



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

National Institute for Occupational
Safety and Health
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati OH 45226-1998

February 3, 2006
HETA 2005-0277

Dirk Meyer, Modernization Program Liaison DOI
U.S. Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Dear Mr. Meyer:

On June 17, 2005, the National Institute for Occupational Safety and Health (NIOSH) received a confidential employee request for a Health Hazard Evaluation (HHE) at the U.S. Department of the Interior (DOI), Washington, D.C. The request expressed concern that exposures to dust and chemical odors (possibly from Aramsco RAMTACK adhesive and Aramsco CHEMSAFE 100) during the ongoing modernization of the Main Building were associated with neurological and respiratory problems, asthma, nausea, tingling in limbs, fibroid tumors, lung lesions, congestion, fatigue, and mental disorientation.

In association with this request, we received and evaluated the following:

- emails and telephone calls with several DOI employees about indoor environmental quality (IEQ) issues and their health concerns;
- a letter (dated July 13, 2005) from Dr. John Girman, (Senior Science Advisor, Indoor Environments Division, Environmental Protection Agency) to Dirk J. Meyer [Modernization Program Office (MPO) Liaison, DOI], which made suggestions for improving air quality in the Main Building during the renovation;
- a document (dated August 18, 2005) containing DOI comments clarifying some points in the EPA letter;
- a letter (undated) from Anne Marie Sweet-Abshire (MPO Liaison, GSA) to Dirk J. Meyer responding to the EPA suggestions and DOI comments; and
- Material Safety Data Sheets (MSDS) for Aramsco CHEMSAFE 100 and Aramsco RAMTACK Adhesive.

We also had phone discussions with several managers and employees at the DOI, the Environmental Protection Agency (EPA), and the General Services Administration (GSA), which owns the Main Building and rents it to the DOI.

This letter is the final report of our evaluation and contains background on the modernization project, a discussion of issues employee safety and health concerns, and our recommendations for improving ventilation and communication. In addition, enclosed are the following three supporting documents: Good Practice Guidelines for Maintaining Acceptable Indoor Environmental Quality During Construction and Renovation Projects, Issues in Indoor Environmental Quality, and Building Air Quality Action Plan.

Page 2 – Dirk Meyer

Background: U.S. Department of the Interior, Main Interior Building

Constructed in 1936, the Main Interior Building encompasses over 1 million square feet, rises 7 stories (plus a basement, penthouse, and mechanical floor), and houses about 2000 people. The modernization project began 2 years ago and is expected to continue until 2011. The MPO serves as the administrative center for the renovation, with liaisons from the DOI and GSA sharing responsibility. The general contractor and its many subcontractors report to the MPO. During the modernization, infrastructure upgrades will occur in the heating, ventilating and air-conditioning (HVAC), plumbing, electrical, and fire protection systems, as well as removal of asbestos-containing material and lead-based paint. The work is divided into 6 phases, with each phase corresponding to a wing of the building. Most employees are removed from a wing while it is under renovation.

Both the GSA and the DOI have onsite industrial hygienists who are able to evaluate the constantly changing work environment. Currently, GSA industrial hygienists conduct weekly area screenings for total volatile organic compounds and total particulates in areas near construction activity using real-time instruments, and if readings are above background, additional in-depth sampling may be conducted. In addition to the in-house industrial hygienists, an independent third-party industrial hygienist monitors all activities that could impact asbestos-containing materials. According to the GSA liaison, health and safety specifications are part of all contracts, including such activities as installing fire resistant partitions to separate occupied areas from construction and scheduling overly disruptive activities for nights and weekends.

In response to a separate HHE request received in 1999 (HETA 99-0324) concerning a variety of IEQ issues, NIOSH investigators had conducted a site visit to the Main Interior Building. The October 26, 2000, close-out letter (copy enclosed) recommended improvements to the ventilation system. Most of these recommendations should be resolved with the installation of the new HVAC system. However, the presence of a kitchen smoker with a stack discharge close to the roof, which has not yet been corrected, may be a source of soot and odors.

Findings

Employee Safety and Health Issues

NIOSH has dealt with many IEQ concerns over the years, and these are summarized in the enclosed document, Issues in Indoor Environmental Quality. Although NIOSH investigators have often found multiple environmental deficiencies in buildings with IEQ complaints, the relationship of these symptoms to environmental deficiencies found is often unclear. Many of the symptoms (neurological, fatigue, and nausea) reported by the Main Building occupants are not suggestive of a specific medical diagnosis or readily associated with a particular workplace exposure. Fibroid tumors and lung lesions have not been associated with office building exposures.

Page 3 – Dirk Meyer

Prior IEQ studies demonstrate closer associations of symptom occurrence with occupant perceptions of the indoor environment rather than with any measurement of indoor contaminants or conditions^{1,2,3}. A typical spectrum of reported symptoms includes headaches, fatigue, itching or burning eyes, irritation of the skin, nasal congestion, dry or irritated throats, and other respiratory symptoms. These symptoms are also often experienced by people outside of the workplace and could be related to a number of different causes, such as respiratory infections, allergies, discomfort due to temperature and humidity, and stress. Workers suspect a workplace cause because their symptoms appear to be worse while at work and better when away from work. Some studies have shown that psychological, social, and organizational factors may modify individuals' and organizations' responses to concerns in the office environment.^{2,4,5}

While we would not be able to causally link diverse health effects with varying environmental exposures in an HHE, our investigations at the DOI revealed several issues that could exacerbate health problems or interfere with the ability for prompt evaluation.

