**U.S. DEPARTMENT OF TRANSPORTATION**
FEDERAL AVIATION ADMINISTRATION

Air Traffic Organization Policy

**ORDER JO 3900.76**

Effective Date:
10/24/2019

**SUBJ:** Management of Indoor Air Quality (IAQ) at Air Traffic Organization (ATO) Facilities

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1. This order establishes Air Traffic Organization (ATO) requirements, standards, and procedures as well as delineates roles and responsibilities for indoor air quality (IAQ). This standardized approach will ensure IAQ issues are properly identified and mitigated at ATO owned, leased, or maintained facilities and will contribute to a safe and healthful work environment for employees.

2. This order applies to all ATO organizations and personnel in staffed ATO-owned, leased, and/or maintained facilities.

3. The Occupational Safety and Health Administration (OSHA) has established occupational exposure limits and enforces workplace standards. Due to the absence of specific IAQ regulatory standards, the ATO must follow the General Duty Clause and must also comply with applicable state and local IAQ regulatory requirements for Federal facilities. The ATO will adhere to the provisions in current, applicable collective bargaining agreements concerning IAQ.

Teri L. Bristol
Chief Operating Officer
Air Traffic Organization

RECORD OF CHANGES DIRECTIVE NO. JO 3900.76

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**FAA Form 6000-25 (10/12)**

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## Chapter 1. General Information

**1. Purpose of This Order.** This order establishes the ATO's requirements, standards, and procedures for managing IAQ in ATO facilities. The ATO is committed to maintaining acceptable IAQ, anticipating and recognizing conditions that may adversely affect IAQ, and evaluating and mitigating specific IAQ concerns at ATO staffed buildings and facilities. When workplace IAQ is properly maintained, thermal comfort, humidity, and concentrations of airborne contaminants are kept at acceptable levels.

The ATO will evaluate and mitigate IAQ issues and any potential impacts to employees. Common contaminants include mold, volatile organic compounds (VOCs), chemicals associated with maintenance and housekeeping, formaldehyde, particulates, ozone, motor vehicle exhaust, sewer gases, and environmental tobacco smoke (ETS) which includes second-hand and third-hand smoke and byproducts and vapors from electronic cigarettes. Biological contamination, such as mold growth, is usually the result of a moisture event in the building/facility. Moisture events could include excessive humidity, interior condensation, roof leaks, pipe ruptures, flooding from outside sources, and condensate overflow from heating, ventilation, and air conditioning (HVAC) equipment. IAQ issues may also result from nuisance odors, vapors, or particulates from construction/renovation work or from outdoor air infiltration.

The ATO will comply with all OSHA regulatory standards for airborne contaminants. The ATO will follow all Executive Orders regarding acceptable IAQ levels and mold.

**2. Audience.** This order is intended for use by all ATO employees and occupants in staffed facilities that are ATO-owned, leased, or maintained.

**3. Where Can I Find This Order.** You can find an electronic copy of this order on the Directives Management System (DMS) website: https://employees.faa.gov/tools_resources/orders_notices/. Or go to the MyFAA employee website, select "Tools & Resources" and then select "Orders and Notices".

**4. What This Order Cancels.** This order cancels the ATO guidance documents entitled Indoor Air Quality Implementation Guidance and Guidance for the Management of Mold in FAA Facilities (both dated September 30, 2006).

**5. Explanation of Policy Changes.** This order establishes ATO IAQ policy and replaces previous ATO IAQ guidance documents.

## Chapter 2. Roles and Responsibilities

**1. ATO Executive-level Managers** must ensure compliance with and incorporate the requirements of this order into programs and activities managed by their organizations, particularly those involving deployment of new systems and modernization projects that could impact IAQ.

**2. ATO Managers**. ATO Managers must:

**a.** Manage the requirements of and ensure compliance with this order.

**b.** Coordinate with Real Estate Contracting Officer to ensure that lease agreements and building conditions meet acceptable IAQ requirements as outlined in this order.

**c.** Complete the ATO Manager's IAQ Awareness training as required by this order.

**d.** Coordinate with the Project Manager/ Project Implementer to ensure that IAQ requirements, including appropriate engineering controls, are incorporated into all construction, renovation, demolition, installation, commissioning, and other modification projects managed by their organization.

**e.** Ensure the use of applicable work permits and the latest revision of ATO Order JO 3900.57, Environmental and Occupational Safety and Health (EOSH) Requirements in the Planning and Execution of Construction and Maintenance Activities at National Airspace System (NAS) Facilities for projects within their facility.

**f.** Ensure timely evaluation of IAQ concerns within their facility and promptly initiate necessary response actions. Ensure proper and effective preventive measures are performed to maintain acceptable IAQ as required by this order.

**g.** Coordinate with the ATO Safety and Health Specialist, assigned to support their organization, regarding IAQ issues and incidents.

**h.** Ensure that employees who have responsibility in addressing and managing ATO IAQ issues receive IAQ awareness training as required by this order.

**i.** Ensure records of IAQ incidents, reports, and corrective actions are maintained.

**j.** Inform the ATO Safety and Health Specialist of IAQ incidents/water intrusion events and their statuses.

**k.** Ensure appropriate notification to bargaining units of IAQ incidents and projects potentially affecting IAQ in their facility.

**l.** Ensure that all project specifications and plans are reviewed to identify activities that may affect IAQ.

**m.** Ensure proper and effective preventive measures are performed to maintain acceptable IAQ as required by this order.

**3. ATO EOSH Services Group**. The ATO EOSH Services Group must:

**a.** Designate a national ATO IAQ Technical Lead.

**b.** Serve as the Office of Primary Responsibility (OPR) to revise this order.

**c.** Develop, disseminate, and revise IAQ guidance and/or policy documents as necessary to supplement this order.

**d.** Provide technical guidance, assistance, and requirements to all ATO organizations regarding IAQ.

**e.** Coordinate with and provide technical assistance to the Office of Safety and Technical Training (AJI) on IAQ training requirements for ATO employees.

**4. ATO Project Managers/Project Implementers**. ATO Project Managers/Project Implementers must:

**a.** Notify the ATO Safety and Health Specialist of all engineering packages associated with projects in staffed facilities and provide the engineering package to them as necessary.

**b.** Ensure the use of applicable work permits and ensure that ATO Order JO 3900.57 forms are completed.

**c.** Incorporate ATO IAQ requirements and appropriate engineering controls into all construction, renovation, demolition, installation, commissioning, and other modification projects they manage.

**d.** Review all project specifications and plans to identify activities that may affect IAQ and ensure that corrective measures will mitigate the IAQ concerns. Ensure that IAQ compliance costs associated with the project are included in project cost estimates.

**e.** Coordinate project planning with the responsible, geographical ATO Manager(s) and ATO Safety and Health Specialist.

**f.** Ensure that IAQ compliance costs associated with project-specific sampling, abatement, mitigation, or engineering control requirements are included in all cost estimates.

