

THE SHEET METAL INDUSTRY  
INTERNATIONAL CERTIFICATION BOARD

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# **INTERNATIONAL CERTIFICATION BOARD**

## **CERTIFICATION MANUAL**

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The Sheet Metal Industry International Certification Board  
8403 Arlington Blvd, Suite 100  
Fairfax, Virginia 22031

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# **PART 1**

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## **General Procedures and Requirements**





# 1 INTRODUCTION TO ICB CERTIFICATION

## 1.1 Definitions, Abbreviations and Acronyms

Certain terms, abbreviations and acronyms are defined in this section and are applicable to all sections of this manual.

### 1.1.1 Definitions

Certification ..... In the context of this manual it always refers to the ICB certification

Contractor ..... In the context of this manual it always refers to an ICB certified contractor

Manual ..... In the context of this document this refers to this document in its entirety.

Supervisor ..... In the context of this manual it always refers to an ICB certified supervisor. While employed by an ICB certified contractor, a supervisor is the person who is responsible for overseeing, coordinating and ensuring that projects are performed by ICB certified technicians in accordance with ICB procedures, including the ICB Code of Conduct, the ICB General Rules, and the specifications for each specialty section included in this manual.

Technician ..... In the context of this manual it always refers to an ICB certified technician

### 1.1.2 Abbreviations

CEU ..... Continuing Education Unit

FLS ..... HVAC Fire Life Safety

FLS\_L1 ..... HVAC Fire Life Safety Level One

FLS\_L2 ..... HVAC Fire Life Safety Level Two

IAQ ..... Indoor Air Quality

ICB ..... International Certification Board

ITI ..... The International Training Institute of the Sheet Metal Industry

NEMI ..... National Energy Management Institute

NEMIC ..... National Energy Management Institute Committee of the Sheet Metal Industry

TAB ..... testing, adjusting and balancing

TABB ..... Testing, Adjusting and Balancing Bureau

## 1.2 Purpose and Overview

This manual describes the process of how one can become an ICB certified contractor, supervisor or technician in a specialty area. Any questions regarding the certification process should be directed to ICB. Contact information is provided in [Section 1.6](#).

This document is divided in two major parts:

- Sections 1-5 describe the basic process and requirements for all certifications.
- Specialty certifications start with Section 6 of this Manual. The specialty sections provide additional information for specific certifications. These specialty competencies must be met in addition to the core requirements.

## 1.3 Amendment and Interpretation

ICB may at any time amend any part of this Manual and standards, procedures, proficiency requirements, application forms, lists, and other items to which this Manual refers. An amendment may change certification requirements, and may affect current certifications, renewals and/or new applications for certification.

ICB alone will interpret and administer its standards and procedures, including those set forth in this Manual. ICB may waive or modify any requirement at any time without notice. ICB's decisions are not subject to review.

ICB may at any time adopt, change or discard rules and guidelines for the ICB's internal processes with respect to various certification-related activities, and/or set standards for the certification process.

## 1.4 The Meaning of Certification

Certification is a statement that a contractor, supervisor or technician has met ICB's requirements for certification. The purpose of ICB's certification is to demonstrate that ICB Certified Contractors, Supervisors or Technicians are knowledgeable and skilled professionals.

To maintain the ICB Certification requires continued compliance with the ICB Code of Conduct, which states:

Each person certified by ICB or an ICB bureau will practice his or her profession consistent with the standards and procedures applicable to the certification, and the highest quality workmanship.

The full text of the Code of Conduct is listed in [Section 2.1](#).

## 1.5 Certification Documents

On certification ICB will issue the following:

- A certificate including:
  - ✓ Date of certification,
  - ✓ The name of the Technician Supervisor, or Contractor
  - ✓ Discipline
  - ✓ Other pertinent information

- For Technicians and Supervisors, the identification card with the following:
  - ✓ Name of the Technician or Supervisor
  - ✓ Expiration date
  - ✓ Individualized certification number
  - ✓ Discipline

The certification is valid for two years (see [Section 2.3](#)).

The technician may be issued an identification stamp when applicable. The technician must hold and use the stamp in accordance with the applicable *Integrity and Stamp Agreement*. Each certificate, card and stamp is paid for by and remains the property of ICB. A charge will be assessed to replace lost or damaged certification documents or stamps. Certification documents must be surrendered to ICB whenever ICB demands so. Misuse of, or misrepresentation concerning, any stamp or certificate may result in withdrawal of certification and repeal of the certificate, card and stamp.

Multiple specialty certifications may be reflected on a single identification card.

## **1.6 Contact Information**

Director of Certification  
International Certification Board  
8403 Arlington Blvd, Suite 100  
Fairfax, VA 22031  
Telephone: (800) 458-6525 (toll free)  
(703) 299-5646  
Email: [info@icbcertified.org](mailto:info@icbcertified.org)  
Website: [www.icbcertified.org](http://www.icbcertified.org)

## 2 GENERAL RULES

### 2.1 ICB Code of Conduct

The ICB has adopted a Code of Conduct which is stated on page 6. Every contractor, supervisor or technician must comply with the **Code of Conduct** as a requirement for maintaining certification. Violations of the **Code of Conduct** are grounds for suspension, withdrawal or non-renewal of certification.

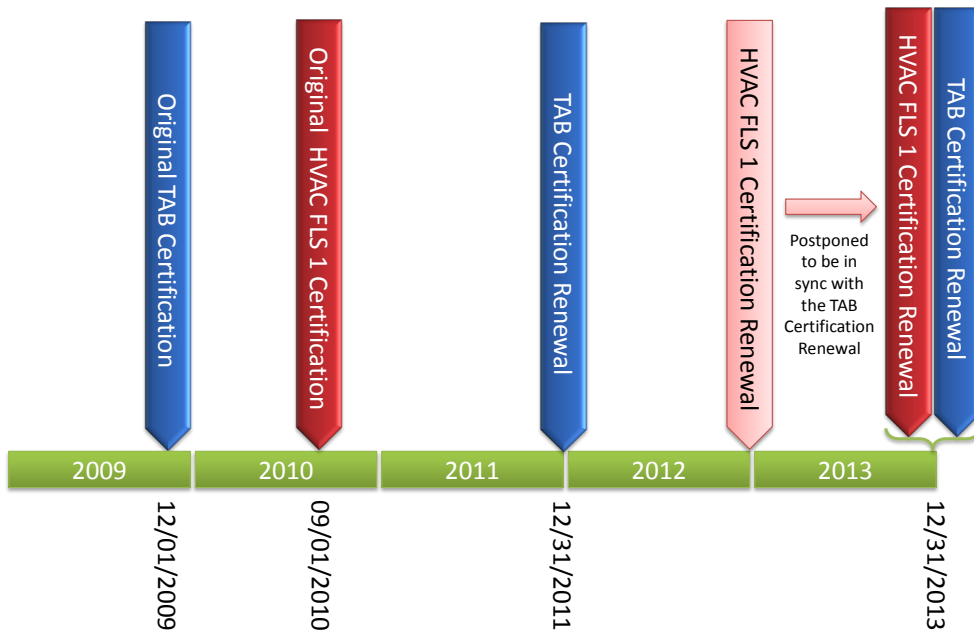
### 2.2 Testing and Certification Fees

ICB sets a schedule of testing and certification fees. For an up-to-date fee schedule, visit the ICB website at [www.icbcertified.org](http://www.icbcertified.org).

### 2.3 Duration of Certification

The ICB Certification expires on December 31<sup>st</sup> two years from the certification date unless noted otherwise in the specialty section. For example, the certification of an applicant who was notified on December 1<sup>st</sup>, 2009 would expire on December 31<sup>st</sup>, 2011.

The ICB may postpone the expiration date up to a year to synchronize expiration dates of two or more ICB certifications an applicant may hold. The following picture illustrates an example of such synchronization.



*This example demonstrates how ICB synchronizes two or more certifications to be renewed on the same date. In this example, the original TAB certification was issued on December 1, 2009. The TAB certification is then renewed on December 31<sup>st</sup>, 2011. A second certification in HVAC Fire Life Safety Level 1 (FLS 1) was issued on September 1<sup>st</sup>, 2010. Its renewal date would be December 31<sup>st</sup>, 2012. To synchronize the two certifications, the HVAC FLS 1 renewal is pushed back for a year to be in line the TAB one on December 31<sup>st</sup>, 2013.*

approximately 120 days before certification expires. The Renewal Application forms,

## GENERAL RULES

and all information required by those forms, must be submitted at least thirty (30) days before the certification expires.

