

MERCURY EMISSIONS AND ELECTRIC UTILITIES

February 24, 1998

EPA is today issuing a Report to Congress on emissions of hazardous air pollutants from power plants that identifies electric utilities as the largest remaining source of mercury emissions to the air. EPA has a five-pronged approach to controlling mercury emissions from power plants. The approach includes:

- ◆ increasing public access to information concerning mercury emissions from power plants
- ◆ seeking to reduce risk to highly exposed populations through public information
- ◆ making maximum use of the reductions in mercury emissions that can be achieved from controlling other pollutants
- ◆ encouraging the development of mercury emissions monitoring and control technologies
- ◆ further research to increase our understanding of the nature and fate of mercury emissions from power plants so as to form a basis for future controls

EPA already has taken steps to reduce mercury emissions from three other significant industry sources. The Agency issued final regulations cutting mercury emissions from municipal waste combustors in 1995 and from medical waste incinerators last August. Later this year, EPA will announce a final rule to reduce mercury emissions from hazardous waste combustion. These actions, once fully implemented, will reduce mercury emissions caused by human activities by over 50% from 1990 levels.

Background

Mercury moves through the environment as a result of both natural and human activities. The human activities that are chiefly responsible for causing mercury to enter the environment are burning mercury-containing fuels and wastes, and industrial manufacturing processes. Mercury emissions are transported through the air and deposited to water and land where humans and wildlife are exposed. Based on the emissions inventory in EPA's Mercury Study Report to Congress (December 1997), the highest emitting source category is coal burning electric utilities. This group of sources account for one-third of the anthropogenic (caused by human activity) emissions to the air in the US.

Concentrations of mercury in air are usually low and of little direct concern. Once mercury enters waters, either directly or through air deposition, it can bioaccumulate in fish and animal tissue in its most toxic form, methylmercury. Bioaccumulation means that the concentration of mercury in predators at the top of the food web (for example, predatory fish and fish-eating birds and mammals) can be thousands or even millions of times greater than the concentrations of mercury found in the water.

Human exposure to mercury occurs primarily through eating contaminated fish. Exposure to high levels of mercury has been associated with serious neurological and developmental effects in humans. Depending on the dose, the effects can include subtle losses of sensory or cognitive ability, tremors, inability to walk, convulsions, and death. Because the developing fetus may be

the most sensitive to the effects from methylmercury, women of child-bearing age are regarded as the population of greatest interest.

People who consume average amounts of a variety of commercially available fish as part of a balanced diet are not likely to consume harmful amounts of mercury. Moreover, fish is an excellent source of proteins, vitamins and minerals and including a variety of fish in the diet is a healthy dietary practice. The levels of methylmercury found in the most frequently consumed commercial fish are low, especially compared to levels that might be found in some non-commercial fish from fresh water bodies that have been affected by mercury pollution. While most U.S. consumers need not be concerned about their exposure to methylmercury, some exposures may be of concern. Those who regularly and frequently consume large amounts of fish -- either marine species that typically have much higher levels of methylmercury than the rest of seafood, or freshwater fish that have been affected by mercury pollution -- are more highly exposed.

The greatest exposure and risk exist for those persons who regularly eat large amounts of fish from a single location which has been impacted by mercury pollution, particularly for women of child-bearing age. Everyone should follow established guidelines in accordance with existing state and tribal advisories on locally caught fish in order to reduce the potential risk of mercury exposure.

Mercury is the most frequent basis for fish advisories issued by States or Tribes, represented in 60% of all water bodies with advisories. They increased 28% from 1995 to 1996 (from 1,308 to 1,675). Thirty-nine states have advisories for mercury in one or more water bodies, and nine States have issues statewide mercury advisories.

Uncertainties

There is a good deal about the contribution of electric utilities to concentrations of mercury in fish that we do not yet know. There is a plausible link between anthropogenic releases of mercury from industrial and combustion sources in the United States and methylmercury in fish. However, these fish methylmercury concentrations also result from existing background concentrations of mercury (which may consist of mercury from natural sources, as well as mercury which has been re-emitted from the oceans or soils) and deposition from the global reservoir (which includes mercury emitted by other countries). Given the current scientific understanding of the environmental fate and transport of this element, it is not possible to quantify with precision how much of the methylmercury in fish consumed by the U.S. population is contributed by U.S. emissions from utilities relative to other sources of mercury.

Strategic Approach

EPA's approach to mercury emissions from power plants includes the following actions:

- **Emission controls for air point sources.** There are no control technologies for mercury that are commercially viable for utility boilers, but some may become available in a few years. In addition, there are strategies that do not rely on emissions control technologies but rather on more efficient use of fuels and switching to fuels that do not contain mercury. Actions that EPA is taking to control SO₂ and NO_x will cause modest reductions in mercury emissions as well. With implementation of the new National Ambient Air Quality Standards for fine particulate matter and ozone, and the second phase of the acid rain program, EPA expects to see a reduction of mercury emissions from utility boilers. Actions to reduce emissions of the greenhouse gases that are responsible for climate change, could substantially reduce mercury emissions from utilities and other industrial boilers. The Agency anticipates that as a result of both climate change policy and the new air standards, power plants will reduce mercury emissions both by switching to cleaner fuels and by using fuels more efficiently. In addition, EPA has taken several important steps to reduce emissions of mercury and other pollutants including reducing emissions from municipal waste combustors and medical waste incinerators. These actions, once fully implemented, will reduce mercury emissions caused by human activities by 50% from 1990 levels.
- **Water-related mercury actions.** EPA will revise its water quality criteria development plan, and the required analytical method for measuring mercury concentrations in water to be more sensitive (able to measure concentrations below the new criterion level) and less subject to sample contamination. Together, these changes will lead to more precise data on actual mercury levels in water. Additional work is being done in developing the total maximum daily load program to evaluate the linkage of air emissions to water quality impacts, to help determine appropriate reduction actions.
- **Providing the Public Access to Information.** Last year, the categories of industrial facilities required to report for TRI were expanded to cover, electric utilities, among others. However few utilities need to report on mercury releases because reporting thresholds are above what most utilities emit. In order to ensure that reporting on mercury to TRI will effectively provide citizens meaningful information on mercury releases from utilities or other sources, EPA is preparing a proposal to lower the reporting threshold for mercury.
- **Seek reduction in exposure to highly exposed populations.** Because of the long time before reductions in releases will be reflected in lower fish-tissue levels, EPA will continue public information and outreach programs, including continued support and strengthening of the States' and Tribes' fish advisory programs.
- **Further research on all aspects of the mercury problem.** EPA, in cooperation with the greater scientific community, will develop and implement an EPA research/monitoring

plan. The plan will build on ongoing research efforts in the areas of mercury fate and transport modeling and monitoring, assessment methods development for health and ecological impacts, and assessment of new mercury control technologies.

For additional information on EPA action to control mercury see the Mercury White Paper at <http://www.epa.gov/airlinks>.