**g.** Apply High-Performance Sustainable Building (HPSB) guiding principles as required by the Federal Aviation Administration (FAA) in Leadership in Energy and Environmental Designs (LEED).

**5. ATO Safety and Health Specialists**. ATO Safety and Health Specialists must:

**a.** Serve as the geographical/organization IAQ technical point of contact.

**b.** Conduct IAQ-related activities as required by this order.

**c.** Review plans and specifications for all planned projects in staffed facilities that may affect IAQ.

**d.** Maintain records of IAQ incidents, reports, and corrective actions.

**e.** Complete the IAQ Awareness Training as required by this order.

**6. Employees**. Employees must:

**a.** Conduct their work operations in such a way that work does not create IAQ problems.

**b.** Not alter or hinder the operation of HVAC systems unless otherwise authorized.

**c.** Notify their supervisor or the ATO Safety and Health Specialist of IAQ concerns and water intrusion events in their respective work area(s).

**d.** Complete IAQ training as assigned.

## Chapter 3. Management of IAQ at ATO Facilities

**1. ATO IAQ.** The ATO will ensure acceptable IAQ is maintained in staffed ATO facilities.

**2. Investigation of IAQ Concerns.**

**a. Initial IAQ Site Investigation.** The initial IAQ site investigation will consist of an initial IAQ site assessment, followed by an initial IAQ site investigation if needed.

(1) Initial IAQ Site Assessment. Initiate an initial IAQ site assessment when IAQ related health concerns are reported. This initial assessment is limited in scope and includes a discussion with affected employees, a walkthrough inspection to identify obvious causes of reported problems, and an assessment of equipment and systems operating in the area that may be affecting building IAQ. The initial IAQ site assessment will be conducted by the ATO Safety and Health Specialist or their qualified designee. The initial IAQ site assessment may also be conducted by the ATO facility manager, who must report the findings to the ATO Safety and Health Specialist. The ATO facility manager must have completed the training as specified in Section 5 of this Chapter in order to conduct the initial IAQ site assessment. The results of the initial assessment will determine if further investigation is required by the ATO Safety and Health Specialist.

(2) Initial IAQ Site Investigation. If the initial site assessment reveals that an initial site investigation is needed, the ATO Safety and Health Specialist will conduct an initial site investigation following the requirements in sections (2)(a)(3) and (2)(a)(4) below. The ATO Safety and Health Specialist will use the results of this initial IAQ site investigation to determine if a detailed IAQ investigation is needed.

(3) Initial Screening Criteria. Initial screening criteria should include identifying visible mold growth or the presence of moisture intrusion on building materials, odors and potential contaminants generated from internal or external activities, and the presence of new furnishings or building materials.

(4) Initial IAQ Investigation Air Sampling Parameters. The following tables present generally acceptable target values of commonly identified and sampled parameters in IAQ investigations. Further investigation will be required if the measured values are outside of the target values.

**Table 1. Air Sampling Parameters for Initial IAQ Investigation**

| IAQ Parameter | Target Value [1] |
|---|---|
| Carbon dioxide ($CO_2$) | 700 ppm[3] above outdoor air |
| Carbon monoxide (CO) | ND [2] (< 5 ppm) [3] |
| Relative humidity | 20 percent to 60 percent; Humidity ratio of between 0.0031 and 0.0124 [4] |
| Temperature | 68-82° F [5] |

**Notes:**

1 Target values are subject to change based on future revisions of standards and regulations.

2 ND = Not detected (use the value if the analytical instrument can detect to this level).

3 ppm = parts per million.

4 Humidity ratio is the mass of water vapor per unit mass of dry air. The range of 20 percent to 60 percent is provided for initial guidance. In some cases, 60 percent relative humidity may be required for the reduction of static charges on NAS equipment. However, sustained levels above 60 percent can lead to fungal growth. Reference: American National Standards Institute (ANSI) American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 55-2010, Thermal Environmental Conditions for Human Occupancy.

5 Temperature range is dependent on season, weather conditions, and time of day.

**Table 2. Humidity Ratio Levels**

| IAQ Parameter | Target Values | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temperature | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 |
| Target maximum relative humidity at 1.1 percent humidity ratio [1] | 75 | 72 | 70 | 67 | 65 | 63 | 61 | 59 | 57 | 55 | 53 | 52 | 50 | 48 | 47 |

**Notes:**

Temperature and relative humidity levels have a maximum target value of 1.1 percent humidity ratio level. Exceeding the target value may cause fungal growth from air moisture alone. When accessing IAQ parameters, evaluate conditions using information from this table. Temperature target values in the table are in F°.

**b. Detailed IAQ Investigations.**

(1) Detailed IAQ Investigations. If the initial IAQ site investigation results determine that additional investigation is needed, the ATO Safety and Health Specialist or their qualified designee must perform a more detailed IAQ investigation. The detailed IAQ investigation will progress in steps to include, as appropriate, a review of site background information, a building evaluation, an HVAC system evaluation, and sampling. The complexity of the situation will dictate the scope and determine if additional ATO or contracted technical expertise is required. When developing the scope of work for the detailed evaluation, include the following, where applicable:

(a) A history of the concern.

(b) Sample collection objectives.

(c) Sample locations and frequency.

(d) Sample collection equipment, methods, and procedures.

(e) Sample handling, transporting, and analytical testing methods and certification (e.g., an identification of the American Industrial Hygiene Association (AIHA) accredited laboratory used for the analysis).

(f) Inspection procedures for relevant components of the HVAC system (including building air intakes for entrainment of building, bathroom, or generator exhaust, or other contamination sources).

(g) An explanation of the comparison of sample results to applicable standards and criteria.

(h) A written report of findings and recommendations for corrective actions.

(2) Air Sampling Parameters for Detailed IAQ Investigation. Air sample collection and analysis will be based on site-specific concerns and at the discretion of the IAQ investigator. Potential sampling parameters are listed in the table below; however, this list is not comprehensive. Further investigation will be required if the measured values exceed the target values.

**Table 3. Air Sampling Parameters for Detailed IAQ Investigation**

| IAQ Parameter | Target Value [1] |
|---|---|
| Formaldehyde ($CH_2O$) | <27 ppb [4,6] |
| Hydrogen sulfide ($H_2S$) | ND (<0.2 ppm) [2,3] |
| Nitrogen dioxide ($NO_2$) | ND (<100 $\mu g/m^3$) [2,5] |
| Ozone ($O_3$) | ND (<50 ppb) [2,6] |
| Particulates (PM 2.5) [7] | (<15 $\mu g/m^3$) [5,9] |
| Particulates (PM 10) [7] | (<50 $\mu g/m^3$) [5,9] |
| Sulfur dioxide ($SO_2$) | ND (<80 $\mu g/m^3$) [2,5] |
| Total volatile organic compounds (VOC analytical) | <0.8 ppm [3,8] |

**Notes:**

1 Target values are subject to change based on future revisions of standards and regulations.
2 ND = Not detected (use the value if the analytical instrument can detect to this level).
3 ppm = parts per million.
4 Identified as "concentrations of interest" in ANSI/ASHRAE Standard 62.1-2013.
5 $\mu g/m^3$ = microgram per cubic meter of air.
6 ppb = parts per billion.
7 PM = particulate matter.
8 If outdoor concentrations are higher, use these as the target value.
9 Mean indoor particle levels should be less than mean outdoor levels.