At time of renewal the applicant must meet all qualifications and requirements as for initial certification.

### **2.5 Suspension or Withdrawal of Certification**

ICB reserves the right to suspend or withdraw the certification for any of the following reasons:

- Violation per [Section 2.7](#).
- Violation of the ICB Code of Conduct.
- A false or incomplete statement in the application for certification or renewal of certification, or otherwise in the application or renewal process.
- Failure to meet eligibility requirements of each specialty area the Technician, Supervisor or Contractor is certified in on an ongoing basis.

If ICB has reason to believe that any of the circumstances enumerated above existed when considering an application for renewal of certification, ICB may deny the renewal of certification.

### **The International Certification Board Code of Conduct**

Each person certified by ICB or an ICB bureau (all categories being "ICB professionals") is expected to practice his or her profession consistent with the standards and procedures applicable to the certification, and the highest quality workmanship.

#### **Certified Technicians and Supervisors:**

- ✓ ICB Certified Technicians will perform their work in an orderly, systematic, well-documented and repeatable manner.
- ✓ Certified Technicians will document all findings in an accurate and professional manner so that a Certified Supervisor can review a comprehensive and chronological history of the procedures followed.
- ✓ ICB professionals will not make any statements that cannot be substantiated and verified by field measurements or observations.
- ✓ Certified Technicians and Certified Supervisors should improve their technical competence through continuing education, peer counseling and interaction with professionals in their field of expertise.
- ✓ ICB professionals must meet standards and procedures as set by ICB, applicable to their particular certification(s), and adhere to all rules, regulations and obligations of the certification program.
- ✓ Certified Technicians will work in a professional manner so as to ensure their own safety and the safety of their fellow workers while being respectful to the property of the employers, building owner and his representatives.
- ✓ Certified Technicians will observe proper protocol when noting contract or installation deficiencies, errors or omissions by others. Notification should first go to the Certified Supervisor for review, then to the employer, unless the employer has established other protocol.

#### **Certified Contractors:**

- ✓ A Certified Contractor will ensure that a Certified Supervisor oversees and coordinates projects involving work in the area of certification (e.g., tab, sound & vibration, commissioning, IAQ, HVAC Fire Life Safety etc.), and that those projects are performed in accordance with standards and procedures.
- ✓ Certified Contractors must employ Certified Technicians and Certified Supervisors to the extent required for certification, and should seek to employ enough Certified Technicians and Certified Supervisors to perform all work in the area of certification (e.g., TAB, Sound & Vibration, Commissioning, etc.).
- ✓ Certified Supervisors and Certified Contractors shall only certify projects where the work was performed by certified technicians employed by their own firm.

#### **Protocol:**

- Violations of this code of conduct shall be reported to ICB.
- This code of conduct remains subject to change by ICB.

## 2.6 Certification-Related Objections and Complaints Procedures

### 2.6.1 Definitions

Claimant.....is the person making an **Objection** or **Complaint**.

**Complaints** .....include any complaint concerning work or conduct, such as a breach of the ICB **Code of Conduct** or other ICB standards; or use (or alleged misuse) of any certification documents, including an identification stamp if applicable.

Conference.....A meeting of the ICB with the parties to **Complaint** or **Objection** to determine the facts of the **Complaint** or **Objection**.

Decision.....is the written decision of ICB on any or all parts of any **Objection** or **Complaint** or an appeal.

Hearing.....A meeting of the ICB with the parties to **Complaint** or **Objection** to render a decision on the **Complaint** or **Objection**.

Investigation.....A fact finding mission by a representative aka investigator of the ICB to the physical place where the **Complaint** or **Objection** occurred.

**Objections** .....are either **Test-Related Objections** or **General Objections**

**Test-Related Objections** are objections by an applicant (including an applicant for renewal who is required to take any ICB test) that are in any manner related to the test itself, such as objections to physical or other arrangements at the test location, the manner in which the test was delivered and/or conducted, any test question, or any other matter which can be corrected or addressed at the time of the test, if known to the test proctor. Any objection to the manner in which a test is scored is not a **Test-Related Objection**.

**General Objections** are any objections by any applicant or technician other than a **Test-Related Objection**. **General Objections** may include, for example, objections about the conduct of any ICB representative or objections to an ICB decision (a decision as to certification, or otherwise).

Thus, an **Objection** is made by someone who seeks or holds an ICB certification concerning ICB actions or omissions. By contrast, a **Complaint** is made by someone else, or by ICB itself, with respect to work or conduct of the technician. ICB reserves the right to determine whether a grievance brought before it is an **Objection** or a **Complaint**.

Party to a **Complaint** refer to the Claimant and any Subject.

Report .....is the written document resulting from an investigation conducted in response to an **Objection** or **Complaint**.

Subject..... is the person or entity whose work, conduct or other action or omission is the subject of a **Complaint**.

### 2.6.2 Exclusivity

By submitting an application for ICB certification each applicant agrees that any **Objections** or **Complaints** will be resolved solely in accordance with the procedures as stated in this manual.

Figures 1 and 2 outline the basic process for a **Complaint** or an **Objection**, respectively.

### 2.6.3 General Rules on Required Deliveries and Time Limits for the Same

In the following rules, certain items, such as an **Objection**, must be in writing, i.e., they must be typed, printed or legibly handwritten.

Whenever a delivery time limit is given, i.e., the time period within which a document must have been physically delivered to the ICB, the requirement of the time limit will be met by any of the following conditions:

- The document has been delivered in person or by a courier service, such United Parcel Service (UPS) before the given time period expired; or
- The document has been delivered by the U.S. Postal Service and it is postmarked within the given time period

Electronic submission of an **Objection** or any other document requested by the ICB is not permitted.

### 2.6.4 Time Limits on Objections

Objections that are not made within the following time limits will not be considered and will be dismissed categorically:

- A **Test-Related Objection** must be made to the test proctor or any other ICB personnel or representative at the test site. If an applicant makes a **Test-Related Objection** at the test site and it is not addressed and resolved there, the applicant must submit the **Test-Related Objection** in writing to the ICB within ten days after the test date. Proctors are allowed to only resolve issues which are not related to the content of the test, e.g., room conditions, missing test items, etc.
- A **General Objection** must be asserted in writing within ten days after the Claimant first knows of the **Objection**.
- The **General Objection** must state in writing, in reasonable detail, the pertinent circumstances of and reasons for the **Objection**, and must be signed by the Claimant.



