

DOCUMENT RESUME

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[Exposure of Naval Regional Medical Center Personnel to Toxic Substances]. HRD-77-117; B-163375. July 5, 1977. 6 pp.

Report to Secretary, Department of Health, Education, and Welfare; by Gregory J. Ahart, Director, Human Resources Div.

Issue Area: Consumer and Worker Protection: Standards, Laws, and Regulations Enforcement (903).

Contact: Human Resources Div.

Budget Function: Health: Prevention and Control of Health Problems (553).

Organization Concerned: Department of Defense; Department of Labor; National Inst. for Occupational Safety and Health.

Congressional Relevance: House Committee on Education and Labor; Senate Committee on Human Resources.

Authority: Occupational Safety and Health Act of 1970 (29 U.S.C. 658). 29 C.F.R. 1910.1000.

The deaths from leukemia of two employees who worked in the powerhouse of the Naval Regional Medical Center in Portsmouth, Virginia, could have been work-induced. Findings/Conclusions: The powerhouse uses "number 6" fuel oil containing benzene and other contaminants. While a cause and effect relationship was not posited, benzene has been known to cause leukemia. Number 6 fuel is used by several Federal agencies, and probably by private industry, in power generation and steam-heating plants. Use of this fuel could cause dangerous exposure of employees if appropriate safeguards are not taken. Recommendations: The Department of Defense should investigate this hazard with the assistance of the National Institute for Occupational Safety and Health (NIOSH). NIOSH should also assess the potential for exposure to toxic substances in residual fuel oils at other Federal agencies and in private industries. (DJM)

Same as 2999-3000



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

02847

HUMAN RESOURCES
DIVISION

B-163375

JUL 05 1977

The Honorable
The Secretary of Health, Education,
and Welfare

Dear Mr. Secretary:

We have been evaluating whether selected Federal civilian and military installations provide adequate protection to workers exposed to toxic substances. During the course of our evaluation we visited several installations, including the Naval Regional Medical Center in Portsmouth, Virginia. Our evaluation included work area inspections with an industrial hygienist from the Department of Labor's Occupational Safety and Health Administration (OSHA). Discussions with installation officials, supervisors, and employees; and reviews of records.

Through discussions with Medical Center personnel we became aware of the leukemia-induced deaths of two Medical Center employees who had worked in the Center's powerhouse, which uses "number 6" fuel oil. Officials from the National Institute for Occupational Safety and Health (NIOSH) said that benzene and other toxic substances are contaminants in residual fuel oils, including number 6 fuel. Officials from the Defense Logistics Agency (DLA) said that the amounts of these substances will vary among batches and the benzene in the fuel oil could amount to as much as 1/2 of one percent by weight. NIOSH officials said that benzene has been known to cause leukemia.

Although we are not concluding that there was a direct relationship between exposure to benzene or the other toxic substances which may be found in number 6 fuel and the two leukemia-induced deaths, we believe the evidence on the adverse effects of benzene alone is enough to warrant prompt attention to this matter. DLA officials said that the Department of Defense (DOD) and several Federal civilian agencies use significant amounts of number 6 fuel at various locations. Use of this fuel could cause dangerous exposure of employees if appropriate safeguards are not taken.

This matter has been brought to the attention of the Secretary of Defense. We recommended that the Secretary of Defense, with NIOSH'S assistance, look into the potential health hazards created by handling and using residual fuel oils which may contain benzene or other toxic substances. We are bringing this matter to your attention so that you can take appropriate action to help DOD determine the scope of the problem and minimize exposure of DOD employees to this hazard. Also, similar hazards may exist in other Federal agencies and private industry. NIOSH officials said that they would be interested in following up on this matter.

