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Board Agenda Item

TO: Air Pollution Control District Board

FROM: Douglas W. Allard, Air Pollution Control Officer

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SUBJECT: Marine Shipping Retrofit Program

RECOMMENDATION:

1. Receive a briefing on APCD's activities to reduce emissions from marine shipping.
2. Approve participation in a Marine Shipping Retrofit Program using up to \$100,000 in Innovative Technologies Group Funds.

DISCUSSION:

In November 2001, your Board adopted the 2001 Clean Air Plan. The plan identified marine shipping as a major contributor to our existing emissions and as an emission source that is anticipated to grow substantially in future years. Your Board directed staff to "take aggressive actions to influence the United States Environmental Protection Agency (EPA) to reduce the air quality impacts of emissions from marine shipping." In an update to your Board in April 2002, we discussed the fact that much of the effort to reduce emissions from the marine shipping is focused on new ships and emissions at ports. Therefore, we presented our plan to reduce emissions from the existing fleet by participating in and promoting retrofit programs. We have titled this effort the "Marine Shipping Retrofit Program" (MSRP) and are seeking formal approval for the program today.

In Santa Barbara, the emission inventory developed for our 2001 Clean Air Plan indicated that marine vessel nitrogen oxide (NOx) emissions were on the order of 27 tons per day, roughly equivalent to emissions from our County's on-road vehicles and about a third of our County's total NOx emissions. (NOx is one of the two pollutants that react to form ozone.) Due to the fact that a number of vessels routinely make a Pacific Rim circuit, over 40 individual vessels

emit in excess of 50 tons each of NO_x off the Coast of Santa Barbara County each year. Worse yet, total marine shipping NO_x emissions will grow by about two-thirds to about 60% of our total NO_x inventory by 2015, due to the combination of increases in vessel traffic and continued reductions in land-based emissions. This emissions growth will make it increasingly difficult to meet air quality standards in Santa Barbara.

We have worked on several fronts to try to encourage the reduction of emissions from marine shipping. As a result, we have raised this issue in importance throughout the state and in the eyes of the federal government as well. Santa Barbara County is now widely known as a staunch proponent of actions to reduce vessel emissions. Specifically, we are active participants in the California Air Resources Board's Marine Shipping Working Group. We have provided written and oral testimony on the U.S. EPA's rulemaking to control large engines that power ocean-going vessels. We encouraged your Board to send a letter to the Chair and the Ranking Member of the Senate's Foreign Relations Committee urging the ratification of Annex VI (Regulations for the Prevention of Air Pollution from Ships). This treaty is now before the Senate Foreign Relations Committee where it is being considered for ratification. It has been ratified by 11 countries representing 54 percent of the world's tonnage.

Since our last update to your Board, we have worked on the following tasks:

- Updated our marine shipping emissions inventory with 2002 data and will soon update it with the 2003 data.
- Provided testimony at an Air Resources Board hearing to gain support and recognition of the need for action to reduce emissions from the largely uncontrolled source.
- Published and presented a paper, titled "The Need to Reduce Marine Shipping Emissions: A Santa Barbara Case Study" at the Annual Air and Waste Management Association conference in San Diego.
- Published a marine shipping emissions webpage that can be viewed at <http://www.sbcapcd.org/itg/shipemissions.htm>.
- Worked with ARB and other partners in an effort to develop and standardize an emissions testing protocol.
- Continued the evaluation of potential control technologies.
- Continued to develop partnerships with funders and shippers interested in participating in a retrofit-technology demonstration project.

Funding Status

On May 23, 2003, we sent a letter to air pollution control districts throughout the state to encourage participation in a multi-agency effort to reduce emissions from ocean-going vessels. We have also developed a fact sheet (Attachment 1) that provides information about this program for potential funding partners. Funding for this demonstration program is critical to attracting the interest of control technology vendors and emissions testing contractors. Our goal, in a multi-agency effort, is to raise \$1,000,000 toward this project, with half of that obtained by December 2003. The Department of Transportation's Maritime Administration (MARAD), ARB, EPA, port authorities, and several air districts that will benefit from reduced shipping

emissions have already indicated their intent to contribute funding and we expect to meet our \$1,000,000 goal.

To date, a total of \$295,000 in funding has been formally allocated for a demonstration project by the Bay Area Air Quality Management District (\$285,000) and the San Luis Obispo Air Pollution Control District (\$10,000). We understand that Ventura County APCD staff will be recommending that their Board allocate \$50,000 toward this effort and that the U.S. EPA has allocated \$150,000. As part of our commitment to this effort, we recommend that your Board authorize \$100,000 in funding for this demonstration program as outlined in the next section. These funds were included in our FY03/04 budget.

Marine Shipping Retrofit Program

The near-term goal of this program is to reduce NOx emissions from two or three ships passing Santa Barbara County using cost-effective emission reduction technologies that can be adaptable to other ships. We will focus on ships that emit significant amounts of NOx offshore our area and on emission technologies that are chosen by the ship owner-operators. Our long-term goal is to document the performance of emission reduction technologies and other information to promote additional programs, projects, and potential incentives to reduce emissions from the ships that travel along our coastline.