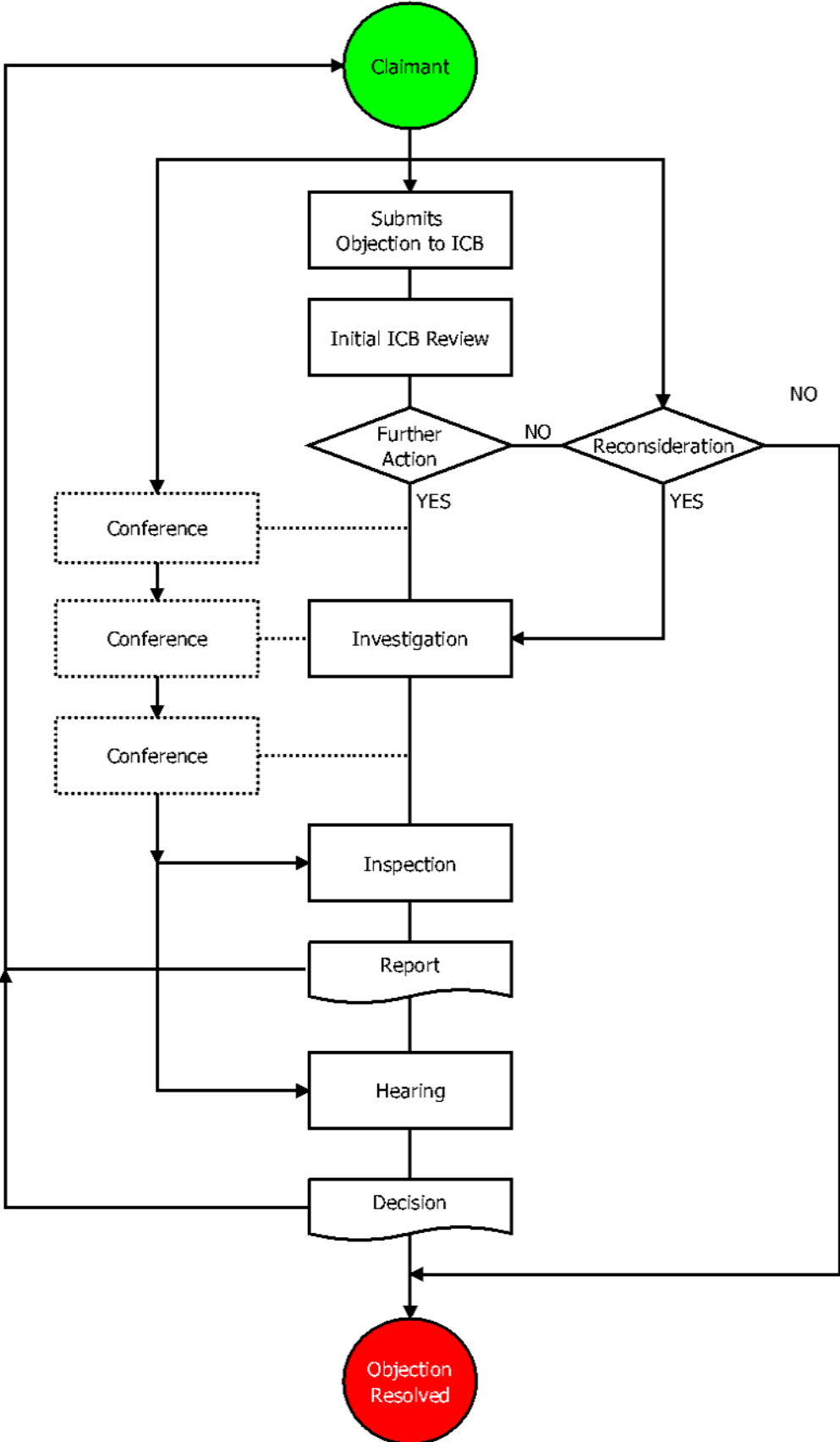


Figure 1. The basic process of resolving an **Objection** (see [Section 1.6](#) for contact information)

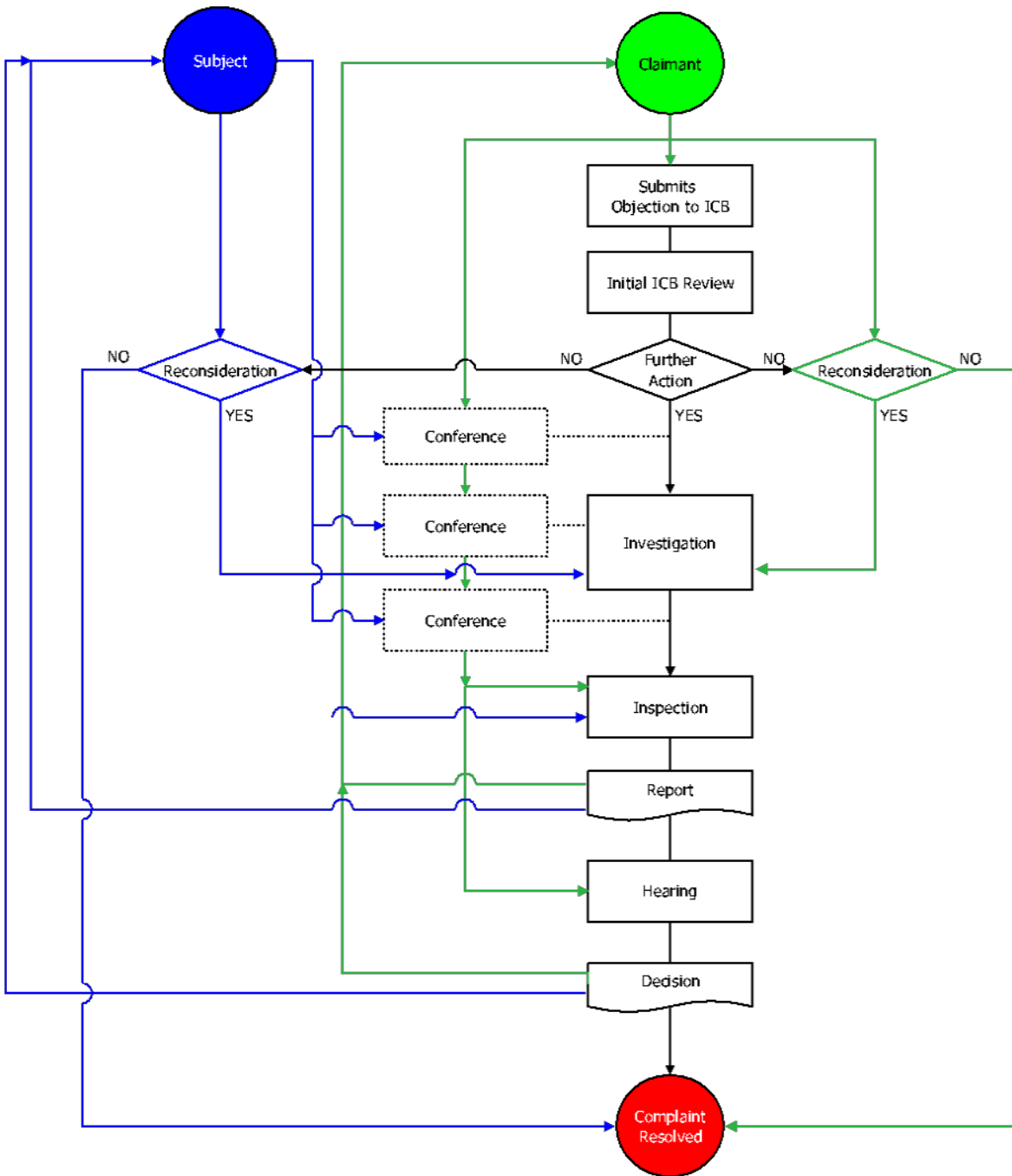


Figure 2. The basic process of resolving a **Complaint**  
(see [Section 1.6](#) for contact information)

### 2.6.5 ICB Procedures for Resolution of Objections and Complaints

The ICB will resolve any **Complaint** or **Objection** in accordance with the following procedures. ICB reserves the right to modify any particular procedure at any instance. The ICB will notify any materially affected party of such a modification in a timely manner but no later than ten (10) working days.

The ICB administrator or his or her representative will act for ICB on all matters concerning **Objections** or **Complaints**, including the conduct of a hearing, unless the Co-Chairs of the ICB or the full ICB determines otherwise.

**Test-Related Objections:** The proctor who oversees a test is authorized to resolve any **Test-Related Objection**.

**Initial Consideration of Objection or Complaint:** ICB will review the **Objection** or **Complaint** to determine if it merits investigation or further action. An ICB representative may contact the Claimant to clarify any aspects of the written **Objection** or **Complaint** or to obtain further information.

If an Objection or Complaint is not dismissed after the initial review, ICB may call one or more informal conferences with the Claimant and any Subject. A conference may be called prior to an investigation, or during or after an investigation. A conference may be called for any of the following purposes:

- To determine if any part or all of the **Objection** or **Complaint** can be resolved to the satisfaction of the Claimant and the Subject without need for an investigation and hearing;
- To determine if questions of fact can be resolved without need for investigation and/or hearing;
- To determine if the scope of the investigation can be agreed upon; and/or
- If a hearing is to occur, to determine the place, date and time of the hearing; set the amount of time allotted for the hearing; set the number of witnesses and/or exhibits that will be permitted at the hearing; determine what evidence must be submitted in advance of the hearing (and set the time limit for doing so); determine if written statements of position should be submitted in advance of the hearing (and to determine the time limit for doing so); and determine specific procedures and rules for a fair and efficient conduct of the hearing.
- To determine any other matters that may expedite the resolution of the **Objection** or **Complaint**.

The ICB reserves the right of final determination with respect to any of the above matters.