Ventilation

The presence of adhesive odors in office areas near active renovation areas of the Main Building suggests that negative pressure is not being adequately maintained in construction areas relative to the office areas. The enclosed document, Good Practice Guidelines for Maintaining Acceptable Indoor Environmental Quality during Construction and Renovation Projects, contains suggestions to assure that this problem does not occur. Relatively simple controls, such as restricting the number of windows which are removed at one time during window replacement or limiting worker movements through barriers intended to isolate construction activities, may ameliorate this problem, but it is likely that maintaining a negative pressure might require different strategies depending upon the work being undertaken. For this reason, it is important to enforce bid specifications and to designate a representative of the general contractor to handle IEQ issues and establish appropriate channels of communication with subcontractors, such as is recommended in the attached good practice guidelines document.

Organization

In the case of the Main Interior Building, opportunities to improve organizational factors and communication are apparent. The responsibility for responding to health and safety concerns of the DOI employees is dispersed among different organizational units throughout two government agencies. A DOI industrial hygienist is the initial contact for receiving and logging employee complaints (which he estimated to number in the hundreds in the past two years). Complaints are passed to the DOI program manager, and then to the GSA program manager. If the complaint involves a work procedure of the general contractor (Grunley Construction Company) or one of its many subcontractors, it must be forwarded to them before corrective action can occur. Similarly, if an employee wishes to see a MSDS, which is a legal prerogative, the request takes the same path from the requester to the DOI and GSA program managers to the subcontractor and then back again before the MSDS arrives. As a result, employees stated that it sometimes takes months to receive a MSDS.

Page 4 – Dirk Meyer

Recent attempts have been made to improve communication with the DOI employees regarding the modernization. Two newsletters (August 2005 and October 2005) have been produced and can be found on the MPO webpage (<http://www.doi.gov/modernization/index.html>). Postings on the webpage alert workers to bi-monthly tenant user group meetings and provide a MPO hotline phone number. However, employees stated to us that they left messages on the hotline but did not receive direct responses. The October newsletter noted that the EPA experts in IEQ had visited the Main Interior Building and had provided suggestions specific to the project. However, employees we contacted had not received any information regarding how the suggestions had been addressed. Finally, we noted on January 30, 2006, that 6 of 9 of the available links on the website's homepage were still under construction, including ones labeled "indoor air quality," "life safety," and "security."

Incomplete communication efforts imply missed opportunities for educating employees, alerting management to potential problems, and developing mutual trust. For instance, DOI employees should be given reliable information regarding health risks and understand that perception of odors does not necessarily indicate a health risk. For example, most people smell acetone (one of the solvents in Aramsco RAMTACK) at concentrations below occupational exposure limits, i.e., at a much lower level than is thought to be harmful to them. However, even at low concentrations, a small percentage of people may experience adverse health effects because of individual susceptibility, pre-existing medical conditions, and/or hypersensitivity (allergy). In addition, some hazardous substances have no odors, such as carbon monoxide. If people have concerns about odors or related health effects, they should be encouraged to contact the health and safety representatives and receive prompt and clear information regarding their concerns.

Conclusions and Recommendations

In summary, the fact that many workers reportedly are complaining about odors indicates that good practices are not being followed during the modernization of the Main Interior Building. The following are our recommendations:

- Adopt the recommendations in Good Practice Guidelines for Maintaining Acceptable Indoor Environmental Quality During Construction and Renovation Projects, focusing on the ventilation issues outlined in the EPA assessment.
- Streamline communications (including providing MSDS information on all products in a timely manner, completing the website links, and providing data regarding environmental sampling).
- Respond promptly to worker health complaints.
- Create a committee composed of DOI and GSA management and employee representatives responsible for addressing building-related complaints such as described in the enclosed Building Air Quality Action Plan. This committee should meet on a regular basis to facilitate communication and resolution of worker health and safety issues.

Page 5 – Dirk Meyer

We hope this information will assist you in resolving some of the concerns at the Main Interior Building. This letter closes our file on this health hazard evaluation request. NIOSH recommends that employers post a copy of this letter for 30 days at or near work areas of affected employees. If you have any questions, please do not hesitate to contact us at (513) 841-4580.

Sincerely yours,

Lynda M. Ewers, Ph.D., M.S., CIH, CHMM
Industrial Hygienist
Hazard Evaluations and Technical
Assistance Branch
Division of Surveillance, Hazard
Evaluations and Field Studies

Loren C. Tapp, M.D., M.S.
Medical Officer
Hazard Evaluations and Technical
Assistance Branch
Division of Surveillance, Hazard
Evaluations and Field Studies

cc:

Confidential Requester

Lynn Scarlett, Assistant Secretary, Policy, Management, and Budget

Anne Marie Sweet-Abshire, Modernization Program Liaison, GSA

Enclosures:

4

Page 6 – Dirk Meyer**References**

1. NIOSH [1991]. Hazard evaluation and technical assistance report: Library of Congress, Washington, D.C. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, NIOSH Report No. HHE 88-364-2104.
2. Berglund L, Cain WS [1989]. Perceived air quality and the thermal environment. In: *Proceedings of IAQ '89: The Human Equation: Health and Comfort*. Atlanta, GA: American Society of Heating, Ventilating, and Air-Conditioning Engineers, pp. 93-99.
3. Boxer PA [1990]. Indoor air quality: a psychosocial perspective. *Journal of Occupational Medicine* 32(5):425-428.
4. Baker DB [1989]. Social and organizational factors in office building-associated illness. *Occupational Medicine: State of the Art Reviews* 4(4):607-624.
5. Ooi PL, Goh KT [1997]. Sick building syndrome: an emerging stress-related disorder? *International Journal of Epidemiology* 26(6):1243-1249.