## 3. Mitigation and Prevention of IAQ Concerns.

### a. Development of Control Strategies and Corrective Measures.

(1) A qualified Safety and Health Specialist will determine the proper control strategies and/or corrective measures once the investigation process identifies the source(s) of the IAQ problem(s). The ATO manager will coordinate with the responsible individual or organization for the implementation of corrective actions provided in the investigation report in accordance with FAA policy. Control strategies are characterized as:

(a) Source Control. Identify, control, and remove the pollutant sources where feasible. Ozone-forming equipment is not allowed in staffed ATO facilities for contaminant removal.

(b) Ventilation. To minimize the accumulations of contaminants, it may be necessary to modify the ventilation system to increase the quantity of outdoor air, or improve the air distribution. Outdoor air supply cannot exceed an HVAC system's ability to remove moisture (latent load). When adjusting the amount of outdoor air, exercise caution to ensure the HVAC system can maintain appropriate humidity levels. Modifications to the HVAC system must be coordinated with the responsible facility HVAC maintenance personnel.

(c) Filtration. Enhance existing or incorporate specialized filtration to remove specific pollutants from entering via the building supplied air ventilation system.

(d) Decontamination and Mitigation. Clean the HVAC system components or other source of contaminants as needed.

(e) Administrative Controls. Minimize the use of chemicals and other materials that could adversely affect IAQ. It may be necessary to relocate employees away from the area where the materials are used. Consider using these materials when the building is least occupied. Review safety data sheets (SDSs) for all chemicals prior to them entering the facility.

(2) Implement control measures for IAQ contaminants during construction, renovation, demolition, installation, commissioning, and other modification projects.

(3) Ensure corrective measures do not further adversely affect the building IAQ.

(4) Validate and document the effectiveness of the corrective measures.

**b. Preventive Measures.**

(1) Proper and effective preventive measures will have a positive impact on facility IAQ and reduce incidents. Preventive measures include:

(a) Maintain building equipment and HVAC systems as specified in FAA orders, maintenance technical handbooks (MTHB), and manufacturers' recommendations.

(b) Manage processes to eliminate or minimize the potential pollutant sources in the indoor environment.

(2) Proper and effective management of construction, renovation, demolition, installation, commissioning, and other modification projects:

(a) Review all construction processes and building operations prior to project initiation to identify potential impact to building IAQ.

(b) Identify and implement control measures for all activities generating dusts and odors in order to prevent contaminants from migrating into occupied areas of the building.

(c) Adhere to OSHA regulations and related FAA directives such as ATO Order JO 3900.57.

(d) Review and approve all contractors' SDSs for materials and chemicals prior to their use on site.

(e) Ensure that building mechanical systems are not disrupted during construction, which can adversely affect building IAQ. During construction activities, auxiliary heating and cooling may be required. During work activities, protect the HVAC systems from nuisance dust and contaminants.

(f) Potential air contaminants commonly identified on construction projects can include the following:

(i) Nuisance dusts and aerosols.

(ii) Regulated materials such as asbestos and lead, which require specific work practices identified in regulations and FAA directives.

(iii) Odors and other contaminants produced by construction materials and activities.

(iv) Newly installed products that may adversely affect IAQ by releasing off-gas pollutants.

(v) Smoke, odors, and particulates generated by hot work and welding operations. These operations require work permits, as specified in FAA policies and procedures, and additional control measures.

(vi) Water infiltration and mold growth caused by temporary openings in the building envelope.

(vii) Condensation due to temperature differences in facilities without proper insulation.

(g) Appropriate housekeeping practices are important to maintaining facility IAQ. These practices involve cleaning methods and the use of products that minimize the introduction of pollutants into the building environment.

**4. IAQ Investigation Reports.**

**a.** At the completion of an IAQ investigation, generate a report of findings with any recommended corrective measures. The following persons must receive a copy of the IAQ investigation report:

(1) ATO facility management.

(2) ATO Safety and Health Specialist.

(3) Others responsible for implementing corrective actions.

(4) Facility bargaining unit representatives, following collective bargaining agreements.

**b. Report Preparation.** The type of report generated depends on the complexity of the IAQ investigation and IAQ issues. When preparing the report, provide the following if applicable:

(1) Provide an executive summary identifying the reason for the evaluation. Include any health concerns noted by building occupants. It should also describe significant findings and provide a summary of recommendations.

(2) Describe the sampling methodology, sampling equipment used, and the sampling strategy. Include the limitations of sampling protocols and limits of detection for particular contaminants based upon the sampling method.

(3) Provide a discussion of site observations, survey findings, and an interpretation of data collected. Clearly reference the regulatory, consensus, or FAA standards used to interpret the data. Provide the following:

(a) Include all measurements obtained by direct-reading instrumentation in a format that clearly identifies the measurement locations, times, and results.

(b) Include laboratory analytical data in a format that clearly identifies the sampling locations, sample parameters, and the laboratory analysis results. Include laboratory accreditations.

(c) Include photographic documentation, if applicable, with descriptions of the photograph location and a narrative. Include the date and time for the photographs to assist in determining pre- and post-remediation conditions and provide scale if possible.

(4) Provide detailed recommendations for corrective actions of any deficiencies identified in the survey. Describe interim corrective measures implemented during the investigation to address the investigation's findings.

(5) Include any supporting documentation with the report. The supporting documentation must include chain-of-custody forms, laboratory analytical reports, direct-read instruments calibration certificates, field calibration documentation, and sample collection data. Documentation of equipment calibrations must follow the National Institute of Standards and Technology (NIST) primary reference standards.

(6) Provide a list of the names, roles, accreditation, licenses, company addresses, and phone numbers of the Certified Industrial Hygienist (CIH), Industrial Hygienist (IH), or other qualified Safety and Health Specialist that participated in the project and those that collected the samples.

(7) Document all quality control procedures conducted regarding project sampling.

**5. IAQ Training.** ATO employees must receive training consistent with their duties. The courses must meet applicable Federal regulations and FAA standards.

**a. ATO Manager's IAQ Awareness Training.** IAQ awareness training will be provided to all ATO managers and supervisors. This training is a pre-requisite for the two ATO IAQ awareness courses listed below.

**b. ATO Technical Operations Personnel IAQ Awareness Training.** IAQ awareness training will be provided to ATO Technical Operations personnel who design, construct or oversee projects at facilities and who perform maintenance on facility HVAC systems.

**c. ATO Safety and Health Specialist IAQ Awareness Training.** IAQ awareness training will be provided to ATO Safety and Health Specialists.