**Investigation:** If there will be an investigation, ICB will designate one or more investigators. The investigator shall contact the Claimant and any Subject. The investigator may inspect (or have inspected by a designated representative) the work to which the **Objection** or **Complaint** pertains. Reasonable notice of the date and time of any work site inspection shall be given both to the Claimant and any Subject. Both shall have an opportunity to be present. The inspector(s) can terminate the inspection if either the Claimant or any Subject interferes in any detrimental manner with the inspection. The inspector will prepare and submit a report of the investigation to the ICB, including any and all reasons should the inspection have been terminated due to interference by the Claimant and/or any Subject.

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ICB reserves the right not to release any or all parts of the Report to the Claimant and/or to the Subject. Generally, ICB will release to those persons all pertinent provisions of the Report. However, the ICB may not release any or all portions of the report if, for example, the ICB believes that such a release may jeopardize confidential information or trade secrets or may constitute publication of possibly defamatory statements.

**Hearing:** Following receipt of the Report, ICB shall give the Claimant and the Subject an opportunity to agree on a resolution. Absent an agreement, ICB shall conduct a hearing on the **Objection(s)** or **Complaint(s)**.

- The hearing will be held at a place of ICB's determination.
- At the hearing, the Claimant and the Subject will be given an opportunity to state their respective positions and to present evidence, all within the framework as set by the pre-hearing conference as described above.
- A party and any witness shall be allowed to be present by telephonic or video conference, if requested, and if ICB determines that practical arrangements can be made for telephonic or video conferencing.
- ICB may make a recording of the hearing.
- ICB shall determine who may attend a hearing.
- ICB shall determine all questions of procedure at the hearing. It may require witnesses to testify under oath administered by any duly qualified person. ICB shall determine the order of proceeding. ICB may limit the time anyone is allowed to speak or give evidence at a hearing, and may limit the number of persons who may testify at a hearing.

**Evidence:** ICB reserves the right to solely determine which evidence to be relevant and material to the **Objection** or **Complaint**. ICB may accept evidentiary statements by affidavit. To that end, ICB may require that any evidence submitted by affidavit be provided in advance of any hearing.

**Waiver of Rules:** A party who participates in any conference or attends a hearing and fails to object at the time of an action or omission, such party shall have waived any and all objection to the action or omission in question.

**General Principles:** ICB shall seek to ensure that investigations and hearings are conducted fairly and impartially, and in a manner that gives the Claimant and the Subject a reasonable opportunity to state their positions and to present relevant and material evidence in support of their positions. All proceedings (informal interviews or questions, conferences, investigations, hearings and any other proceedings) are to proceed in a civil and respectful manner, within time limitations and constraints as specified by the ICB. A person who is disruptive, defamatory or insulting, or who hinders any such proceeding, may be excluded from further participation in the proceedings. ICB may set time limits for a party to submit written statements of position, evidence or other material prior to or after a hearing, may require one or more pre-hearing conferences to settle procedural or other questions in advance of a hearing, and may reopen a hearing to consider further evidence or other information. Any decision by ICB on procedural questions with respect to a conference, investigation, hearing or any other proceeding shall be final, conclusive and binding to all parties participating in the matter which is under investigation.

### **2.6.6 Request for Reconsideration**

A person adversely affected by the initial decision of the ICB administrator or his or her representative regarding an **Objection** or **Complaint** may request reconsideration by the ICB Co-Chairs. If the ICB Co-Chairs decide to stay the initial decision by the ICB administrator as well, a request for reconsideration by the full ICB may be made by the adversely affected party. The request for reconsideration must be made in writing within 30 days after the date on which the Decision for which reconsideration is sought was mailed to the person making the request. The request must be accompanied by a copy of that Decision, and must state the reasons for reconsideration.

The ICB may deny the request for reconsideration or may grant the request and reconsider the Decision. Upon reconsideration, the Decision may be affirmed, modified in whole or in part, or reversed with directions to the ICB Administrator to take such action as the ICB determines to be appropriate.

The Decision on reconsideration will be mailed to the parties of interest.

## **2.7 ICB Decisions and Sanctions**

A Decision on the Objection or Complaint will be rendered following a hearing. The goal will be to render a Decision within 60 days following the date of the hearing.

ICB may assess reasonable costs and expenses in connection with proceedings on any Objection or Complaint (including a reasonable allocation of general overhead costs of ICB), as follows:

- Against the Subject of a Complaint if the ICB finds the Subject to have been at fault or to have acted in a manner inconsistent with ICB standards or the ICB Code of Conduct, or
- Against any person who ICB determines made or pursued an Objection, Complaint without merit and in bad faith.

If a specialty has a Quality Assurance Program, e.g. TABB, the ICB may direct a Subject to perform remedial work and/or assess all reasonable costs and expenses of work, which ICB determines to be appropriate to resolve the Complaint.

Any assessment under the preceding provisions may be made without regard to whether ICB takes any other action, or imposes any sanction, against or with respect to any person against whom costs and expenses are assessed. Any such assessment shall be paid on demand by the person against whom it is made. That person shall also pay all costs of collection of any such assessment, including reasonable attorney's fees. ICB shall have the right to recover any such assessment and all such costs of collection in an action in any court of competent jurisdiction, and ICB's costs in connection with any such action, including ICB's reasonable attorney's fees, also shall be paid by the person, as additional costs of collection.

Sanctions which the ICB may impose (in addition to an assessment of costs and expenses as stated above) may include one or more of the following:

- Verbal (informal) reprimand or warning;
- Written (formal) reprimand or warning;
- Limiting or conditioning the Subject's use of ICB qualification or certification, such as (by way of example within the specialty of TABB certification): (1) requiring the Subject to perform some or all testing, adjusting and balancing work, only under the supervision of another supervisor or contractor; (2) restricting the use of the Subject's ICB Certification or identification stamp, (3)

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imposing other limits or conditions on the Subject in respect of testing, adjusting and balancing work, or (4) requiring complete or limited re-testing; or

- Withdrawal of the Subject's ICB certification ("decertification") with the right to re-apply for certification after a period of time as set forth by the ICB.
- Permanent decertification.

By applying for ICB certification each applicant agrees to pay any assessment of costs and expenses in the event of an Objection or Complaint. The applicant further acknowledges that he or she may be subject to possible sanctions as stated above.

A Decision on any Objection or Complaint by the ICB shall be final, conclusive and binding to all interested parties.

### **3 THE CERTIFICATION PROCESS FOR TECHNICIANS**

#### **3.1 Certification Requirements**

ICB has determined to recognize and accept certifications by the ITI for the ICB certification program. ICB recognition and acceptance of technician certification extends only to a technician who meets all ITI requirements. Certification Process

To be an ICB Certified Technician, a qualifying technician must agree to be bound to:

- The ICB Code of Conduct
- The procedures and requirements as spelled out in this Manual

Furthermore, the ICB applicant must sign an Integrity and Stamp Agreement. If the technician does so, qualification documents will be issued by ICB. ICB has the right to withdraw ICB certification, pursuant to provisions contained in this Manual.

## 4 THE CERTIFICATION PROCESS FOR SUPERVISORS

### 4.1 Eligibility Requirements

To become an ICB Certified Supervisor, the applicant must:

- Be employed by a contractor signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and the employer is current with all financial obligations under that collective bargaining agreement.
- Meet all other ICB requirements and conditions of a Supervisor, as reflected on the ICB Supervisor application form.

### 4.2 The Certification Process

#### 4.2.1 Application

The whole application process is conducted online at [www.icbcertified.org](http://www.icbcertified.org). Online, the applicant must

1. Complete an ICB Supervisor application
2. Accept the ICB Code of Conduct, and
3. Submit the current certification fee per the ICB Fee Schedule.

ICB will notify the applicant of the action taken on the application. If the application is not accepted, the applicant may make an Objection as specified in [Section 2.6](#) of this Manual. .

#### 4.2.2 Supervisor Certification Testing

The Supervisor Certification examination (“Exam”) will consist of a written test intended to gauge how well the applicant understands and applies the ICB Proficiency Requirements of each specialty.

- The Exam will be administered by the ICB test proctor at sites designated by ICB.
- The Exam will be delivered, completed and returned (in print, electronic or other form)
- If a passing score had been achieved, ICB will notify the applicant in writing.
- If a passing score has not been achieved, the applicant will be notified in writing. The applicant may request a retest under the same application within one year from the notification date. The request for retest must be accompanied by the ICB retest fee.

