UNIVERSITY OF MINNESOTA

University Senate Consultative Committee
125 Mechanical Engineering
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November 27, 1990

Professor Warren Ibele, Chair
Senate Consultative Committee
125 Mechanical Engineering

Dear Warren:

With this letter I forward the report on asbestos and radon prepared by the Subcommittee on Physical Plant and Space Allocation. The Committee on Finance and Planning reviewed this report at two meetings and now forwards it to the Senate Consultative Committee.

It is our view that this report should be provided to the Senate for information.

Please let me know if you have questions or wish any additional steps to be taken.

Cordially,

Burton L. Shapiro, Chair
Senate Committee on Finance and Planning

November 20, 1990

To: Burton Shapiro, Chair
Finance & Planning Committee

From: Mary Sue Simmons, Chair MSS
Physical Plant & Space Allocation Subcommittee

Subj: Transmittal of Final Report on Asbestos & Radon in University of Minnesota Buildings

The PPSA Subcommittee spent time last year drafting the above report. We brought a draft before the Finance Committee on May, 1990 for input and review. Having incorporated points from that discussion and strengthening the recommendations, the report is now officially transmitted to you.

I am aware that there are other University reports and committees dealing with asbestos. Knowledge and coordination of these efforts probably rests with Gus Donhowe, Senior Vice President for Finance and Operations. I would certainly be willing to follow up if you and your committee wished any further involvement on the part of PPSA.

We worked long and hard on the attached report and hope it can now go forward for inclusion into the University's portfolio of asbestos-related information data bank.

Asbestos and Radon in University of Minnesota Buildings: Final Report and Recommendations from the Physical Plant and Space Allocation Subcommittee (October, 1990)

How the University of Minnesota deals with potentially hazardous substances such as asbestos and radon in its buildings is an issue which affects every member of the University community. It is also a complex issue which tends to produce sharply divided opinions and heated, but sometimes poorly informed debate. This situation has led to an unfortunate atmosphere of confusion and mistrust among students, faculty, staff and administrators about the seriousness of the situation, about who is in charge of handling it, and about what actions are being taken.

During the last two years, in an effort to gain a clearer understanding of the matter, the Physical Plant and Space Allocation Committee has spoken with concerned faculty members as well as personnel from Physical Plant Operations, Physical Planning, Finance and Operations, and Environmental Health and Safety. Although there are differences of opinion among members of the committee about some issues, we are all in agreement that the members of the University community deserve to be better informed about the extent of the problem as well the potential health risks associated with exposure to these substances. It is our belief that a well informed community will be much more capable of dealing effectively with the situation.

Asbestos

Asbestos is a term for several types of silicate mineral that occur naturally in the form of thin, durable, heat-resistant fibers. Between 1900 and about 1980 asbestos was commonly used in construction for a variety of purposes including acoustical and thermal insulation in walls, ceilings, floor tiles, and around pipes. Its use in applications where the fibers are not in bound form has declined due to a

series of federal regulations imposed when evidence began accumulating that prolonged exposure to high concentrations of airborne asbestos particles in industrial settings was associated with health problems such as asbestosis (a chronic lung disease), lung cancer, and mesothelioma (a cancer of the chest and abdominal membranes).

These diseases appear to be caused by asbestos fibers which are inhaled and become trapped in lung tissue. Although it is clear that exposure to very high concentrations of asbestos dust can lead to disease, the effects of lower exposure levels have not been precisely determined. The estimated magnitude of risk varies widely among the studies that have been conducted and there are different risks for the various asbestos-related diseases (Rom and Upton, 1990). Further complicating the picture is the fact that different types of asbestos fiber appear to be associated with different degrees of risk, with the most commonly used form (chrysotile) posing the least significant threat. However, based on the existing data, a recent article in Science magazine concluded that the risk of dying from lung cancer or mesothelioma as a result of exposure to airborne asbestos fibers in concentrations typically found in public buildings "is miniscule" when compared to other commonplace risks in modern society (Mossman, et al., 1990). For example, in comparison to the risk of dying from exposure to the average airborne asbestos level found in a survey of public schools (0.00024 fibers per cubic centimeter of air), the likelihood of dying in an aircraft accident is 65 times greater, the chance of drowning is 290 times greater, and the risk of dying from long term smoking is nearly 13,000 times greater. In light of the uncertainty surrounding the effects of exposure to relatively low levels of airborne asbestos,

it seems prudent for individuals as well as institutions to take reasonable precautions to minimize exposure, but also to avoid overreaction which leads to poor decision making (cf. Lilis, 1986; Mossman, et. al., 1990).

Recently, the Department of Environmental Health and Safety completed a $100,000 survey of all University of Minnesota buildings to identify locations where there is asbestos-containing material (ACM). The survey involved walk-through inspection and bulk sampling of suspected ACM. It revealed that approximately 260 buildings in the University of Minnesota system contain some ACM. However, the survey report concluded that the overall condition of the ACM is generally good and poses no imminent health risk to building occupants. The survey has received some criticism about the methods which were used to sample and test asbestos levels. There has also been a suggestion that another comprehensive survey be conducted, with more extensive sampling and more sensitive testing. The committee feels that the additional information gained by a new comprehensive survey would not be worth the estimated $1 million cost of performing it. Data from the old survey should be reviewed and supplemented by additional testing of specific sites as needed.

