NIOSH Comments to EPA

COMMENTS ON EPA PROPOSED RULE: POLYCHLORINATED BIPHENYLS (PCB's); MANUFACTURE, PROCESSING, DISTRIBUTION IN COMMERCE AND USE PROHIBITIONS: USE IN ELECTRICAL TRANSFORMERS

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The National Institute for Occupational Safety and Health (NIOSH) established under the Occupational Safety and Health Act of 1970 is charged, in part, to conduct research and workplace investigations. The results of these activities are used by NIOSH to make recommendations for improved standards for occupational safety and health. Consistent with this charge, NIOSH has investigated several incidents of fires involving transformers containing polychlorinated biphenyls (PCB's). One of these fires occurred at the First National Bank Building in Chicago, Illinois, and another occurred in an office building in Binghamton, New York. Investigations of sudden releases of PCB-containing transformer fluid have also been conducted. Since 1981 NIOSH has investigated more than 15 incidents involving PCB-containing electrical equipment. Four of these incidents are described in EPA's proposed rule.

NIOSH is particularly concerned about the potential health risks encountered by workers who must respond to these emergencies and those who must clean up areas contaminated by PCB's, polychlorinated dibenzodioxins (PCDD's), and polychlorinated dibenzofurans (PCDF's). Therefore, NIOSH supports EPA's proposed rule which is intended to reduce the health risks associated with such exposures.

Elimination of PCB's from transformers will provide the most effective long term solution to the problem. We believe that the actions proposed by EPA will help to reduce the health risks posed by those PCB-containing transformers still in use. While the proposed rule is basically sound, some clarification of the information concerning those incidents which NIOSH investigated is required. We also suggest improvements for several provisions of the proposed regulation.

Indoor Fires

The proposed rule notes the lack of data that describe the formation of PCDF's or PCDD's following the transformer fire at the First National Bank Building in Chicago, Illinois, in September 1983. NIOSH investigated that incident and obtained some data that may provide some indication of the extent to which these substances can be formed. A wipe sample of soot that resulted from the fire was obtained from the vault ceiling and was analyzed at Wright State University. The analysis revealed that the sample contained a total of 28,000 nanograms (ng) of tetrachlorodibenzofurans per 100 cm^2, 40,000 ng of pentachlorodibenzofurans per 100 cm^2, and 33,000 ng of hexachlorodibenzofurans per 100 cm^2. Only 127 ng per 100 cm^2 of octadibenzodioxins were detected. Analysis of a sample of the original transformer fluid revealed 230 ppb (230 ng/g) of tetrachlorodibenzofurans and only small amounts of the penta-, hexa-, and octa-dibenzofurans.

Firefighter Exposures

Generally speaking, the exposures to PCB's and related substances experienced by firefighters and others responding to these incidents or cleaning up afterwards have been difficult to quantitate. Due to the relative insensitivity of the analytical method and the background concentrations of these substances, data obtained from biological monitoring of exposed individuals are difficult to interpret. However, following the fire in Binghamton, New York, biological monitoring of firefighters and cleanup workers revealed that they had a small but statistically significant increase in their serum PCB concentrations as a result of their exposure.

Samples from the protective clothing and equipment used by the firefighters in Binghamton were found to be contaminated and, therefore, presented the potential for exposure to PCB's and related substances even after they left the scene of the fire. For example, analysis of samples following solvent extraction of the protective clothing and equipment used by firefighters responding to an incident in Miami revealed PCB concentrations of between 2.7 and 72 ug/g of clothing. Data obtained by NIOSH from incidents in St. Paul, Minnesota, and Rockford, Illinois, also demonstrated PCB contamination of protective equipment and clothing, further highlighting the potential for PCB exposure during and after emergency activities associated with such incidents.

Outdoor Fires

Most of the provisions of EPA's proposed rule are limited to transformers located in or near buildings. NIOSH believes that EPA should also include outdoor transformers in the rule. Although the potential for exposure of the general population is smaller, the potential for significant exposure of firefighters and other emergency personnel remains. For example, NIOSH is currently investigating a fire at one electrical power substation near Columbus, Ohio, that used PCB-containing electrical capacitors. Up to 1,000 ng of 2,3,7,9-TCDF per 100 cm^2 and up to 3.0 ng of 2,3,7,8-TCDD per 100 cm^2 were found in the soot that resulted from that fire. More than 20 firefighters were exposed to these substances at this fire.

Vaporization of PCB's from Transformers

EPA's proposed rule is limited to transformer fires. However, NIOSH is also concerned about the potential for PCB exposure from transformers that overheat and release PCB-containing fluid through the transformer's pressure release valve. NIOSH investigated such an incident at a Minnesota school. Our investigators found that about 50 gallons of transformer fluid had been released. This particular fluid contained 45% PCB's, thus about 22.5 gallons of PCB's were released. We have enclosed a copy of that report.

Even though significant amounts of PCDF and PCDD do not appear to result from this type of incident, the potential for a significant exposure of emergency and cleanup personnel to PCB's and chlorinated benzenes does exist. NIOSH is aware of two similar incidents that have occurred in New York State. In one situation that occurred at a school, the magnitude of the PCB contamination of the hallway near the transformer vault was not fully appreciated for several years. The second case of fluid release due to transformer overheating and subsequent pressure release occurred at an office building in Syracuse, New York, and was similar to the situation of the Minnesota school described above. Based upon our investigations and our concern for the potential health risks to workers who clean up such spills and the general public which may be incidentally or directly exposed, NIOSH recommends that the EPA rule also address this type of incident.

Registration with Fire Departments

Based on our experience with these incidents, NIOSH recommends that all PCB-containing transformers be registered with the appropriate fire department. This registration along with improved marking of PCB transformer locations will greatly assist fire departments in providing appropriate protection for firefighters responding to these incidents. For example, as a result of their involvement with an earlier PCB transformer fire, the Miami Fire Department developed procedures for minimizing exposures of their firefighters. When they had to respond to the next transformer fire, the department was able to implement these procedures. Recent media accounts of PCB incidents in Tulsa, Oklahoma, and New York, New York, also indicate the prompt implementation of similar procedures.

Notification of the National Spill Response Center

While NIOSH agrees with the provision for notifying the National Spill Response Center prior to initiating cleanup efforts, we urge that local and state health departments should be simultaneously notified. Our experience with these incidents indicates that there is often initial uncertainty over which governmental agency should oversee evaluation of potential building contamination and subsequent cleanup efforts. The local or state health departments must often assume this responsibility. Prompt notification of these agencies would assist in assuring appropriate protection of the public's health.

In summary, NIOSH supports EPA's proposed rule regarding PCB transformers and believes that implementation of these regulations will significantly reduce the potential health risks from incidents involving transformers which contain PCB's. We have suggested changes in the rule that we believe will improve its effectiveness. If we can provide any further information regarding some of the incidents mentioned in these comments, please contact us.

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16. Abstract (Limit: 200 words) This testimony concerns the investigation by NIOSH of several fires involving transformers containing polychlorinated biphenyls (PCBs). One such fire occurred at the First National Bank Building in Chicago, Illinois and another in an office building in Binghamton, New York. Since 1981, NIOSH has investigated more than 15 incidents involving electrical equipment containing PCBs. NIOSH contends that the elimination of PCBs from transformers will provide the most effective long term solution to the problem. While the proposed rule of the Environmental Protection Agency is sound, some clarification of the information concerning those incidents which NIOSH investigated is required. Topics covered in this testimony include indoor fires, firefighter exposures, outdoor fires, vaporization of PCB's from transformers, registration with fire departments, and the notification of the National Spill Response Center.

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