#### 4.2.3 Supervisor Certification

Upon successful completion of the Exam, the Supervisor’s certificate and card will be issued. Certification has a fixed duration as stated in [Section 2.3](#) of this Manual. ICB has the right to suspend or withdraw ICB certification pursuant to provisions contained in this Manual.

ICB Certification alone does not authorize a Supervisor to sign reports as a Certified Supervisor, or otherwise use the certification. Signing reports or other use is authorized only during and in the course of qualifying employment.



### **4.3 Requirement of Qualifying Employment**

ICB Certified Supervisors may sign reports or otherwise use ICB certification only during and in the course of the Supervisor's employment by a ICB Certified Contractor and otherwise in compliance with ICB requirements. Loss of qualifying employment will result in indefinite suspension of the Supervisor's right to use ICB certification, until the earlier of: (a) the Supervisor's return to qualifying employment; or (b) expiration of the Supervisor's ICB Certification.

### **4.4 Renewal of Certification**

See [Section 2.4](#) of this Manual.

## 5 THE CERTIFICATION PROCESS FOR CONTRACTORS

### 5.1 Eligibility Requirements

ICB certification is offered for contractors who meet all of the following requirements:

- Signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement.
- Meets all eligibilities for each specialty requesting certification.

### 5.2 The Certification Process

#### 5.2.1 Application

The applicant must complete an ICB Contractor Application on [www.ICBcertified.org](http://www.ICBcertified.org).

The ICB will determine if the application establishes the contractor's eligibility for the ICB Certification. If the application is deemed deficient, the ICB will notify the applicant in writing. The applicant may correct the deficiencies by submitting a new application or submitting additional documentation as requested by the ICB. If the applicant disagrees with the determination of deficiency, the applicant may make an Objection pursuant to provisions of [Section 2.6](#) of this Manual.

If the ICB determines that the applicant meets the eligibility requirements, a site visit may be arranged by the ICB.

#### 5.2.2 Certification

If the ICB determines that the applicant has met all eligibility requirements, certification documents will be issued by ICB.

The ICB certification has a fixed duration (see [Section 2.3](#) of this Manual).

The ICB reserves the right to suspend or withdraw ICB certification pursuant to provisions contained in this Manual.

### 5.3 Applicants with Multiple Locations

A contractor is certified for one specific office only. If a contractor has multiple locations she or he may be certified for each separate or branch office. To obtain certification for a separate or branch office, both an ICB Certified Technician and an ICB Certified Supervisor must be regularly employed by the contractor at that specific office.

## **PART 2**

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# **Specialty Procedures and Requirements**



## 6 COMMISSIONING

### 6.1 Purpose and Overview

This Specialty Section states how one can become an ICB Certified Commissioning Supervisor or an ICB Certified Commissioning Contractor

### 6.2 Certified Commissioning Supervisor

#### 6.2.1 Eligibility

To qualify for the Commissioning Supervisor Certification, the applicant must be employed by a contractor signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and the employer is current with all financial obligations under that collective bargaining agreement and meets one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC commissioning work, OR
- Has a two (2) year associate degree in HVAC with at least three (3) years experience in HVAC commissioning work, OR
- Is an ICB Certified commissioning technician, OR
- Has at least three (3) years experience in HVAC commissioning work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### 6.2.2 Renewal of Certification

The following documents are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed six (6) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also Section 2.1 of this Manual).

#### 6.2.3 Acceptable CEUs

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to commissioning
- Any course sponsored by a local SMACNA chapter and related to commissioning
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Any course by the American Society of Heating, Refrigerating and Air-Conditioning Engineers on commissioning

- Teaching a course in commissioning for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to commissioning; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of commissioning. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; One (1) CEU will credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to commissioning

#### **6.2.4 Commissioning Supervisor Knowledge Base**

An ICB Certified Commissioning Supervisor must be proficient in all of the categories of this Section 6.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

##### **6.2.4.1 General**

A Certified Commissioning Supervisor must be knowledgeable about the various commissioning types, the associated processes and the commissioning steps.

##### **6.2.4.2 Agent and Authority**

A Certified Commissioning Supervisor must be knowledgeable about the role and responsibilities of the commissioning agent, the necessary skills and qualifications and describe the role and responsibility of the Commissioning Authority

##### **6.2.4.3 Levels of Commissioning**

A Certified Commissioning Supervisor must be knowledgeable about the different levels of the commissioning process.

1. Level 1
  - a. Preparation
  - b. Commissioning Plan
  - c. Pre Start Checks
  - d. Functional Performance Test
  - e. Operations Instruction and Demonstration
2. Level 2
  - a. Program or Pre Design Phase
  - b. Design Phase
  - c. Construction Phase
  - d. Acceptance Phase
3. Level 3
  - a. General
  - b. Critical Applications
  - c. Commissioning Organization
  - d. Level 3 Procedures

#### **6.2.4.4 Re-Commissioning**

A Certified Commissioning Supervisor must be knowledgeable about the re-commissioning process.

1. Preliminary Investigation
2. Survey and Documentation Phase
3. Surveys to confirm existing Documentation
4. Surveys to Produce New or Revised Documentation
5. Analysis
6. Modifications
7. Re-commissioning Test
8. Documentation and Training

### **6.3 ICB Certified Commissioning Contractor**

ICB Commissioning certification is offered to contractors who meet all of the following requirements. To be certified the Contractor must

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also [Section 5.1](#) of this Manual)
- Employ ICB Certified Commissioning Technicians and ICB Certified Commissioning Supervisors to the extent required for certification, and should employ enough ICB Certified Commissioning Technicians and ICB Certified Commissioning Supervisors to perform any and all work in the area of commissioning.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in Section 5 of this Manual.





## **7 HVAC FIRE LIFE SAFETY LEVEL ONE SPECIALTY**

### **7.1 Purpose and Overview**

This Specialty Section states how one can become an ICB Certified HVAC Fire Life Safety Level One Supervisor or an ICB HVAC Certified Fire Life Safety Level One Contractor. HVAC Fire Life Safety Level One certification addresses the installation, operation and maintenance of fire dampers, smoke dampers and combination fire-smoke dampers.

ICB Certified Technician status is available to HVAC Fire Life Safety Level One technicians who qualify per [Section 3](#) of this Manual.

### **7.2 Certified HVAC Fire Life Safety Level One Supervisor**

#### **7.2.1 Eligibility**

To qualify for the HVAC Fire Life Safety Level One Supervisor Certification, the applicant must be employed by a contractor signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and the employer is current with all financial obligations under that collective bargaining agreement and meets one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC installation or design work, OR
- Has a two (2) year associate degree in HVAC with at least three (3) years' experience in HVAC installation or design work, OR
- Is an ICB Certified FLS level one technician, OR
- Has at least three (3) years' experience in HVAC fire life safety work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### **7.2.2 Renewal of Certification**

The following documents are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed twelve (12) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also Section 2.1 of this Manual).

### **7.2.3 Acceptable CEUs**

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to FLS
- Any course sponsored by a local SMACNA chapter and related to FLS
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Any course by the National Fire Protection Agency (NFPA)
- Teaching a course in FLS for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to FLS; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of FLS. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; One (1) CEU will be credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to FLS industry

### **7.2.4 HVAC Fire Life Safety Level One Supervisor Knowledge Base**

An ICB Certified FLS\_L1 Supervisor must be proficient in all of the categories of this Section 7.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

#### **7.2.4.1 Design, Plans and Specifications**

A Certified FLS\_L1 Supervisor must be knowledgeable about the responsibilities of the architects, mechanical engineers and fire protection engineers including:

- Purpose of fire and smoke dampers for life safety and protection of property
- Terminology commonly used in conjunction with fire and smoke dampers.
- Symbols, definitions, and abbreviations commonly used on plans for HVAC systems
- Specifications for HVAC systems in SpecText and MasterSpec

#### **7.2.4.2 Basic Construction**

A Certified FLS\_L1 Supervisor must be knowledgeable of types of construction and the principals of fire resistant construction, structural protection, and fire and smoke containment by barriers

#### **7.2.4.3 Code Requirements**

A Certified FLS\_L1 Supervisor must be knowledgeable of the duties and powers of the "Authorities Having Jurisdiction" (AHJ) and codes

- Fire code
- Mechanical code
- Building code
- Life safety code

#### **7.2.4.4 Standards and UL Tests for Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of UL procedures for product testing