Because asbestos poses a potential threat to health only when the material is friable (dry, crumbly and exposed to air), a program of total asbestos abatement at the University, which would cost an estimated $80 million, seems clearly unrealistic and unnecessary. In fact, scientists have pointed out that removing ACM may temporarily raise the concentration of airborne asbestos above the level present before removal began, thus increasing the potential threat to health, especially for workers involved in the abatement process (Abelson, 1990).

Removal of ACM is required only when there is danger of it being disturbed, as is the case during some remodeling projects or when buildings are demolished. Under those circumstances, federal regulations require that extensive precautions be taken to minimize release of asbestos fibers into the air, and that air samples be taken regularly to ensure a safe working environment. At present, the Department of Environmental Health and Safety has primary responsibility for monitoring projects at the University which require asbestos abatement. The safety procedures required whenever ACM must be removed often add substantially to the cost of the project. The added costs are typically paid for by the unit which orders the renovation, although the Office of Finance and Operations has some funds from a recent court settlement against companies which manufactured or installed ACM in University and other state buildings.

Perhaps as important as careful removal of ACM when necessary is ongoing monitoring and maintenance of all ACM in University buildings. At present there is no comprehensive program in place to insure that ACM is regularly inspected and kept in good repair. It is encouraging that the departments of Finance and Operations, Physical Planning, Environmental Health and Safety, and Physical Plant Operations have recently begun discussions about the design and implementation of such a plan. It is the opinion of our committee that a program of routine inspection and maintenance should involve education and training of custodians and other regular occupants of buildings which contain ACM. Occupants should be informed of known locations of ACM in their buildings and they should be encouraged to monitor its condition. When a potential problem is discovered, there should be a clearly designated individual to whom the situation can be reported

and who is in a position to ensure that prompt action is taken.

Radon

Radon is a colorless, odorless gas which is produced in the decay chain of radioactive uranium in the soil. It can enter buildings through cracks or other openings in basement floors and walls. In recent years it has been recognized that breathing radon gas can cause lung cancer, and possibly other forms of cancer. In fact, current views indicate that radon may pose a much more serious threat to health than asbestos. One recent estimate by the Environmental Protection Agency (EPA) suggests that at least 5,000 lung cancer deaths per year are caused by radon. That represents a health risk for radon that is 100 to 200 times greater than the risk associated with asbestos (Jordan, 1989).

In spite of the evidence concerning radon as a health threat, there are currently no federal regulations which establish permissible levels in buildings. The EPA has issued guidelines suggesting that a radon concentration of 4.0 pCi/l (picoCuries per liter of air) is the point at which abatement action should be considered. Efforts are now underway to assess the extent of radon contamination in private houses and other buildings throughout the United States.

At the University of Minnesota there is currently no systematic program in place to evaluate radon contamination of buildings. As of November, 1988, 34 locations on the Twin Cities and Duluth campuses had been tested for radon by the Department of Environmental Health and Safety in response to requests from University personnel. None of the tested locations showed radon levels higher than 4.0 pCi/l, although one UMD location tested at exactly that level. (These tests measured the radon concentration in an air sample taken at a single point in time.

The EPA guideline applies to the long-term average concentration of radon measured by an alpha track detector which is left in place for several months.)

Because of the potentially serious threat to health posed by radon, this committee believes that a systematic survey of University buildings for radon contamination should be conducted without delay. Alpha track detectors should be used to determine long-term average concentrations. Because radon concentrations are almost always highest in the lowest levels of a building, the survey should focus initially on testing basement locations which are occupied for large portions of the day. Fortunately, testing for radon is relatively inexpensive (approximately $15 per detector), so a comprehensive survey will not place too great a financial burden on the University. Sources of funds for abatement projects if high radon levels are found are unclear.

Recommendations

1. A systematic operations and maintenance program should be established to ensure that asbestos-containing material (ACM) in University buildings is inspected regularly and kept in good repair.

2. An impartial committee of knowledgeable, interested people should review the Environmental Health and Safety survey of ACM in University buildings and evaluate the adequacy of the data as a basis for making decisions about abatement.

3. During remodeling projects, ACM should be removed only when it is required by federal regulations. When removal is not clearly required, project managers are urged to consider leaving in place any ACM that is in good condition.

Recommendations (continued)

4. A comprehensive survey of all University buildings for radon contamination should be conducted, beginning with basement locations which are frequently occupied by people. Alpha track detectors which measure long-term average concentrations should be used.

5. Adequate resources should be made available to ensure reliable, accurate testing for both radon and asbestos. This could be accomplished by providing additional funds to Environmental Health and Safety to update their equipment and hire the necessary personnel, and/or by hiring qualified outside contractors to perform some tests.

6. The Physical Plant and Space Allocation Committee should have an *ex officio* member from the Department of Environmental Health and Safety.

References

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