**d. Mold Inspection and Assessment Training.** Training is required for ATO employees who are responsible for assessing water intrusion and mold in the workplace and conducting mold sampling. The training provides instruction on interpreting sample results leading to recommended solutions.

**e. Mold Remediation Supervisor Training.** Training is required for ATO employees who are responsible for conducting mold remediation projects or providing mold remediation project oversight.

**6. Recordkeeping.** Maintain IAQ records in accordance with FAA orders and regulations including 29 CFR 1910.1020. Retain these records in a manner that meets privacy and security requirements per FAA Order 1370.121 FAA Information Security and Privacy Program and Policy.

## Chapter 4. Mold

**1. Overview**. This chapter provides information and procedures for prevention of mold growth, and investigation and mitigation of mold concerns.

**2. Prevention of Mold Growth**. Mold growth indoors can cause or exacerbate health effects in susceptible individuals. The ATO will respond promptly to water intrusion events in order to prevent mold from growing in ATO facilities.

**a. Response to a Water Intrusion Event.**

(1) Evaluating a Water Intrusion Event. Water sources from water intrusion events must be categorized to determine the associated risks and the sampling and response actions that need to be performed. The response actions must be appropriate for the category of the water source and the site-specific conditions. Categories of water can quickly degrade into higher categories due to contamination. Water sources are categorized by the Institute of Inspection, Cleaning and Restoration Certification (IICRC) S500 Standard and Reference Guide for Professional Water Damage Restoration as follows:

(a) Category 1 Water Source: Clean water from a sanitary source (e.g., water supply lines, rainwater, and snowmelt from rooftops).

(b) Category 2 Water Source: "Gray" water from an unsanitary source that contains some degree of contamination that could cause sickness or discomfort if consumed by humans (e.g., washing machine overflows, toilet overflows, and non-feces waters).

(c) Category 3 Water Source: "Black" water containing pathogenic agents that could cause disease or death if consumed by humans (e.g., sewage backups and overflows from beyond toilet traps, feces, floodwaters and groundwater intrusion).

(2) Work Procedure for Initial Response Measures Following a Water-Intrusion Event.

(a) Following a water-intrusion event, identify the water source, stop the water source from continuing to impact the building, and immediately initiate water extraction and drying efforts. Rapid response efforts typically prevent mold growth.

(b) After identifying the Water Source Category as described in Paragraph 2(a)(1) above, determine the risk and appropriate mitigation actions required for the specific water intrusion event.

(c) Once the water source is identified, take action to prevent additional water damage. Certain water leaks may occur over a long time and may not be identified when the water intrusion is initially noticed. Ensure that permanent fixes are in place prior to build-back and restoring building materials.

(d) Within 48 hours of water damage from clean water (Category 1) sources, dry all building materials to a moisture level at or below 15 percent, as measured with a moisture meter, so as not to support mold growth.

(e) Remove and discard all porous materials contaminated with sewage or other Category 2 or 3 water sources. Clean and disinfect contaminated non-porous material. Due to

the potential for human illness associated with sewage contaminated materials, additional Personal Protective Equipment (PPE) and work procedures will be required.

(f) If building materials are not sufficiently dried within 48 hours, contact an ATO Safety and Health Specialist or their qualified designee to determine if mold remediation is needed. Monitor all water damaged building materials until they are thoroughly dried to a moisture content at or below 15 percent. If unable to be thoroughly dried, remove and discard materials as ordinary construction debris. Remove and discard porous materials if visible mold growth is present. Non-porous materials with visible mold or that came into contact with contaminated water must be cleaned and thoroughly dried.

(g) Prior to impacting building materials, review asbestos containing material and lead based paint survey reports to ensure these and any other regulated materials, if present, are handled appropriately. Also, ensure that the fire rating will not been compromised by the work.

(h) The Environmental Protection Agency (EPA) does not recommend biocide use as a routine practice during mold remediation, although there may be instances where Safety and Health Specialists judgment may warrant the use of biocides. Contact the ATO Safety and Health Specialist for proper use and application of biocides.

**3. Investigation of Mold Concerns.**

**a. Mold Assessment.**

(1) Water damaged building materials not thoroughly dried within 48 hours must be assessed to determine if the materials must be removed, particularly if mold is present. The assessment must be conducted by the ATO Safety and Health Specialist or their qualified designee and must include the following:

(a) Classification of the water source.

(b) Determination of the likely duration of water intrusion (in hours, days, weeks, months, or years).

(c) Determination of the extent of wet or damaged building materials.

(d) Extent of visible mold present.

(e) Recommendation of interim measures until remediation and restoration operations can be initiated.

(f) Evaluation of potential project disruptions to the NAS, fire life safety, and other critical ATO operations as well as the health and safety of the building occupants.

(2) Preventive Measures for Identified or Suspected Mold. Once mold is identified or suspected, take preventive measures to minimize disturbance of affected materials that could cause mold spores to become airborne and negatively affect IAQ. Initiate corrective actions based upon the amount of mold present and other site-specific factors. The ATO Safety and Health Specialist must provide a Response Action Plan and the ATO manager must make notifications as required by the appropriate collective bargaining agreements.

(3) Control Measures. Some investigative and initial corrective activities, such as assessing potential mold and moisture sources inside wall cavities, may require control measures such as restricting access and performing particulate and dust control. The ATO Safety and

Health Specialist or their qualified designee will determine the appropriate control measures based on the site conditions and activities required.

**b. Sampling and Analysis.**

(1) Since mold remediation efforts are the same regardless of the type(s) of mold present, sampling is typically not necessary to characterize the mold. Sampling to characterize the mold may be necessary to provide information to medical personnel treating an individual diagnosed with adverse health effects that are potentially associated with occupational mold exposure.

(2) Mold Sampling Plan.

(a) A CIH or other qualified Safety and Health Specialist under the direction of a CIH must develop a written sampling plan providing sound justification when mold sampling is to be performed. An industrial hygienist or qualified Safety and Health Specialist under the direction of the CIH will collect samples and conduct visual post-remediation evaluations.

(b) The written sampling plan must include the sampling methodology to be used, the Laboratory's AIHA accreditation certificate, and the laboratory's address and phone number. Samples must be submitted for analysis to accredited AIHA Environmental Microbiology Laboratory Accreditation Program (EMLAP) laboratories.

(3) Laboratory Sample Results. A CIH or other qualified Safety and Health Specialist with experience in mold investigations must interpret the laboratory sample results. Copies of sample results and reports must be provided in accordance with ATO collective bargaining agreements.

(4) Unapproved Sampling Techniques. The following sampling techniques are not approved for use with respect to mold at ATO facilities at this time:

(a) Mycotoxin sampling.

(b) Interstitial wall sampling (e.g., Wall Check®).

(c) Settling plates.

(d) Total mold volatile organic compounds.

(e) Particulate counters.