BACKGROUND

The powerhouse uses three oil-fired boilers to produce steam heat for the Naval Regional Medical Center. Number 6 fuel is stored in tanks adjacent to the powerhouse. Fuel is taken from these tanks, heated to 140 degrees Fahrenheit, pumped through filters, and heated to 210 degrees Fahrenheit before being sprayed into the firebox. (Number 6 fuel is very thick and must be heated before it can be used effectively.) Twelve employees currently work in the powerhouse, which operates 24 hours a day, 7 days a week. Powerhouse employees said that the physical plant and operation at the powerhouse have been basically the same for the past 30 years, and that number 6 fuel has been used for more than 20 years.

Both deceased employees worked in the Medical Center's powerhouse for over 20 years. The first employee died in July 1972 at age 66, a few weeks after retiring from Federal service. Medical Center personnel said that this employee was being treated by the Medical Center at the time of his death. The autopsy report shows the cause of death to be an acute intracerebral hemorrhage due to myelogenous leukemia. Regional Medical Center and Federal Record Center (St. Louis) officials said they had no medical records on this employee.

The second employee died in August 1975 at age 55. The autopsy report shows that this employee died of a cerebral hemorrhage due to thrombocytopenia resulting from subacute myelogenous leukemia. His widow has filed a workmen's compensation claim, alleging work-related death due to exposure to a toxic substance. In August 1973 a private physician, after examining this employee and reviewing his medical history, reported the possibility of bone marrow injury from a toxin such as benzene and the

possibility of exposure to hydrocarbons. Medical records show that leukemia was suspected at that time. Traces of benzene had been found in the employee's blood. In January 1975, the private physician diagnosed the illness as leukemia.

At the foreman's request, the second employee's work area was checked in 1973 by two Medical Center industrial hygienists. The foreman said that he had informed the hygienists that benzene had been found in the second employee's blood and that the hygienists were to survey the powerhouse for possible benzene exposure. The hygienists observed the work area and examined some of the substances used, and concluded that the second employee's problem was not due to exposure to chemical vapors in the work environment.

The hygienists' report makes no mention of testing for benzene and we found no evidence that air samples had been taken during the survey. One hygienist said that the fuel oil being used at that time was not tested. The oil was not suspected as a possible problem.

HAZARDS OBSERVED BY OUR
OFFICE AND OSHA HYGIENIST

The OSHA standard for occupational exposure to benzene is 10 parts per million (ppm) as an 8-hour time-weighted average with a ceiling of 25 ppm (29 C.F.R. 1910.1000). The standard does not include required work practices or other measures to protect workers. In May 1977 an emergency temporary standard for occupational exposure to benzene was to reduce the permissible workplace exposure to benzene from 10 ppm to 1 ppm, with a ceiling of 5 ppm for any 15-minute period during an 8-hour day. The emergency standard includes required work practices and other measures to protect workers. However, a court order temporarily stayed the effective date of the proposed emergency standard. As of June 29, 1977, the court order was still in effect.

Section 19 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 668) requires that Federal agencies have an occupational safety and health program which is consistent with OSHA standards.

In January 1977, at our request, an OSHA industrial hygienist surveyed the powerhouse and took air samples in the work areas. Also, a sample of the number 6 fuel was taken and analyzed for benzene. The air samples taken in the general working areas of the powerhouse showed that concentrations of benzene vapors in the air were less than

1 ppm. The OSHA hygienist said this low level was due to the ventilation produced by the boiler's air intake fans.

The air samples from inside the storage tanks showed concentrations of 60 ppm or more. The samples taken at the fuel filters inside the powerhouse showed concentrations exceeding 60 ppm--that is, the detection device became saturated immediately, indicating that the concentration exceeded 60 ppm, the maximum reading possible with the testing device used. These samples were taken to determine if benzene vapors were being emitted from the fuel oil. The fuel oil sample showed a concentration of about 1/10 of one percent by weight. The OSHA hygienist said such an amount, if released into the atmosphere, would far exceed the OSHA-established level for benzene exposure.