The Marine Shipping Retrofit Program (MSRP) has five objectives that include:

1. Improve our understanding of ship activities and emissions.
2. Evaluate potential control technologies
3. Develop partnerships and funding mechanisms.
4. Implement retrofit technologies
5. Document results

We have made significant progress on our first two objectives and are actively engaged in the third objective to develop partnerships and funding mechanisms.

The funding that we are recommending your Board allocate to the MSRP will be subject to the following criteria:

- Total program funds not to exceed \$100,000 (at this time).
- Cost-effectiveness shall not exceed \$13,600/ton NOx reduced for technology installation.
- Retrofit technologies must have wide application potential.
- Retrofit candidates must operate offshore of Santa Barbara County.
- Project funds must be used for important elements of the retrofit demonstration such as engine control hardware, fuel modification, and emissions testing.
- Funding must be provided through standard grant agreements and procedures used by the district or through a memorandum of understanding among project partners.

If your Board authorizes ITG staff to implement the MSRP, we will bring future grants agreements and/or MOU's to your Board for approval as they are developed.

FISCAL IMPACT:

Funds for this Marine Shipping Retrofit Program will be taken from the Chevron Trust Funds. No taxpayer or general permit fees will be used to fund this program. The expenditure appropriation for this program was included in the FY03/04 budget, budget unit 873, account 7460 (professional services).

Attachment 1



The Need for a Marine Shipping Retrofit Program — And How California Air Districts Can Help Make it Happen

The Problem

Emissions from marine shipping significantly impact air quality in California, and threaten the ability of areas in the state to attain standards. Coastal regions are affected by emissions along the coast, and in concentrated urban areas near ocean ports. Inland areas are affected by transport of emissions from upwind areas on the coast, and by emissions along inland rivers, and at inland ports.

Marine shipping air emissions have been largely unregulated, and the vessels are growing in number and size—even as the heavy fuel oil they use is degrading in quality. Left uncontrolled, marine shipping emissions will continue to grow, essentially negating reductions from onshore emissions sources in areas such as Santa Barbara County.

Isn't this a federal issue?

Long-term, standards for marine vessels must be implemented through national leadership and international cooperation. However, even if stringent standards were implemented for new ship engines immediately (an unlikely best-case scenario), California would not reap the benefits for many years. Emissions must be reduced from the existing fleet. Initially, a demonstration program could provide the information and experience needed to lay the groundwork for a comprehensive, incentive-based program along the lines of the successful Moyer program, which could attract additional federal funding.

What is envisioned for the program? And who is involved?

The California Air Resources Board Maritime Working Group, made up of participants from California air districts, the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Transportation's Maritime Administration (MARAD), environmental groups, ship owner-operators, engine manufacturers, and control technology vendors, is working to develop the program.

Initially, the plan is to retrofit two to five ocean-going vessels over two to three years, adding more projects if additional federal funding follows the demonstration of the retrofits' viability. Management and participation in the initial projects would vary depending on the areas participating. Technologies and strategies under consideration to reduce both nitrogen oxides and particulate matter emissions include emulsified fuels, water injection, humidification, selective catalytic reduction and others. Extensive emissions testing will be conducted before and after installation of controls to develop valuable (and not currently available) operational information and to verify emission reduction goals.

(see reverse)

How much will the program cost, who will pay for it, and what are the objectives?

The Maritime Working Group has set an initial target of one million dollars for the initial demonstration program. California air districts are being asked to contribute whatever resources they can to the program; one air district has already committed close to \$300,000. We anticipate that additional funding will follow from participating ports, the U.S. EPA, and “in-kind” staff resources from MARAD.

The five principal objectives of the program are as follows.

1. Improve our understanding of ship activities and emissions.
2. Evaluate potential control technologies.
3. Develop partnerships and funding mechanisms.
4. Implement retrofit technologies.
5. Document results.

What is the potential cost effectiveness?

Due to the huge volume of emissions produced by these vessels, retrofit projects should easily be able to meet the \$13,600 cost/ton limit identified in the Carl Moyer Program, and it’s likely they could go well below that level. Control technologies are available that can cost-effectively reduce these emissions by 10-30 percent or more.

Who is likely to participate?

Under the umbrella of the Maritime Working Group, a number of owner/operators, agencies, and ports have shown interest in the demonstration project. These include: Matson, BP, Maersk, MARAD, the U.S. Environmental Protection Agency, California Air Resources Board, the Ports of Long Beach and Los Angeles, the U.S. Navy, several air pollution control districts, technology providers, and emission testers.

How do potential Emission Reduction Credits (ERCs) factor into this program?

All District funding provided for the demonstration projects will go to clean air – no ERCs will be generated. However, ERC programs could be considered in the future providing that U.S. EPA requirements are met.

What is the next step if a California air district is interested in joining the program?

This first step is to take an active role in the Maritime Working Group. To join, please go to www.arb.ca.gov/mspros/offroad/marinevess/maqtws.htm and contact the Air Resources Board to sign up! District boards are also encouraged to allocate available funding for the program in order for us to understand the total amount of resources available. As project specifics are worked out, district boards will then be asked to approve specific grant agreements or enter into a Memorandum of Understanding.

For more information on marine shipping emissions issues, visit www.sbcapcd.org