**4. Mitigation of Mold Concerns (Response Actions).**

**a. Routine Maintenance and Cleaning Activities.** If visible mold growth is identified during maintenance activities, the ATO Safety and Health Specialist or their qualified designee will determine appropriate engineering controls or need for mold-remediation procedures. Removing a few ceiling tiles, replacing air-handling unit filters, and routine cleaning of HVAC components are not considered mold-remediation activities because they can be accomplished using minimal engineering controls and do not typically result in significant mold-spore disturbance if conducted properly.

**b. Minor Mold Remediation Projects.**

(1) Identifying a Minor Mold Remediation Project. Projects with less than ten (10) square feet of visible mold growth are typically considered minor remediation projects. Some minor mold remediation projects may have significant potential to release mold spores because of their location, type of material affected, airflow patterns, or other specific site conditions that may warrant additional controls beyond those provided in this section. The total amount of mold present shall not be divided into separate smaller areas to reduce the engineering controls, PPE, or need for post remediation evaluations. The ATO Safety and Health Specialist or their qualified designee will determine the appropriate response methods and which category of mold remediation to use.

(2) Work Procedures for Minor Mold Remediation Projects. Work procedures for minor mold remediation projects include the following:

(a) Moisture Identification and Repair. Identify and initiate temporary or permanent repairs of moisture-intrusion sources if possible to prevent continued water damage.

(b) Limited Engineering Controls to Minimize Dust. A containment may not be necessary to control mold spore migration on minor projects if mold affected building materials can be removed without disturbing the mold. Limited engineering controls include the use of wet methods, vacuums equipped with High-Efficiency Particulate Air (HEPA) filters, disposable polyethylene drop cloths, and the prompt cleanup and disposal of mold contaminated materials.

(c) Use of Appropriate PPE. Minor mold remediation projects are not anticipated to generate significant mold aerosols. Utilize respiratory protection consisting of an N95 (filtering face piece) disposable mask. Employees must be trained and obtain medical clearance prior to use of N95 disposable dust masks. Use goggles with no side vents or appropriate eye protection, and wear gloves to prevent skin contact.

(d) Removal of Affected Porous Materials. Remove materials intact whenever possible to minimize mold spores from becoming airborne. Place affected materials into disposal containers immediately after removal.

(e) Cleaning of Non-Porous Materials. Clean the remaining substrates and any other non-porous materials using HEPA vacuums and a detergent in water solution. Allow materials to dry thoroughly.

(f) Proper Waste Disposal. Place contaminated materials into airtight containers at the removal site. Prior to sealing the containers, evacuate excess air using a HEPA vacuum. HEPA vacuum or wet wipe the outside of waste containers immediately before transporting. Containers may be disposed of as ordinary construction debris if no regulated materials, such as asbestos, are present.

(g) Conducting a Post-Remediation Evaluation. Conduct a visual evaluation when the contaminated materials have been removed and the remaining materials have been cleaned and dried to ensure no visible mold growth remains.

(h) Correction of the Moisture Source. The source of the moisture that contributed to the mold growth must be identified and corrective actions taken to prevent additional water intrusion and prevent future mold growth.

(i) Build-back Restoration. Build back efforts should only begin after all the steps above have been completed and the repair of the moisture intrusion source has been determined to be completed and effective.

**c. Major Mold Remediation Projects (Non-HVAC).** The following section applies to major mold remediation projects that do not involve HVAC systems. See Section 4(d) below for HVAC mold remediation procedures.

(1) Identifying a Major Mold Remediation Project. Major mold remediation projects include one or more of the following conditions:

(a) Greater than 10 square feet of visible mold growth. The ATO Safety and Health Specialist will evaluate each project greater than 10 square feet and, based upon site conditions, determine if the project can be conducted using less stringent protocols.

(b) Suspected mold growth of an unknown quantity (e.g., water saturated gypsum wallboard or an internal water leak where the full extent of the impacted area is not visible).

(c) Mold growth or water damage resulting from a sewage contaminated or other unclean water source.

(d) Mold growth underneath wallpaper or other impervious coverings like fiber reinforced plastic (FRP).

(2) Work Procedures for Major Mold Remediation Projects. Work procedures for major mold remediation projects include the following:

(a) Designing the Major Mold Remediation Projects Project. A CIH or ATO Safety and Health Specialist must design the project using an ATO approved scope of work. The ATO Safety and Health Specialist must approve all contractor remediation specifications, SDSs and submittals prior to the start of the project.

(b) Using Engineering Controls to Prevent Mold Spore Migration. Engineering controls to prevent mold spore migration must include the following:

(i) Deactivate and Isolate the HVAC system: Isolate the HVAC system from the containment area with critical barriers.

(ii) Construct a Work Area Enclosure: Construct a work area enclosure with a decontamination chamber consisting of a minimum of two stages for all entrances and exits of people, equipment, and waste. The decontamination chamber must contain an air lock system to maintain negative pressure. The preferred air lock contains three chambers with four overlapping flap doors. However, if there is inadequate floor space, a two-chamber air lock may be used. Isolation barriers must be constructed using fire-retardant polyethylene sheeting or other appropriate materials.

(iii) Establish Negative Air Pressure: Establish negative air pressure within the containment using HEPA filtration equipment, discharging the exhausted air to the outdoors whenever possible. The number of negative air machines must be sufficient to create a negative pressure inside the containment enclosure in relation to the area outside the containment enclosure, taking into account conditions that could affect pressure relationships (e.g., elevators, exhaust fans, or other exhaust appliances).

(c) Using Appropriate PPE. Use appropriate PPE during all major mold remediation projects anticipated to generate significant airborne mold spores. At a minimum, PPE appropriate for these jobs must include the following:

(i) Respiratory protection consisting of a negative pressure air-purifying half-face respirator equipped with P95 or better filters. Employees who are required to use respiratory protection must be trained, fit tested and obtain medical clearance prior to use.

(ii) Goggles with no side vents, or other appropriate eye protection.

(iii) Disposable full-body coverall with head and foot coverings.

(iv) Gloves to prevent skin contact with mold during the removal process.

(v) Adequate fall protection PPE and procedures as needed.

(vi) Any other PPE deemed appropriate for the hazards present in the workplace.

(d) Removing Affected Porous Materials. Remove materials intact where possible to minimize airborne mold spores. Place affected materials into disposal containers immediately after removal.

(e) Cleaning Non-Porous Materials. Clean the remaining substrates and any other non-porous materials using HEPA vacuums and a detergent in water solution. Allow materials to dry thoroughly.

(f) Anti-Microbial Coatings. The application of anti-microbial coatings must not be for biocidal purposes but rather as a preventive measure on porous materials that were not removed as part of the remediation project. Apply the anti-microbial coatings after a thorough cleaning of the surface of the materials.

(g) Instituting Proper Waste Disposal. Place contaminated materials into airtight containers. Prior to sealing the containers, evacuate excess air using a HEPA vacuum. HEPA vacuum or wet-wipe the outside of waste containers immediately before transporting. Containers should be disposed of as ordinary construction debris if no regulated contaminants are present.