During our survey we observed a powerhouse employee cleaning the fuel filters used in the system. Cleaning was accomplished by filling a metal bucket with fuel oil and cleaning the filter by hand in the bucket. The employee wore no gloves or other protective clothing. He had oil on his hands, arms, face, and clothing.

Powerhouse employees said that they wore no gloves or only cloth gloves in this cleaning operation. They stated that the filters are cleaned weekly, the process takes about 20 minutes per filter, and they frequently get fuel on their hands, arms, and clothing. OSHA and Medical Center health officials said that benzene can be absorbed through the skin. The foreman at the powerhouse said that powerhouse employees were not participating in any medical surveillance program.

The results of our survey were discussed with Medical Center officials. The OSHA industrial hygienist suggested (1) mandatory use of synthetic-material gloves, (2) re-engineering the fuel filtration system, and (3) prohibiting open buckets of fuel oil in the powerhouse.

CORRECTIVE ACTION
BY MEDICAL CENTER

In January 1977, after our air sampling was complete, an industrial hygienist from the Medical Center surveyed the powerhouse for benzene vapors and took air samples. In a memorandum to the safety manager, the hygienist re-

ported that the samples showed benzene concentrations of less than 1 ppm for seven samples taken at various locations in the powerhouse. The hygienist recommended, however, that the employees " * * * should not breath hydrocarbon vapors given off by No. 6 fuel oil which has been heated." He recommended also that respirators be worn by employees cleaning up oil spills, skin contact with number 6 fuel oil be avoided, and protective gloves be worn when cleaning filters, burners, and spills.

On a subsequent visit early in February 1977, we observed that signs had been posted in the powerhouse cautioning employees to avoid skin contact with the petroleum products in use and informing them of mandatory requirements for protective gloves and respirators.

We understand that the safety manager made a full report to the commander of the Medical Center on the circumstances surrounding the deaths of the two former employees.

CONCLUSIONS

Because of the seriousness of exposure to benzene or other toxic substances which may be found in number 6 fuel, and the possible implication of the recent leukemia-induced deaths of two Medical Center employees, we believe efforts should be made to determine the scope of the problem so appropriate action can be taken to prevent or minimize worker exposure to this hazard. Number 6 fuel is used by several Federal agencies and likely by private industry. We understand it is used extensively by power generation and steam-heating plants. Use of this fuel could cause dangerous exposure of employees if appropriate safeguards are not taken.

Our report to the Secretary of Defense recommended that DOD look into this problem with NIOSH's assistance.

RECOMMENDATIONS

We recommend that the Secretary of HEW make appropriate arrangements for NIOSH to assist DOD in its efforts to look into the health hazards which may be created by exposure to number 6 fuel. Since the potential for exposure also exists for workers outside DOD we recommend also that NIOSH be directed to determine whether occupational exposure to residual fuel oils which may contain benzene or other toxic substances creates health problems at other Federal and private industry workplaces.

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Because of OSHA's responsibilities for worker protection, we are sending a similar letter to the Secretary of Labor and recommending that OSHA (1) inform other Federal agencies and private industry of this hazard and (2) include residual fuels as a potential hazard to be checked for during OSHA inspections and surveys of workplaces.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on action taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Copies of this report are being sent today to the House Committee on Government Operations; the Senate Committee on Governmental Affairs; the House Committee on Education and Labor; the Senate Committee on Human Resources; the House Committee on Appropriations; the Senate Appropriations Subcommittee on Labor, Health, Education, and Welfare and related agencies; the House Subcommittee on Manpower and Housing; and the Director, Office of Management and Budget.

We would appreciate receiving your comments on any actions you take or plan on the recommendations made in this report.

We appreciate the courtesy and cooperation extended by your staff to our representatives during the review.

Sincerely yours,


Gregory J. Abart
Director

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We are bringing this matter to your attention so that you may take appropriate action to determine the scope of the problem and initiate whatever corrective measures may

HRD-77-118

be necessary to prevent or minimize employee exposure to this hazard. We plan to issue, at a later date, a full report on our work at all installations included in our review and will request your comments on a draft of the full report when it is completed.