- Knowledge of testing procedure for rating dampers
- Listing
- Classification
- Component recognition
- Product labeling

A Certified FLS\_L1 Supervisor must be knowledgeable about damper testing and rating requirements as specified in

- UL 555 Fire Dampers
- UL 555S (Smoke) Damper
- UL 555C Ceiling Radiation Dampers

#### **7.2.4.5 Damper Installation Manuals and Guidelines**

A Certified FLS\_L1 Supervisor must be knowledgeable of various sources of damper installation manuals and guidelines from:

- SMACNA: Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems 2002
- AMCA: Publication 503-03 Fire, Ceiling (Radiation), Smoke and Fire/Smoke Dampers Application Manual
- Manufacturer's installation guidelines

#### **7.2.4.6 Features and Components of Fire Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of the process of fire damper selection including:

- Hourly fire resistance rating
- Operability
- Dynamic closure
- Mounting orientation
- Pressure drop
- Space envelope

A Certified FLS\_L1 Supervisor must be knowledgeable of the function of fire damper accessories:

- Sleeves
- Heat responsive devices
- Duct access doors
- Locking quadrants
- Mullions
- Blade position indicator
- Retaining angles

- Solenoid release
- Carbon dioxide (CO<sub>2</sub>) release

#### **7.2.4.7 Features and Components of Smoke Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of the process of smoke damper selection including:

- Leakage rating
- Temperature rating
- Operability under heat
- Flow and pressure
- Control function
- Actuating device

#### **7.2.4.8 Features and Components of Combination Fire/Smoke Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of the process of combination fire/smoke damper selection including:

- Hourly fire resistance rating
- Leakage
- Temperature and operational ratings
- Blade styles
- Space envelope

A Certified FLS\_L1 Supervisor must be knowledgeable of the various combination fire/smoke and smoke (leakage rated) damper accessories available including:

- Actuator
- Override package
- EP switch (electro-pneumatic or solenoid valve)

#### **7.2.4.9 Features and Components of Ceiling Radiation Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of the process of ceiling (radiation) damper selection including:

- Floor/ceiling or roof/ceiling assembly design
- Types of ceiling dampers
- Space envelope
- Mounting configuration

A Certified FLS\_L1 Supervisor must be knowledgeable of the function of ceiling (radiation) damper accessories:

- Thermal blanket
- Volume control/balancing devices
- Fusible links

#### **7.2.4.10 Installation Methods of Dampers**

A Certified FLS\_L1 Supervisor must be knowledgeable of the proper installation of dampers:

- Using illustrations provided by manufacturer
- Appropriate fire separation clearances
- Sleeves
  - ✓ Sleeve length
  - ✓ Sleeve thickness
  - ✓ Sleeve connection to duct
  - ✓ Damper attachment to sleeve
  - ✓ Rigid connection
  - ✓ Breakaway connection
- Actuators
- Retaining (mounting) angles
- Damper types
  - ✓ Rectangular
  - ✓ Round
  - ✓ Flat oval
- Airflow direction
- Access doors

#### **7.2.4.11 Damper Inspection and System Acceptance Testing**

A Certified FLS\_L1 Supervisor must be knowledgeable with regard to damper acceptance testing.

- System objectives
- Inspection
- Component testing
- Functional testing
- Performance testing
- Documentation

#### **7.2.4.12 Process of Repairing Dampers and Documentation**

A Certified FLS\_L1 Supervisor must be knowledgeable of periodic damper inspection mandates as well as maintenance and repair requirements

- Tools
- Safety procedures and safe work practices

### 7.3 ICB Certified HVAC Fire Life Safety Level One Contractor

ICB HVAC Fire Life Safety Level One certification is offered to contractors who meet all of the following requirements. To be certified the Contractor **must**:

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also [Section 5.1](#) of this Manual)
- Employ ICB Certified HVAC FLS\_L1 Technicians and ICB Certified HVAC FLS\_L1 Supervisors to the extent required for certification, and should employ enough ICB Certified HVAC FLS\_L1 Technicians and ICB Certified HVAC FLS\_L1 Supervisors to perform any and all work in the area of HVAC FLS.
- Have completed at least three HVAC Fire Life Safety Level 1 projects.
- Provide three references who can attest to your competence and integrity in HVAC Fire Life Safety work.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in [Section 5](#) of this Manual.

## 8 HVAC FIRE LIFE SAFETY LEVEL TWO SPECIALTY

### 8.1 Purpose and Overview

This Specialty Section states how one can become an ICB Certified HVAC Fire Life Safety Level Two Supervisor or an ICB Certified HVAC Fire Life Safety Level Two Contractor. HVAC Fire Life Safety Level Two certification addresses the installation, operation and maintenance of smoke management and smoke control systems.

ICB Certified Technician status is available to HVAC Fire Life Safety Level Two technicians who qualify per [Section 3](#) of this Manual.

### 8.2 HVAC Fire Life Safety Level Two Certified Supervisor

#### 8.2.1 Eligibility

To qualify for the HVAC Fire Life Safety Level Two Supervisor Certification Exam, the applicant must be an ICB Certified HVAC FLS Level One Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### 8.2.2 Renewal of Certification

The following documents are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed twelve (12) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also Section 2.1 of this Manual).

#### 8.2.3 Acceptable CEUs

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to FLS
- Any course sponsored by a local SMACNA chapter and related to FLS
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Any course by the National Fire Protection Agency (NFPA)
- Teaching a course in FLS for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to FLS; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of FLS. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; One (1) CEU will be credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to FLS industry

## **8.2.4 HVAC Fire Life Safety Level Two Supervisor Knowledge Base**

An ICB Certified FLS\_L2 Supervisor must be proficient in all of the categories of this Section 8.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

### **8.2.4.1 Design, Plans and Specifications**

A Certified FLS\_L2 Supervisor must be knowledgeable about the responsibilities of the architects, mechanical engineers and fire protection engineers:

- Purpose of smoke management systems for life safety and protection of property
- Purpose of fire and smoke dampers for life safety and protection of property
- Terminology commonly used in conjunction with smoke management systems and with fire and smoke dampers
- Symbols, definitions, and abbreviations commonly used on plans for HVAC systems, and life safety systems
- Ability to read and understand plans and specifications for HVAC systems and life safety systems

### **8.2.4.2 Basic Construction**

A Certified FLS\_L2 Supervisor must be knowledgeable of types of construction as defined by building codes, the principals of fire resistant construction, structural protection, fire and smoke containment barriers and occupancy classification by code.

### **8.2.4.3 Code Requirements**

A Certified FLS\_L2 Supervisor must be knowledgeable of the duties and powers of the "Authorities Having Jurisdiction" (AHJ) and knowledge of code requirements for smoke management systems and fire and smoke dampers installed in HVAC systems.

- Fire code
- Mechanical code
- Building code and awareness of occupancy design and current use
- Life safety code

### **8.2.4.4 Standards and UL Tests for Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of UL procedures for product testing

- Knowledge of testing procedure for rating dampers
- Listing
- Classification
- Component recognition
- Product labeling

A Certified FLS\_L2 Supervisor must be knowledgeable about damper testing and rating requirements in

- UL 555 Fire Dampers
- UL 555S (Smoke) Damper
- UL 555C Ceiling Radiation Dampers



#### **8.2.4.5 Damper Installation Manuals and Guidelines**

A Certified FLS\_L2 Supervisor must be knowledgeable of various sources of damper installation manuals and guidelines from:

- SMACNA: Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems 2002
- AMCA: Publication 503-03 Fire, Ceiling (Radiation), Smoke and Fire/Smoke Dampers Application Manual
- Manufacturer's installation guidelines
- International Code Council (ICC) (current editions):
  - ✓ International Building Code and its commentary
  - ✓ International Mechanical Code
  - ✓ International Fire Code
- ASHRAE (current editions):
  - ✓ ASHRAE Guideline Commissioning Smoke Management Systems
  - ✓ Principals of Smoke Management
  - ✓ HVAC Systems and Equipment Handbook
- NFPA (current editions):
  - ✓ NFPA 70 National Electrical Code
  - ✓ NFPA 80 Standard for Fire Doors and Other Opening Protectives
  - ✓ NFPA 90A Standard for Installation for Air Conditioning and Ventilation Systems
  - ✓ NFPA 92A Recommended Practice for Smoke-Control Systems
  - ✓ NFPA 92B Standard for Smoke Management Systems in Malls, Atria and Large Spaces
  - ✓ NFPA 101 Life Safety Code
  - ✓ NFPA 110 Standard for Emergency and Stand-by Power Systems
  - ✓ NFPA 221 Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls.
  - ✓ NFPA 5000 Building Construction and Safety Code
- Underwriters Laboratories
  - ✓ Directory, Fire Resistance, Volumes 1, 2A and 3.
  - ✓ UL 864 Standard for Safety Control Units and Accessories for Fire Alarm Systems
- ITI Manuals
  - ✓ HVAC Fire Life Safety, Level One Technician
  - ✓ HVAC Fire Life Safety, Level Two Technician
  - ✓ HVAC Fire Life Safety, Supervisor
  - ✓ Fans - Environmental Technician Module Series 2002

- ✓ TAB HVAC Systems Testing Adjusting and Balancing
- ✓ TABB Supervisor Home Study Course
- ASTM Standard E 814,2006

#### **8.2.4.6 Features and Components of Fire Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of the process of fire damper selection including:

- Hourly fire resistance rating
- Operability
- Dynamic closure
- Mounting orientation
- Pressure drop
- Space envelope

A Certified FLS\_L2 Supervisor must be knowledgeable of the function of fire damper accessories:

- Sleeves
- Heat responsive devices
- Duct access doors
- Locking quadrants
- Mullions
- Blade position indicator
- Retaining angles
- Solenoid release
- Carbon dioxide (CO2) release

#### **8.2.4.7 Features and Components of Smoke Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of the process of smoke damper selection including:

- Leakage rating
- Temperature rating
- Operability under heat
- Flow and pressure
- Control function
- Actuating device

#### **8.2.4.8 Features and Components of Combination Fire/Smoke Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of the process of combination fire/smoke damper selection including:

- Hourly fire resistance rating
- Leakage
- Temperature and operational ratings

- Blade styles
- Space envelope

A Certified FLS\_L1 Supervisor must be knowledgeable of the various combination fire/smoke and smoke (leakage rated) damper accessories available including:

- Actuator
- Override package
- EP switch (electro-pneumatic or solenoid valve)

#### **8.2.4.9 Features and Components of Ceiling Radiation Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of the process of ceiling (radiation) damper selection including:

- Floor/ceiling or roof/ceiling assembly design
- Types of ceiling dampers
- Space envelope
- Mounting configuration

A Certified FLS\_L1 Supervisor must be knowledgeable of the function of ceiling (radiation) damper accessories:

- Thermal blanket
- Volume control/balancing devices
- Fusible links

#### **8.2.4.10 Installation Methods of Dampers**

A Certified FLS\_L2 Supervisor must be knowledgeable of the proper installation of dampers:

- Using illustrations provided by manufacturer
- Appropriate fire separation clearances
- Sleeves
  - ✓ Sleeve length
  - ✓ Sleeve thickness
  - ✓ Sleeve connection to duct
  - ✓ Damper attachment to sleeve
  - ✓ Rigid connection
  - ✓ Breakaway connection
- Actuators
- Retaining (mounting) angles
- Damper types
  - ✓ Rectangular
  - ✓ Round
  - ✓ Flat oval
- Airflow direction

- Access doors

#### **8.2.4.11 Damper Inspection and System Acceptance Testing**

A Certified FLS\_L2 Supervisor must be knowledgeable with regard to damper acceptance testing.

- System objectives
- Inspection
- Component testing
- Functional testing
- Performance testing
- Documentation

#### **8.2.4.12 Process of Repairing Dampers and Documentation**

A Certified FLS\_L2 Supervisor must be knowledgeable of periodic damper inspection mandates as well as maintenance and repair requirements

- Record keeping
- Suitability of replacement or repair
- Manufacturer's Standard Operating Procedures
- Safety procedures and safe work practices

#### **8.2.4.13 Smoke Management Systems Manuals and Guidelines**

A Certified FLS\_L2 Supervisor must be aware of various sources of smoke management systems manuals and guidelines from:

- SMACNA
  - ✓ Fire Smoke and Radiation Damper Guide for HVAC Systems
  - ✓ HVAC Systems Duct Design
  - ✓ HVAC Systems - Applications
- AMCA
- ASHRAE
  - ✓ Commissioning Smoke Management Systems
  - ✓ Principles of Smoke Management Systems
- NFPA
  - ✓ NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems
  - ✓ NFPA 92A, Recommended Practice for Smoke-Control
  - ✓ NFPA 92B, Guide for Smoke Management Systems in Malls, Atria and Large Areas
  - ✓ NFPA 204, Guide for Smoke and Heat Venting
  - ✓ NFPA 252, Standard Methods of Fire tests of Door Assemblies
- International Building Code
- International Fire Code

#### **8.2.4.14 Features and Components of Smoke Management Systems**

A Certified FLS\_L2 Supervisor must be knowledgeable of the equipment and features of the smoke management systems:

- Fans: Type of fans and fan curves
- Doors
  - ✓ Capacity
  - ✓ Type
  - ✓ Fire rating
  - ✓ Mercantile occupancies
- Dampers
- Smoke Barriers
- Passive and active controls

#### **8.2.4.15 Knowledge of Smoke Management Systems**

- Electrical systems interface with smoke management
  - ✓ Regular
  - ✓ Emergency
- Fire Alarm Systems
  - ✓ Smoke Detectors in duct work
  - ✓ Sounds Alarms
  - ✓ Operate smoke control dampers
  - ✓ Activate fire suppression equipment
  - ✓ Active smoke control functions
- Energy Management Systems
- Automatic Sprinkler Systems
  - ✓ Sprinklers without air movement systems
  - ✓ Sprinklers with air movement systems
- HVAC Systems used active smoke control system

#### **8.2.4.16 Knowledge of Types of Smoke Management**

A Certified FLS\_L2 Supervisor must be knowledgeable of the types of smoke management systems

- Dedicated systems
- Non-dedicated systems
- Stairwell pressurization
- Elevator smoke control
- Zoned smoke control

#### **8.2.4.17 Smoke Control System Inspection and Acceptance Survey**

A Certified FLS\_L2 Supervisor must be knowledgeable of following subsystems to the extent that they affect the operation of the smoke-control system:

- Fire Alarm System
- Energy management system
- Building management system
- HVAC equipment
- Electrical equipment
- Temperature control equipment
- Power sources
- Standby power
- Automatic fire suppression system
- Automatic operating doors and closers
- Dedicated smoke-control systems
- Non-dedicated smoke-control systems
- Emergency elevator operation
- Stairwell Pressurization

#### **8.2.4.18 Test Equipment**

- Calibrated instruments to read pressure differences:
  - ✓ Differential pressure gauges
  - ✓ Inclined water manometers or electronic manometers
- Spring scale
- Anemometer
- Flow measuring hood
- Door wedges
- Hand tools
- Tool bag
- Screwdrivers
- Pliers
- Scratch awls
- Hand tongs
- Wrenches
- Hammer
- Aviation snips
- Drill motor
- Extension cord
- Ground fault for electrical cords

- Light
- Clip board and binder
- Safety equipment

#### **8.2.4.19 Safe Working Practices**

- Skills in the proper handling of tools
- Identification of unsafe working conditions.
- Confined spaces

### **8.3 ICB Certified HVAC Fire Life Safety Level Two Contractor**

ICB HVAC Fire Life Safety Level Two certification is offered to contractors who meet all of the following requirements. To be certified the Contractor must

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also Section 5.1 of this Manual)
- Employ ICB Certified HVAC FLS\_L2 Technicians and ICB Certified HVAC FLS\_L2 Supervisors to the extent required for certification, and should employ enough ICB Certified HVAC FLS\_L2 Technicians and ICB Certified HVAC FLS\_L2 Supervisors to perform any and all work in the area of HVAC FLS.
- Have completed at least three HVAC Fire Life Safety Level 2 projects.
- Provide three references who can attest to your competence and integrity in HVAC Fire Life Safety work.
- Perform any and all work in accordance with the most recent version of the *Fire, Smoke and Radiation Damper Installation Guide for HVAC* unless federal, state or local codes supersede it.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in Section 5 of this Manual.