(h) Conducting a Post-Remediation Evaluation. Once the contaminated porous materials are removed and the remaining non-porous materials are cleaned and dried, the post-remediation evaluation must be conducted prior to the release of the work area. The evaluation criteria are presented in Subsection 4(e) of this chapter.

(i) Correction of a Moisture Source. The source of the moisture that contributed to the mold growth must be identified and corrective actions taken to prevent additional water intrusion and prevent future mold growth.

**d. Major Mold Remediation Projects in HVAC Systems.**

(1) Identifying a Major HVAC Mold Remediation Project. Any amount of visible mold growth on permanent components of HVAC systems or in air plenums is considered a major project. Mold remediation projects in HVAC systems or air plenums have a high probability of releasing mold spores into the air and can spread airborne mold spores to other areas of the building.

(2) Work Procedures for Mold Remediation Projects in HVAC Systems. Work procedures for mold remediation projects in HVAC systems include the following:

(a) Project Design. A CIH experienced in mold remediation must design mold remediation projects in HVAC systems or air plenums. The ATO Safety and Health Specialist or their qualified designee must approve all contractor remediation specifications, SDSs, and submittals prior to the start of the project.

(b) Engineering Controls to Prevent Mold Spore Migration. The interior components of the HVAC system, including ductwork extending to other areas of the building, must be isolated through the construction of critical barriers. The preferred air lock for an HVAC mold remediation project contains three chambers with four overlapping flap doors. However, if there is inadequate floor space, a two-chamber air lock system may be used. Construct isolation barriers using fire-retardant polyethylene sheeting or other appropriate materials. A containment system around the HVAC equipment is generally not required because the interior confines of the system define the work area. Engineering controls to prevent mold spore migration must include the following:

(i) Deactivation of the HVAC system affected by the mold remediation. This may require temporary HVAC units to provide cooling or heating for affected part of the facility to support employee or equipment required temperature parameters.

(ii) Creation of negative air pressure within the work area with negative air machines equipped with HEPA filtration and discharge of the exhausted air outdoors whenever possible. Negative air machines should be oriented to draw air toward the entrance to the work area and away from unaffected portions of the building.

(c) Use of Personal Protective Equipment. PPE for HVAC mold remediation projects must include, at a minimum, the same PPE used for a Non-HVAC mold remediation project as detailed in Section 4(c)(2)(c) of this chapter.

(d) Removal of Affected Porous Materials. Remove material intact whenever possible to minimize mold spore aerosols. Place affected materials into disposal containers immediately after removal.

(e) Cleaning Non-Porous Materials. Clean the remaining substrates and any other non-porous materials using HEPA vacuums and a detergent in water solution. Allow materials to dry thoroughly.

(f) Proper Waste Disposal. Place contaminated materials into airtight containers at the removal site. Prior to sealing the containers, evacuate excess air using a HEPA vacuum. HEPA vacuum or wet wipe the outside of waste containers immediately before transporting. Containers should be disposed of as ordinary construction debris if no regulated contaminants are present.

(g) Biocides. The EPA regulates the use of biocides in HVAC systems. Biocides must not be used in mold remediation projects in HVAC systems or air plenums unless specifically directed by the CIH in the project design documentation. The CIH must pre-approve the use of EPA-approved biocides in air-conveyance systems with the FAA. The application of a biocide must be conducted while the work area is under negative pressure. The negative air machines must be operated until no detectable odors are present following biocide application.

(h) Anti-Microbial Coatings. The application of anti-microbial coatings must not be for biocidal purposes but rather as a preventive measure on porous materials that were not removed as part of the remediation project. Apply the anti-microbial coatings after a thorough cleaning of the surface of the materials.

(i) Conducting a Post-Remediation Evaluation. A visual inspection must be completed to ensure all mold contamination has been effectively abated. Following a successful visual inspection, complete post-remediation sampling as specified by the CIH. The evaluation criteria are presented in Section 4(e) of this chapter.

**e. Post-Remediation Evaluation.**

(1) Criteria for Post-Remediation Evaluation. Use the following criteria for post-remediation evaluation in staffed facilities:

(a) Properly address the moisture source prior to the installation of new finishing materials.

(b) Ensure satisfactory completion of all aspects of the mold remediation's scope of work.

(c) Ensure removal of all debris and waste generated during the project.

(d) Ensure the containment enclosure is free of visible mold growth and the remaining materials are dry (less than 15 percent moisture content).

(e) Perform spore trap sampling for major remediation. See Section 4e(2) below for details.

(2) Spore Trap Sampling.

(a) Criteria for Spore Trap Sampling. Use the following criteria for spore-trap air sampling for major mold remediation projects:

(i) Inside Containment: Collect three samples, with additional samples for larger containments based on the CIH recommendation. For some of the smaller major mold remediation projects, three samples may not be necessary or feasible. In those situations, the CIH will determine appropriate number of containment and control samples.

(ii) Outside the Building Control: Collect a minimum of three samples.

(iii) Inside Building and Outside Containment Control: Collect a minimum of three samples inside the building, which are at least fifty feet (50) from the containment area.

(iv) Active Air Movement: Collect all inside containment samples while there is active air movement created by one of the following methods:

- Negative air machines drawing air into the containment and exhausting outside the containment.
- HEPA filtration machines re-circulating air in the containment.
- Release Criteria: Major mold remediation is complete when the following conditions are met:

- Total mold spore concentrations of each sample collected inside the containment are less than the highest control sample collected (outside the containment or outdoors whichever is highest).
- The concentrations of each individual mold types and species inside the containment (other than Aspergillus/Penicillium (ASP/PEN)) must be lower than or within 40 spores per cubic meter of air (sp/m3) of the highest control sample collected (outside the containment or outdoors, whichever is highest). A difference of 40 sp/m3 of air (comparisons of total or individual species) or less must be considered negligible and not be grounds for a post-remediation evaluation failure.
- The concentration of ASP/PEN spores inside the containment area must also be lower than or within 40 spores/m3 the highest control sample. Concentrations of ASP/PEN inside the containment of up to 200 sp/m3 or less will not be grounds for clearance failure regardless of control concentrations. If the concentrations of ASP/PEN inside the containment exceed 400 sp/m3 or greater, the clearance has failed, regardless of control sample results.
- If these conditions are not met, the mold remediation is incomplete, and the cleaning procedures may need to be repeated. If the release criteria are not met, consult with the CIH, ATO safety and health specialist, and if necessary the ATO IAQ Technical Lead to determine any additional steps to be taken.

(v) Laboratory Analysis: Submit all samples to an accredited AIHA EMLAP laboratory for analysis.

(vi) Reporting: Provide sample results as required by appropriate collective bargaining agreements.

## Chapter 5. Administrative Information

**1. Distribution**. This order will be distributed electronically. All ATO employees can access this order on the DMS website referenced in Section 3 of Chapter 1.

**2. Delegation of Authority**. The EOSH Services Group, AJW-23, is the OPR for ATO IAQ policy. The OPR resides under the Director of Air Traffic Control (ATC) Facilities (AJW-2).