BACKGROUND

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that the employees "* * * should not breath hydrocarbon vapors given off by No. 5 fuel oil which has been heated." He recommended also that respirators be worn by employees cleaning up oil spills, skin contact with number 6 fuel be avoided, and protective gloves be worn when cleaning filters, burners, and spills.

On a subsequent visit early in February 1977, we observed that signs had been posted in the powerhouse cautioning employees to avoid skin contact with the petroleum products in use and informing them of mandatory requirements for protective gloves and respirators.

We understand that the safety manager made a full report to the commander of the Medical Center on the circumstances surrounding the deaths of the two former employees. We requested a copy of this report, but we have not yet received one.

REVISIONS IN STANDARD FOR BENZENE EXPOSURE

NIOSH is responsible, under section 20(a)(3) of the Occupational Safety and Health Act of 1970, to develop criteria for toxic substance exposure levels at which employees will not suffer impaired health or functional capacities because of their work experience.

In July 1974 NIOSH issued a criteria document recommending that OSHA revise the standard for occupational exposure to benzene. At that time, NIOSH recommended an exposure limit of 10 ppm as a time-weighted average for a 10-hour workday, with a 25-ppm ceiling determined by a 10-minute sampling time.

In addition to the exposure limit, NIOSH recommended that, under certain conditions, employees "subject to exposure to benzene" be (1) provided periodic medical examinations and Biological monitoring; (2) informed and educated on benzene hazards; and (3) provided with, and instructed in the use of, protective clothing and equipment. NIOSH recommended also that employers be required to maintain exposure records and medical histories for each exposed employee, post signs at entrances to areas where exposure is likely to occur, and establish several work practices to protect workers.

In August 1976, after reviewing additional evidence accumulated from clinical and epidemiological data indicating that benzene was leukemogenic, NIOSH recommended a more stringent occupational exposure limit for benzene: 1 ppm as determined by a 2-hour air sample. NIOSH recommended also that, for regulatory purposes, benzene be considered carcinogenic to man. In a memorandum to OSHA, the director of NIOSH said

"Because it is not possible at present to establish a safe exposure level for a carcinogen, the NIOSH recommendation is to restrict exposure to very low levels that can still be reliably measured in the workplace."

In October 1976 NIOSH expressed concern over the need to accelerate the OSHA rulemaking process and strongly recommended that OSHA take emergency action to revise the benzene standard. In its memorandum to OSHA, NIOSH stated that a connection had recently been made between benzene and chronic leukemia.

The memorandum states that NIOSH considered recent evidence conclusive that benzene is leukemogenic and produces progressive, malignant disease of the blood-forming organs. Because it was not possible at the time to establish a safe benzene exposure level, NIOSH recommended that the exposure level be kept as low as possible--1 ppm in the air. According to a NIOSH official this is the lowest level which can feasibly be detected with devices currently in use.

Based on the information supplied by NIOSH, in January 1977 OSHA issued voluntary guidelines for the control of occupational exposure to benzene. The guidelines recommended an exposure limit of 1 ppm as a time-weighted average for any 8-hour day.

In January and April 1977 NIOSH submitted additional information to OSHA on the adverse effects of benzene. OSHA subsequently issued an emergency temporary standard for occupational exposure to benzene, which was to become effective May 21, 1977. This standard reduced the permissible workplace exposure to benzene from 10 ppm to 1 ppm, with a 5-ppm ceiling for any 15-minute period during an 8-hour day.

On May 20, 1977, a Federal court issued a restraining order staying the effective date of the emergency standard. As of June 29, 1977, the restraining order was still in effect.

The emergency standard will require that employers notify OSHA of the location of all workplaces where benzene is used, the condition of use, and the protective measures in effect. In addition, under certain conditions employers will have to maintain exposure records and medical histories on exposed employees, establish medical surveillance programs, require use of protective clothing and equipment, provide education and training programs, and establish other work practices to minimize or prevent employee exposure to benzene.

