

**ADVISORY NO. 18.0: UNIVERSITY OF CINCINNATI
GUIDELINES FOR RESOLUTION
OF INDOOR AIR QUALITY COMPLAINTS**

INTRODUCTION

Over the past few years, building operations offices have experienced a growing number of complaints from members of the university community in regard to indoor air quality (IAQ). In response to these concerns, a variety of procedures have been developed to investigate these complaints. Departments have frequently requested guidance from Environmental Health & Safety on the methods to be used in resolution of these situations.

The following guidelines were developed by a special University of Cincinnati system working group whose members have had experience in investigation and resolution of indoor air quality complaints.

POLICY STATEMENT

Each department has a responsibility to maintain a healthy indoor air quality environment. Complaints will be investigated in a prompt and systematic manner. Remedial action will be taken as rapidly as resources permit. Environmental Health & Safety will investigate and make recommendations and/or initiate project requests when such action is appropriate.

BACKGROUND

Experiences in the University of Cincinnati system indicate that the majority (an estimated 80 percent) of "indoor air quality complaints" are related to heating, ventilating, and air conditioning (HVAC) and temperature/humidity control deficiencies.

A fundamental need is to establish procedures to distinguish environmentally uncomfortable situations from more serious, environmentally hazardous problems. A hazardous situation is one in which building conditions present a clear threat to the health and safety of building occupants due to a potential exposure to a hazardous material. If a response investigation indicates a hazardous condition, then an accelerated process would be initiated.

PROCEDURE

Department complaints should initially be directed through supervisors to the appropriate organization (Facilities Management). A plant investigation into the complaint should be made in a timely fashion. The investigator should have supervisor status over those conducting routine HVAC maintenance and operating responsibilities. The investigation should follow a standard format and be documented in writing. The documentation will be filed as reference.

(A subsidiary function of complaint documentation could be statistical analysis of data collected over a year or two. This might lead to insights for resource allocation to minimize certain types of problems.)

Designated department investigators must be trained in the procedures and equipment to be used. Quick and easy tests are all that is indicated for this stage of an investigation. The equipment must be routinely calibrated and maintained. It is expected that the cost of this training, testing, calibration and maintenance will be covered by campus operating funds. Documentation of the training, calibration, and maintenance must be retained.

Ongoing needs identified in this area:

- Inventory available equipment on each campus
- Identify staff responsible for investigations

- Establish initial training program and yearly refreshers.

The initial investigation will document the fundamental HVAC parameters of temperature, humidity, and airflow. The focus will be on the operating HVAC system, although attention should be given to existing space use within the facility. It is possible that a space overload may be partially responsible for the problems identified. Additional information on air quality will be taken to eliminate the possibility of explosions or dangerous levels of common gaseous contaminants. This possibility is seen as unlikely, but the information is necessary because the consequences could be of significant concern.

If a specific contaminant is suspected due to known allergies or obvious sources such as new carpeting, the initial investigation could include (or perhaps be limited to) simple tests for formaldehyde or other volatile chemicals using indicator tubes or mold/fungi counts using an Anderson sampler with specific media. This could be a campus option assuming the availability of appropriate equipment and staff with suitable training.

The usual initial investigation may involve:

- Standard information and assessment
- Standard ventilation inspection
- Air flow hood, magnehelic or other suitable static pressure gauge
- Tri-gas meter (oxygen, LEL, carbon monoxide/hydrogen sulfide)
- Indicator tubes and a suitable air pump

The assumption is that most of the complaints can be resolved at this stage by repair, preventive maintenance, or housekeeping. If the problem is not readily identified and corrected, a second phase of the process would begin. Some situations such as temperature and humidity complaints attributable to state policy may not be resolved in Phase I, yet additional investigation would not necessarily be called for. A consistent method of conveying information about the investigation to the employee(s) should be adopted by each campus.

At a second phase, Environmental Health & Safety and Risk Management personnel would become involved with Facilities Management. A review would be conducted following the information collected. Applicable physician reports and MSDS information, concerning chemical products to which the employee may be exposed, should be considered. Other technical information may be considered, if available.

A group decision involving campus Facilities Management, Environmental Health & Safety, the supervisor of the person registering the complaint, and Risk Management should be made. Possible solutions without problem identification might be to significantly increase area airflow or to relocate the employee without any change in building mechanical systems. A change in space use and/or a change in the density of occupants may also be considered in this situation.

An unidentified problem reaching this stage of investigation is likely to be too difficult to resolve and has a possibility of involving direct expenses for corrective action and/or compensation related to affected building and occupants. System expertise in engineering, environmental health, and risk management should be used as needed.

A possible additional phase of investigation for intractable problems would result from a group decision of appropriate system personnel and campus representatives who had been involved in the initial two phases of investigation. If there is a need to accumulate additional information for decision-making, the following may be required:

- Additional in-house testing (dependent on available equipment & staff),
- Industrial hygiene investigation,
- Hire an outside consultant (possibly with a mini-project).

The proposed training and annual refresher courses will serve the additional purpose of providing training and reinforcement for the establishment of a confined space entry program on the campuses. General committee recommendations on air quality issues include:

- Maintenance and operating departments should implement basic HVAC maintenance, if no such program exists at present,
- Maintenance and operating departments should review their HVAC preventive maintenance programs for possible improvement such as scheduled duct cleaning,
- Laboratory fume hoods should be regularly inspected for performance at intervals of no more than a year,
- Biosafety hoods should be annually certified in accordance with NSF 49 standards of performance,
- Building occupants should be trained in the proper use of hoods within their work area,
- If radon is suspected (typically in poorly ventilated basement areas), investigation should involve triplicate sampling for alpha tracks to be definitive,
- All indoor air quality complaints may not be resolved; employee workspace relocation or employee transfer might be necessary.
- Seasonal issues such as mold or allergens should be targeted.

ADDITIONAL INVESTIGATION:

This process may need to be expanded to include inspection of air handling systems servicing the room(s) in question. This inspection would identify problems, suggest solutions, and determine code compliance. Specifically, the room air changes and outside air quantities determined in the air handlers minimum outside air operating conditioners need to be measured and documented. Air handling system-operating conditions should be measured and documented. Such items as static pressure gain, filter and coil pressure drops, supply and return air system volumes are included. Other factors include duct static pressures, fan speed, motor design, operating horsepower, current and so forth. In general, the inspection forms should be used to verify code compliance, and a single room inspection may not provide the needed information. Thus, this additional investigation guideline is provided.

REFERENCES:

Statutory Reference, which may be applicable: OSHA's Air Contaminants Standard (29 CFR 1910, Table Z-1-A, See Advisory 2, Appendix 4). www.osha.gov/comp-links.html

Other References:

ASHRAE Standard 62-1989: Ventilation for Acceptable Indoor Air Quality; Maryland State Department of Education: Guidelines for Controlling Indoor Air Quality Problems Associated with Kilns, Copiers, and Welding in Schools). Building Air Quality: A Guide for Building Owners and Facility Managers - EPA Publication Number 91-114, December, 1991.