**3. Authority to Change This Order**. As the OPR for ATO IAQ policy, the EOSH Services Group, AJW-23, is authorized to change the content of the ATO IAQ Order when necessary. The OPR will perform an annual review the ATO IAQ Order and provide updates as appropriate.

**4. Definitions**. The acronyms and terms used within this order are defined within Appendix A (Acronyms) and Appendix B (Key Terms and Definitions).

**5. Related Publications**. Those documents and publications having impact on and/or are related to this order are identified within Appendix C (Indoor Air Quality Standards).

# Appendix A. Acronym List

| Acronym | Definition |
|---|---|
| $\mu g/m^3$ | Microgram per cubic meter of air |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| AIHA | American Industrial Hygiene Association |
| AJI | Office of Safety and Technical Training (FAA organization) |
| AJW-2 | ATC Facilities (FAA organization) |
| AJW-23 | EOSH Services Group (FAA organization) |
| ANSI | American National Standards Institute |
| ASHRAE | American Society of Heating, Refrigerating, and Air Conditioning Engineers |
| ASP/PEN | Aspergillus/Penicillium |
| ATC | Air traffic control |
| ATO | Air Traffic Organization |
| CFR | Code of Federal Regulations |
| $CH_2O$ | Formaldehyde |
| CIH | Certified Industrial Hygienist |
| CO | Carbon monoxide |
| $CO_2$ | Carbon dioxide |
| COO | Chief Operating Officer |
| EMLAP | Environmental Microbiology Laboratory Accreditation Program |
| EOSH | Environmental and Occupational Safety and Health |
| EPA | Environmental Protection Agency |
| ETS | Environmental tobacco smoke |
| FAA | Federal Aviation Administration |
| FRP | Fiber-reinforced plastic |
| $H_2S$ | Hydrogen sulfide |
| HEPA | High-efficiency particulate air |
| HPSB | High-performance sustainable building |
| HVAC | Heating, ventilation, and air conditioning |
| IAQ | Indoor air quality |
| IH | Industrial hygienist |
| IICRC | Institute of Inspection, Cleaning and Restoration Certification |

| Acronym | Definition |
|---|---|
| LEED | Leadership in Energy and Environmental Design |
| $mg/m^3$ | Milligrams per cubic meter of air |
| MTHB | Maintenance technical handbook |
| NAS | National Airspace System |
| ND | Not detected |
| NIOSH | National Institute for Occupational Safety and Health |
| NIST | National Institute of Standards and Technology |
| $NO_X$ | Nitrogen oxide |
| $NO_2$ | Nitrogen dioxide |
| $O_3$ | Ozone |
| OPR | Office of primary responsibility |
| OSH | Occupational safety and health |
| OSHA | Occupational Safety and Health Administration |
| PEL | Permissible Exposure Limit (OSHA term) |
| PM | Particulate matter |
| ppb | Parts per billion |
| PPE | Personal protective equipment |
| ppm | Parts per million |
| SDS | Safety data sheet; formerly known as Material Safety Data Sheet (MSDS) |
| $SO_2$ | Sulfur dioxide |
| $sp/m^3$ | Spores per cubic meter of air |
| TLV | Threshold limit value (ACGIH term) |
| TMVOC | Total mold volatile organic compounds |
| VOC | Volatile organic compound |

## Appendix B. Key Terms and Definitions

| Term | Definition |
|---|---|
| Air sampling | The process of measuring the airborne concentration of a potential contaminant in a specific air volume in a stated period. |
| Anti-microbial coating | A coating- like a primer that offers lasting protection against mold growth. |
| Assessment | An evaluation to determine if an adverse IAQ condition exists or how the facility has changed due to an IAQ, moisture intrusion, or mold event. |
| Biocide | A substance, process, or chemical that limits the growth of or kills organisms like mold. |
| Carbon dioxide ($CO_2$) | A colorless, odorless, and incombustible gas present in the atmosphere and formed during respiration and combustion. Carbon dioxide is an indicator used to measure the balance between mechanically introduced outside air and occupant levels. |
| Carbon monoxide (CO) | A colorless, odorless, and highly poisonous gas formed by incomplete fuel combustion. |
| Category 1 Water | Clean water from a sanitary source (e.g., water supply lines, rainwater, and snowmelt from rooftops). |
| Category 2 Water | Also known as "Gray water" and is from an unsanitary source (e.g., washing machine overflow, toilet overflow, and non-feces). It contains some degree of contamination and could cause sickness or discomfort if consumed by humans. |
| Category 3 Water | Also known as "Black water" and is from a highly contaminated water source (e.g., sewage backups and overflows from beyond toilet traps, feces, floodwaters, and groundwater intrusion). It contains pathogenic agents that could cause disease or death if consumed by humans. |
| Certified Industrial Hygienist (CIH) | One certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene. |
| Commissioning | The process of verifying that new subsystems and equipment meet project requirements as intended and designed. |
| Containment | Demarcated isolation enclosure and any adjoining area where debris and waste from such work accumulates. A system of airtight, impermeable, permanent, or temporary barriers around a known contaminant to prevent its release into the air. |
| Employee exposure | The exposure to a contaminant that would occur if the employee were not using respiratory or other personal protective equipment. |

| Term | Definition |
|---|---|
| Environmental tobacco smoke (ETS) | Smoke from cigarettes, pipes, or cigars, the exhaled smoke from a smoker (second-hand smoke), and nicotine, chemicals, and the toxic mix of cancer-causing substances deposited on indoor surfaces by tobacco smoke (third-hand smoke). This includes by-products and vapors from electronic cigarettes. |
| Formaldehyde, ($CH_2O$) | A gas at room temperature, formaldehyde is colorless and has a characteristic pungent, irritating odor. It is an important precursor to many other chemical compounds, especially for polymers. Formaldehyde is used in many building materials and is present in most indoor environments. This air pollutant can be harmful to health. |
| High-efficiency particulate air (HEPA) filter | A filter with at least 99.97 percent efficiency in removing mono-dispersed particles 0.3 micrometers in diameter. |
| Humidity ratio | The amount of water vapor relative to dry air. |
| Hydrogen sulfide ($H_2S$) | A colorless, very poisonous, and flammable gas with the characteristic foul odor of rotten eggs. It often results from the bacterial breakdown of organic matter in the absence of oxygen, such as in swamps and sewers. This air pollutant can be harmful to health. |
| Industrial hygienist (IH) | A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards. |
| Interim measure | A method including selective removal, encapsulation, enclosure, or repair to allow the safe deferral of remediation efforts. |
| Investigation | A detailed examination of IAQ issues at a facility. |
| Mold | The terms fungal spores, fungi, microbial, and mold are often used interchangeably, but scientifically molds are types of fungi. Fungal spores grow when there is moisture and an organic food source and reproduce by releasing microscopic spores. |
| Negative pressure | A containment where there is less air pressure inside the work area than the surrounding spaces, allowing a minor breach in the containment to have airflow into the negatively pressurized containment. |
| N-95 particulate filtering facepiece respirator | Filters that are affective in capturing at least 95 percent of airborne particles and are approved by the National Institute for Occupational Safety and Health (NIOSH). |
| Nitrogen oxide ($NO_X$) | Toxic gases with a very strong odor that are produced by the combustion of fossil fuel. This air pollutant can be harmful to health. |

| Term | Definition |
|---|---|
| Non-porous materials | Building materials that will not readily absorb water and can be affectively cleaned and disinfected as long as they are not structurally compromised. |
| Ozone ($O_3$) | A gas with a characteristic odor found in atmospheric electrical discharges and formed in many industrial applications. This air pollutant can be harmful to health. |
| Particulate | Microscopic to very small pieces of solid or liquid matter suspended in the air that can be synthetic or naturally occurring. |
| Porous materials | Building materials that absorb water and cannot be effectively cleaned or decontaminated. |
| Post-remediation evaluation | The practice of verifying the acceptance of the contractor's work to demonstrate sufficient cleaning for re-occupancy. |
| Preventive maintenance | Regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems to maintain good working order. |
| Qualified Designee | A person designated by the Safety and Health Specialist who, through education, training, and experience, can perform IAQ assessments and identify control strategies to mitigate IAQ concerns. The qualified designee must meet the Safety and Health Specialist qualifications found in 29 CFR § 1960.2(s) and 29 CFR § 1960.25. The qualified designee may be a contractor hired by the ATO. |
| Remediation | Remediation includes both the identification and correction of the conditions that permit mold growth, as well as the steps to safely and effectively remove mold damaged materials. |
| Renovation | The modification of any existing structure or portion thereof. |
| Safety and Health Specialist | A person who, through education, training, and experience, can perform IAQ assessments and identify control strategies to mitigate IAQ concerns. Safety and Health Specialist qualifications are found in 29 CFR § 1960.2(s) and 29 CFR § 1960.25. The qualified designee may be a contractor hired by the ATO. |
| Staffed Facility | A workplace where employees are assigned a duty or reporting station. It generally has personnel present on any given workday. Examples include Air Route Traffic Control Center, Air Traffic Control Tower, SSC, District and other offices. |
| Sulfur dioxide ($SO_2$) | A toxic gas with a pungent smell formed in various industrial processes, in burning of sulfur-containing coal and petroleum, or released naturally by volcanoes. This air pollutant can be harmful to health. |

| Term | Definition |
|---|---|
| Visible mold growth | Mold that has colonized a substrate, formed fungal mycelia, growth structures, and spores to the extent necessary to be visible to the naked eye, and may include both active and dormant growth. |
| Volatile organic compounds (VOC) | Organic chemicals with a high vapor pressure that evaporate at room temperature and enter the air. An example is formaldehyde. VOCs are ubiquitous in products and nature and are known for their odors. This air pollutant can be harmful to health. |

## Appendix C. Standards

**1. Federal Agencies.**

**a.** The OSHA established occupational exposure limits. OSHA issues and enforces industrial workplace standards. While lacking specific IAQ standards for office environments, OSHA would likely defer to the General Duty Clause to address building IAQ issues. OSHA has published a guidance document OSHA Safety and Health Bulletin (SHIB) 03-10-10, A Brief Guide to Mold in the Workplace. Although not mandatory, it contains information that is useful in accessing mold concerns in workplaces. OSHA regulations covering topics that are directly applicable to this Order include:

(1) 29 CFR 1910.134, Respiratory Protection, and

(2) 29 CFR 1910.1200, Hazard Communication.

**b.** The EPA publishes primary and secondary standards for common outdoor airborne contaminants. The national primary standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public from outside pollutants. The secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of an outdoor pollutant. The EPA ambient air quality standards are published for ozone, respirable particulate matter (PM-10), fine particulate matter (PM-2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. The values in the EPA National Ambient Air Quality Standards used in the ANSI/ASHRAE ventilation standards are geographically determined to identify areas of the country where cleaning of outside air to be used for dilution ventilation would be necessary. They are not appropriate as comparison criteria for IAQ surveys, as many of them are determined by averaging the concentrations for long periods (one to three years in some cases).

**2. State and Local Regulations**. Several States and local municipalities develop and maintain regulations and guidance dealing with IAQ and mold. Some of these requirements may apply to ATO facilities.

**3. Applicable National Consensus Standards.**

**a.** The ASHRAE and ANSI are organizations that provides national consensus standards regarding HVAC. The most recent version of ANSI/ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality, governs IAQ ventilation recommendations in buildings. ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy, defines conditions "in which 80 percent or more of the occupants will find the environment thermally acceptable." The ASHRAE standards are national voluntary consensus standards. The standards are not Federally mandated limits but are based on recommended practices from a professional society of heating and air conditioning personnel. State and local building codes often adopt ASHRAE standards. Industry and Federal agencies generally accept these standards as a basis for evaluating building ventilation and frequently reference the standards in IAQ documents.

**b.** The ACGIH publishes threshold limit values (TLVs) being politically neutral, experimentally based, reasonably scientific, and comprehensive. TLVs are guidelines (not mandated) for occupational employee exposures. In 1970, OSHA's original permissible exposure limits (PEL) were actually adopted TLVs made into a standard. For that reason, numerous legal cases have successfully used TLVs as a compliance tool. However, TLVs are guidelines for industrial settings and not for office buildings. IAQ Safety and Health Specialists often use one-tenth the TLV as a standard for office setting indoor air quality.

**4. FAA Policy**.

**a.** The latest revision of FAA Order 3900.19, FAA Occupational Safety and Health Program, established the overall agency OSH policy.

**b.** The latest revision of ATO Order JO 3900.57, Environmental and Occupational Safety and Health (EOSH) Requirements in the Planning and Execution of Construction and Maintenance Activities at NAS Facilities.

**5. FAA Collective Bargaining Agreements**. The ATO will adhere to the provisions outlined in current applicable collective bargaining agreements concerning IAQ.

## Appendix D. Document Feedback Information

Please submit all comments in written form, include recommendations for improving this document, suggestions for new related subjects, and errors. Send these via email to:

To: Document OPR: Cheryl Mazzella-Anderson, AJW-233, Cheryl.Mazzella@FAA.Gov

Subject: ATO Order JO 3900.76, Management of Indoor Air Quality (IAQ) at Air Traffic Organization (ATO) Facilities – Document Feedback / Revision Suggestions

Please provide as much information as possible to the OPR, for example:

**a.** An error, procedural, or typographical item in paragraph _____ on page _____ should be changed to _____ (attach separate sheet as necessary).

**b.** In future revisions of this document, please include coverage on the following subject _____ (describe the specific language you want to add, include OSH regulatory references if applicable).

**c.** Include the following information for the OPR to respond appropriately:

**d.** Submitted by: _____.

**e.** Submission Date: _____.

**f.** Telephone: _____.

**g.** Routing Code: _____.

**h.** Email: _____.