The emergency standard will apply to all employers and establishments in which benzene is present, except for two general groups:

- Those operations involving the storage, transportation, distribution, dispensing, or sale of gasoline as a fuel subsequent to discharge of such gasoline from bulk terminals.
- Those operations using liquid mixtures containing 1 percent or less benzene.

The exempted groups will continue to be subject to the old OSHA standard. OSHA says that employees working in the exempted groups are generally exposed to concentrations of less than 1 ppm. In its press release on the emergency standard, OSHA said these operations will be considered for inclusion in a permanent standard to be developed within 6 months.

Although the emergency standard reduced permissible exposure to a very low level, supplementary information provided by OSHA with the emergency standard states

"The best available scientific evidence indicates that no safe level for exposure to a carcinogen, including benzene, can be established or assumed to exist."

OSHA concluded that " * * * a single exposure episode may be sufficient to cause cancer."

CONCLUSIONS

OSHA and NIOSH believe it is currently impossible to determine whether a safe exposure level exists for carcinogens. Leukemia is a cancer and benzene has been known to cause leukemia. We believe, therefore, that until a determination can be made on a safe exposure level, any exposure to benzene should be reduced to the lowest level feasible.

Because of the seriousness of exposure to benzene and the possible implication of the recent leukemia-induced deaths of two Medical Center employees, we believe DOD should take whatever action may be necessary to provide maximum protection to its employees who are or have been exposed to benzene at the Medical Center and other locations. We believe the recommendations made by NIOSH in its criteria document, subsequent correspondence with OSHA, and the requirements of the emergency standard should guide such action. We believe also that the residual fuel oil used by the various DOD installations should be fully analyzed to determine whether it contains other toxic substances.

NIOSH officials said that they would be interested in following up on this matter to obtain more data on the effects of contaminated fuel oil on workers' health.

RECOMMENDATION

We recommend that the Secretary of Defense, with the assistance of NIOSH, look into the health hazards created by handling and using residual fuel oils which may contain benzene or other toxic substances. As part of this effort, appropriate action should be taken to:

- Identify which DOD installations use residual fuels, particularly number 6 fuel oil; and, using the latest NIOSH recommendations and OSHA standards, determine whether these fuel oils are used in a manner which assures worker protection from exposure to benzene.
- Analyze the fuel oil to ascertain whether it contains other toxic substances so appropriate action can be taken to assure worker protection.
- Establish a comprehensive medical surveillance program for powerhouse and other DOD employees who

may be or may have been exposed to benzene or other toxic substances which may be found in residual fuel oil.

DOD COMMENTS

Officials from the Office of the Secretary of Defense (OSD) did not agree that benzene could be a problem in the powerhouse. They said routine DOD analyses had never shown benzene was present in number 6 fuel oil. They said the distillation process used to refine crude oil should remove benzene from the residual fuels.

We discussed this matter with DLA officials and a representative of the oil company which produced the fuel oil used at the Medical Center's powerhouse. They said that number 6 fuel oil usually has a small amount of benzene since the refining process will not remove all of it. They said the same generally holds true for other toxic substances which can be found in residual fuels, including number 6 fuel oil. DLA officials stated that they did not routinely check residual fuels for benzene. They said the type of testing they do would not detect a benzene level lower than about 2 percent.

The officials from OSD questioned the reliability of the benzene detector tubes used by the OSHA industrial hygienist. We discussed this matter with DLA and NIOSH officials who said that although detector tubes are not completely reliable, such tubes are adequate to detect the presence of a toxic substance. They said that substances other than the one being tested for can interfere with the reaction of the detector tube, causing it to produce an erroneous reading. They said that the manufacturers of the detector tubes generally identify the interfering substances so that users have some indication of the tube's reliability and whether further testing might be warranted. They stated that detector tubes are able to detect the presence of toxic substances although they are not reliable to show exactly how much.

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Because NIOSH officials are interested in this matter we are sending the Secretary of Health, Education, and Wel-

fare a similar letter and recommending that he make arrangements for NIOSH to assist you.

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We would appreciate your comments on the findings and recommendations in this report, including any actions you take or plan to take on the recommendations.

We appreciate the courtesy and cooperation extended by DOD personnel to our representatives during this review.

Sincerely yours,


Gregory J. Ahart
Director

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This matter has been brought to the attention of the Secretary of Defense and the Secretary of Health, Education,

and Welfare. We recommended that they look into the hazards created by handling and using residual fuel oils; which may contain benzene or other toxic substances. We are bringing this matter to your attention so that (1) other Federal agencies and private industry can be informed of this hazard and (2) OSHA inspectors may check for this hazard in their workplace inspections.

BACKGROUND

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HAZARDS OBSERVED BY OUR
OFFICE AND OSHA HYGIENIST

In January 1977, at our request, an OSHA industrial hygienist surveyed the powerhouse and took air samples in the work areas. Also, a sample of the number 6 fuel was taken and analyzed for benzene. The air samples taken in the general working areas of the powerhouse showed that concentrations of benzene vapors in the air were less than 1 part per million (ppm). The OSHA hygienist said this low level was due to the ventilation produced by the boiler's air intake fans.

The air samples from inside the storage tanks showed concentrations of 60 ppm or more. The samples taken at the fuel filters inside the powerhouse showed concentrations exceeding 60 ppm--that is, the detection device became saturated immediately, indicating that the concentration exceeded 60 ppm, the maximum reading possible with the testing device used. These samples were taken to determine if benzene vapors were being emitted from the fuel oil. The fuel oil sample showed a concentration of about 1/10 of one percent by weight. The OSHA hygienist said such an amount, if released into the atmosphere, would far exceed the OSHA-established level for benzene exposure.

During our survey we observed a powerhouse employee cleaning fuel filters used in the system. Cleaning was accomplished by filling a metal bucket with fuel oil and cleaning the filter by hand in the bucket. The employee wore no gloves or other protective clothing. He had oil on his hands, arms, face, and clothing.

Powerhouse employees said that they wore no gloves or only cloth gloves in this cleaning operation. They stated that the filters are cleaned weekly, the process takes about 20 minutes per filter, and they frequently get fuel on their hands, arms, and clothing. OSHA and Medical Center health officials said that benzene can be absorbed through the skin.

The foreman at the powerhouse said that powerhouse employees were not participating in any medical surveillance program.

The results of our survey were discussed with Medical Center officials. The OSHA industrial hygienist suggested (1) mandatory use of synthetic-material gloves, (2) re-engineering the fuel filtration system, and (3) prohibiting open buckets of fuel oil in the powerhouse.

CORRECTIVE ACTION
BY MEDICAL CENTER

In January 1977, after our air sampling survey was complete, an industrial hygienist from the Medical Center surveyed the powerhouse for benzene vapors and took air samples. In a memorandum to the safety manager, the hygienist reported that the samples showed benzene concentrations of less than 1 ppm for seven samples taken at various locations in the powerhouse. The hygienist recommended, however, that the employees "* * * should not breath hydrocarbon vapors given off by no. 6 fuel oil which has been heated." He recommended also that respirators be worn by employees cleaning up oil spills, skin contact with number 6 fuel be avoided, and protective gloves be worn when cleaning filters, burners, and spills.

On a subsequent visit early in February 1977, we observed that signs had been posted in the powerhouse cautioning employees to avoid skin contact with the petroleum products in use and informing them of mandatory requirements for protective gloves and respirators.

REVISIONS IN STANDARD
FOR BENZENE EXPOSURE

The OSHA standard for occupational exposure to benzene-- adopted in 1971--is 10 ppm as an 8-hour time-weighted average with a ceiling of 25 ppm. The standard does not include required work practices or other measures to protect workers. In May 1977 an emergency temporary standard for occupational exposure to benzene was to reduce the permissible workplace exposure to benzene from 10 ppm to 1 ppm, with a ceiling of 5 ppm for any 15-minute period during an 8-hour day. The emergency standard includes required work practices and other measures to protect workers. However, a court order has temporarily stayed the effective date of the proposed emergency standard.

In July 1974 NIOSH issued a criteria document on occupational exposure to benzene and recommended an exposure limit of 10 ppm as a time-weighted average for a 10-hour day, with a 25-ppm ceiling determined by a 10-minute sampling

time. In addition, NIOSH recommended periodic medical examinations and biological monitoring for employees subject to exposure to benzene. It recommended also that, under certain conditions, various work practices be established and maintained to protect workers.

In August 1970, after considering additional chemical and epidemiological data, NIOSH recommended a more stringent benzene exposure limit of 1 ppm. At the time, NIOSH recommended also that, for regulatory purposes, benzene be considered carcinogenic to man. In a memorandum to OSHA, the Director of NIOSH said

"Because it is not possible at present to establish a safe exposure level for a carcinogen, the NIOSH recommendation is to restrict exposure to very low levels that can still be reliably measured in the workplace."

In October 1976 NIOSH expressed concern over the need to accelerate OSHA's rulemaking process and strongly recommended that emergency standards be established for benzene and certain other toxic substances. NIOSH said that it considered recent evidence to be conclusive that benzene is leukemogenic and produces progressive, malignant disease of the blood-forming organs.

In January and April 1977 NIOSH submitted additional information to OSHA on the adverse effects of benzene. OSHA subsequently issued an emergency temporary standard for occupational exposure to benzene, which was to become effective May 21, 1977. On May 20, 1977, a Federal court issued a restraining order staying the effective date of the emergency standard. As of June 29, 1977, the restraining order was still in effect.

Although the emergency standard will reduce permissible exposure to a very low level, supplementary information provided by OSHA with the emergency standard states:

"The best available scientific evidence indicates that no safe level for exposure to a carcinogen, including benzene, can be established or assumed to exist."

OSHA concluded that "* * * a single exposure episode may be sufficient to cause cancer."

CONCLUSION

OSHA and NIOSH believe it is currently impossible to determine whether a safe exposure level exists for carcinogens. Leukemia is a cancer and benzene has been known to cause leukemia. We believe, therefore, that until a determination can be made on a safe exposure level, any exposure to benzene should be reduced to the lowest level feasible.

Because of the seriousness of occupational exposure to benzene and other toxic substances which may be found in number 6 fuel, and the possible implication of the leukemia-induced deaths of the two Medical Center employees, we believe OSHA should consider taking additional steps to protect workers from unnecessary exposure to these hazards. Number 6 fuel is used by several Federal agencies and likely by private industry. We understand it is used extensively by power generation and steam-heating plants. Use of this fuel could cause dangerous exposure of employees if appropriate safeguards are not taken.

RECOMMENDATIONS

We recommend that the Secretary of Labor inform Federal agencies and private industry of the health hazards which can be created by handling and using residual fuel oils which may contain benzene and other toxic substances. We recommend also that residual fuels be included as a potential health hazard which should be checked for during OSHA's inspections and surveys of workplaces.

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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on action taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Copies of this report are being sent today to the House Committee on Government Operations; the Senate Committee on Governmental Affairs; the House Committee on Education and Labor; the Senate Committee on Human Resources; the House Committee on Appropriations; the Senate Appropriations Subcommittee on Labor, Health, Education, and Welfare and related agencies; the House Subcommittee on Manpower and Housing; and the Director, Office of Management and Budget.

We would appreciate your comments on the findings and recommendations in this report, including any actions you take or plan to take on the recommendations.

We appreciate the courtesy and cooperation extended by your staff to our representatives during this review.

Sincerely yours,


Gregory J. Hart
Director