## 9 INDOOR AIR QUALITY SPECIALTY

### 9.1 Purpose and Overview

This Specialty Section states how one can become an ICB Certified Indoor Air Quality (IAQ) Supervisor or an ICB Certified IAQ Contractor.

ICB Certified Technician status is available to IAQ technicians who qualify per Section 3 of this Manual.

### 9.2 Certified IAQ Supervisor

#### 9.2.1 Eligibility

To qualify for the IAQ Supervisor Certification, the applicant must be employed by a contractor signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and the employer is current with all financial obligations under that collective bargaining agreement and meets one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC installation or design work, OR
- Has a two (2) year associate degree in HVAC with at least three (3) years experience in HVAC installation or design work, OR
- Is an ICB Certified IAQ technician, OR
- Has at least three (3) years experience in HVAC work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### 9.2.2 Renewal of Certification

The following documents are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed six (6) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also [Section 2.1](#) of this Manual).

### 9.2.3 Acceptable CEUs

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to IAQ
- Any course sponsored by a local SMACNA chapter and related to IAQ
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Attendance of the Annual Indoor Air Quality Association (IAQA) Conference or any course/seminar offered during the event
- Any course by the Indoor Air Quality Association (IAQA)
- Teaching a course in IAQ for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to IAQ; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of IAQ. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; One (1) CEU will be credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to IAQ industry

### 9.2.4 IAQ Supervisor Knowledge Base

An ICB Certified IAQ Supervisor must be proficient in all of the categories of this Section 9.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

#### 9.2.4.1 HVAC Systems

- Air handler
  - ✓ Heating coils
  - ✓ Velocity measurement
  - ✓ Dampers
    - Outside
    - Return
  - ✓ Condensate pans
    - Drain pitch
    - Determining P-trap height
  - ✓ Chilled water coils
  - ✓ Filters
  - ✓ Minimum OSA measurement
  - ✓ DX coils
  - ✓ Static pressure profiling
- Package units

- ✓ DX coils
- ✓ Condensate pans
  - Drain pitch
  - Determining P-trap height
- ✓ Filters
- ✓ Dampers
  - Outside
  - Return
- ✓ Velocity measurement
- ✓ Minimum OSA measurement
- ✓ Chilled water coils
- ✓ Static pressure profiling
- Controls
  - ✓ CO<sub>2</sub> monitors
  - ✓ Thermostat
  - ✓ Humidistat
  - ✓ Building Automated Systems (BAS)
    - Direct Digital Control (DDC)
    - Pneumatic
  - ✓ Energy Management
  - ✓ Building Pressurization
- Hydronics. Major components identification
  - ✓ Chiller
  - ✓ Boiler
  - ✓ Pumps
  - ✓ Heat exchanger
  - ✓ Cooling tower
  - ✓ Control valves
  - ✓ Safety relief valves
  - ✓ Pressure reducing valve (PRVs)
  - ✓ Automatic vents
  - ✓ Access ports
  - ✓ Humidifiers
- Ductwork
  - ✓ Leakage
  - ✓ Cleaning

- Psychrometrics
  - ✓ Absolute humidity
  - ✓ Dew point
  - ✓ Chart
  - ✓ Winter and summer
- UV Lighting
  - ✓ Cooling coil applications
  - ✓ Upper room UV applications
  - ✓ Lamp selection
- HVAC system hygiene

#### **9.2.4.2 Health/IAQ**

- Productivity
- Volatile Organic Compounds (VOCs)
- Filtration
  - ✓ Minimum Efficiency Rating Value (MERV) rating
  - ✓ Particle
    - Sizes
    - Sources
    - Control
  - ✓ Pressure drop
- Sick Building Syndrome (SBS) vs. Building Related Illnesses (BRI)
- Air cleaning
  - ✓ Gases and odors

#### **9.2.4.3 Documentation**

- Data gathering
  - ✓ Tools for Schools (EPA)
  - ✓ I-Beam (EPA)
  - ✓ Prepare survey reports for technician
- Observation
  - ✓ Occupant complaints
  - ✓ Walk through
    - Inside
    - Outside
  - ✓ HVAC check list
  - ✓ Listening skills
  - ✓ Call in professionals

- ✓ Photographs
  - Photo logs
- ✓ Before and after repairs (if any)
- ✓ Building checklist
- Communication
  - ✓ Chain of command
  - ✓ Communication
    - Technician
    - Customer/ client
    - Design professional
- Interpret Plan & Specifications

#### **9.2.4.4 4. Testing Guidelines**

- Codes
  - ✓ Local
  - ✓ Model
- Standards of Care reference material
  - ✓ ASHRAE 62.1
    - Breathing zone
    - IAQ definitions
    - Ventilation rates
    - Air quality standards/guidelines
  - ✓ ASHRAE 62.2
    - Breathing zone
    - IAQ definitions
    - Ventilation rates
    - Air quality standards/guidelines
  - ✓ ASHRAE 55-2004
  - ✓ Acceptable ranges
    - Humidity
  - ✓ Temperature
- Federal guidelines
  - ✓ I-Beam (EPA)
  - ✓ Tools for Schools (EPA)

- Quality assurance: verify technicians
  - ✓ Have used instrumentation to manufacturer's guidelines
  - ✓ Have performed all testing and measurements according to industry standards and procedures

#### **9.2.4.5 5. Instruments**

- Particle meter
  - ✓ Size
  - ✓ Count
- Infrared Camera
- Voltage meters
  - ✓ Averaging
  - ✓ True RMS
  - ✓ Multi-meters
- Thermometers
  - ✓ Analog
  - ✓ Infrared
  - ✓ Contact
  - ✓ Digital
- Moisture meter
  - ✓ Intrusive pin-type
  - ✓ Non-destructive radiofrequency
- Borescope
  - ✓ Rigid
  - ✓ Flexible
- CO<sub>2</sub> meter
  - ✓ Range
  - ✓ Accuracy
  - ✓ Resolution
  - ✓ Response time
- Camera
- Calibration issues
  - ✓ Sensor range
  - ✓ Accuracy
  - ✓ Drift
  - ✓ Calibration
- TAB

### **9.3 ICB Certified IAQ Contractor**

ICB IAQ certification is offered to contractors who meet all of the following requirements. To be certified the Contractor must

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also [Section 5.1](#) of this Manual)
- Employ ICB Certified IAQ Technicians and ICB Certified IAQ Supervisors to the extent required for certification, and should employ enough ICB Certified IAQ Technicians and ICB Certified IAQ Supervisors to perform any and all work in the area of IAQ.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in [Section 5](#) of this Manual.





## **10 SOUND & VIBRATION SPECIALTY**

### **10.1 Purpose and Overview**

This Specialty Section states how one can become an ICB Certified Sound & Vibration Supervisor or an ICB Certified Sound & Vibration Contractor.

### **10.2 Certified Sound & Vibration Supervisor**

#### **10.2.1 Eligibility**

To qualify for the Sound & Vibration Supervisor Certification Exam, the applicant must meet one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC sound & vibration design work, OR
- Has a two (2) year associate degree in HVAC with at least three (3) years experience in HVAC Sound & Vibration work, OR
- Is an ICB certified Sound & Vibration technician and has five (5) or more years experience in HVAC installation or design work (which may include apprenticeship), at least one (1) of which must include Sound & Vibration work; OR
- Has at least three (3) years experience in Sound & Vibration work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### **10.2.2 Renewal of Certification**

The following steps are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed six (6) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also Section 2.1 of this Manual).

#### **10.2.3 Acceptable CEUs**

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to Sound & Vibration
- Any course sponsored by a local SMACNA chapter and related to Sound & Vibration
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Any course by the American Society of Heating, Refrigerating and Air-Conditioning Engineers on Sound & Vibration

- Any course by the Acoustical Society of America
- Teaching a course in Sound & Vibration for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to Sound & Vibration; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of Sound & Vibration. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; one (1) CEU will be credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to Sound & Vibration

#### **10.2.4 Sound & Vibration Supervisor Knowledge Base**

An ICB Certified Sound & Vibration Supervisor must be proficient in all of the categories of this Section 10.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

##### **10.2.4.1 Basics of Sound and the Assessment of Sound**

- Sound waves
- Types of sound waves
- Sound fields of spherical sound sources
- Source, path, and receiver
- Sound pressure, sound intensity, and sound power
- