones (engine re-power), retire old vehicles/equipment or replace with new lower-emissions models. Depending on the strategy chosen, use of low-sulfur diesel may be an integral strategy component.</p>	2005-2006

	<b>Strategy</b>	<b>Proposed Date for Board Consideration</b>
6.	<p><b>Portable Engines Air Toxic Control Measure</b> (PM, NOx) Requires all portable engines 50 hp and larger to be certified to Tier 1, 2, or 3 U.S.EPA/ARB off-road engine standards by 2010, and meet more stringent fleet-average emissions limits in 2013 and 2017. In 2020 all engines must meet Tier 4 standards or use diesel retrofits that achieve 85% diesel PM emission reductions. The ATCM also aims to achieve NOx reductions through expedited engine replacement. <b>Note:</b> This measure was adopted at the February 26, 2004 Board hearing.</p>	2004
7.	<p><b>Implement Registration and Inspection Program for Existing Off-Road Equipment</b> (PM10, PM2.5, NOx) As ARB develops off-road control measures to reduce in-use emissions (including PM and NOx), registration and inspection programs will be incorporated as a component of each regulation. The most cost-effective registration and inspection programs would be tailored to the type of equipment, application, and type of control proposed. These programs are a means of ensuring that the chosen control strategies remain effective over the lifetime of the engine or equipment.</p>	2006-2009
8.	<p><b>Set Lower Emission Standards for New Off-Road Non-Preempt Gas Engines</b> (NOx, ROG) Would adopt exhaust emission standards for new non-preempted engines, in alignment with the federal Tier 2 standards beginning with the 2007 model year. In 2002, U.S. EPA adopted these emission standards based on catalyst durability testing co-sponsored by U.S. EPA, ARB, and the South Coast Air Quality Management District.</p>	2004-2005
9.	<p><b>Clean Up Existing Off-Road Gas Equipment Fleet</b> (NOx, ROG) Would reduce emissions from both existing and new large spark-ignition (LSI) engine fleets through a multi-faceted approach including: 1) retrofit of existing engines to achieve an 80% reduction in exhaust emissions or meet emission levels equivalent to 3.0 g/bhp-hr HC+NOx (the retrofit technology would include a three-way catalyst and, on some engines, closed loop fuel control systems) and 2) new emission standards to increase use of near-zero and zero-emission forklifts (e.g., electric forklifts).</p>	2004

	<b>Strategy</b>	<b>Proposed Date for Board Consideration</b>
10.	<p><b>Pursue Approaches to Clean Up the Existing Harborcraft</b> (PM10, PM2.5, NOx, ROG) Emissions reduction options for in-use harbor craft engines (commercial marine vessels) would include: 1) use of add-on control equipment (e.g., DPF, diesel oxidation catalyst (DOC), selective catalytic reduction (SCR), or a combination of systems), 2) repowering of existing vessels or early introduction of new vessels, and 3) use of cleaner fuels such as California on-road low sulfur diesel, emulsified diesel fuels, biodiesel, compressed natural gas, or liquefied natural gas. Due to the diversity within the harbor craft category, specific emission reduction proposals may vary with the type of vessels, industry, or other factors.</p>	2004-2005
11.	<p><b>Pursue Approaches to Reduce Land-Based Port</b> (PM10, PM2.5, NOx, ROG) Strategies to reduce PM, NOx, and ROG emissions may include: 1) early introduction of cleaner new vehicles and equipment, 2) expanded use of alternative fuels, 3) repowering with cleaner new engines, 4) add-on control equipment, 5) electrification of diesel equipment, 6) public education programs, and 7) operational changes such as idling limits.</p>	2004-2005
<b>Fuels</b>		
12.	<p><b>Set Additives for Diesel Fuel to Control Engine Deposits</b> (PM10, PM2.5, NOx, ROG, CO) Would require the use of deposit control additives in diesel fuel. The fuel would be certified upon passing engine tests that demonstrate that the fuel keeps injectors, cylinders, valves, and other engine parts free of combustion deposits.</p>	2006-2009
<b>Stationary and Area Sources</b>		
	<b>Strategy</b>	<b>Proposed Date for Board Consideration</b>

13.	<p><b>Stationary Diesel Agricultural Engine Air Toxic Control Measure (ATCM)</b>                  ARB is working with the air districts and the agricultural community to develop an ATCM that will reduce diesel PM emissions from existing stationary compression ignition engines used in agricultural operations.</p>	2005
	<b>Strategy</b>	<b>Proposed Date for Board Consideration</b>

<p>14.</p>	<p><b>Stationary Compression Ignition Engines Air Toxic Control Measure</b></p> <p>Stationary diesel engines remain in one location at a facility for more than 12 months. Sets emission standard requirements, operating hour limitations, fuel requirements, and record-keeping/reporting requirements for new (installed after 1/1/05) and existing (installed before 1/1/05) stationary diesel-fueled compression ignition engines.</p> <ul style="list-style-type: none"> <li>- The new and existing prime (non-emergency) engines (e.g., remote power generation, cranes, sand and gravel processing, and fluid pumping) must meet a stringent PM standard of 0.01 g/bhp-hr beginning in 2005.</li> <li>- New emergency standby engines (e.g., provide power during power outage, emergency pumping of water during floods or fire suppression, or power airport runway lights under low visibility) must meet a PM standard of 0.15 g/bhp beginning in 2005. Existing emergency standby engines must limit maintenance and testing hours depending on the baseline emission level of the engine beginning in 2005.</li> <li>- New stationary diesel engines used in agricultural operations must limit PM emissions to 0.15 g/bhp-hr beginning in 2005.</li> <li>- To control criteria pollutants, all of these engines must meet the Off-Road Compression Ignition Engine Standards applicable to engines of the same size and model year.</li> <li>- Also sets requirements for demand response programs, remotely located engines and emergency standby engines located near schools.</li> </ul> <p>Note: This measure was adopted at the February 26, 2004 Board hearing</p>	<p>2004</p>
	<p><b>Strategy</b></p>	<p><b>Proposed Date for Board Consideration</b></p>

<p>15.</p>	<p><b>Set New Consumer Products Limits in 2004, 2006, and 2008</b> (ROG) Would target previously unregulated categories or regulated categories that ARB staff has not evaluated for further emissions reductions during the last five years. Additional reductions may be achieved through both mass-based and reactivity-based limits. Products under evaluation include various unregulated solvent categories that may contain up to 100% ROG and many of the smaller regulated or currently unregulated categories of consumer products. To adopt new limits for consumer products in 2006 and 2008, ARB staff will need to update inventories detailing product ingredients and product sales by conducting surveys in 2004 and 2006.</p>	<p>2004</p>
<p>16.</p>	<p><b>Increase Recovery of Fuel Vapors from Aboveground Storage Tanks</b> (ROG) Would apply as many of the current enhanced vapor recovery (EVR) standards as feasible to gasoline aboveground storage tanks (ASTs), including an increase in overall system efficiency from 90 to 95% vapor recovery. Current EVR regulations, including Phase I regulating gasoline transfer from cargo tank to dispensing facility storage tank, and Phase II regulating transfer from the dispensing facility to the motor vehicle apply to underground storage tanks, do not apply to ASTs. The regulation would address the increasing number of AST dispensing systems used at private and public facilities and some retail sites.</p>	<p>2004-2005</p>
<p>17.</p>	<p><b>Reduce Fuel Permeation Through Gasoline Dispenser Hoses</b> (ROG) Would review current permeation requirements for gasoline dispenser hoses and, if feasible, establish lower permeation requirements. Gasoline dispensing hoses used at marinas have stricter standards for hose permeability due to water quality concerns. The goal of this measure is to determine the applicability of the permeability standard for marine gasoline hoses to dispenser hoses at service stations.</p>	<p>2005</p>

**References:** <http://www.arb.ca.gov/planning/sip/stfed03/stfed03.htm>  
<http://www.arb.ca.gov/diesel/dieselrrp.htm>  
<http://www.arb.ca.gov/diesel/documents/rrpapp.htm>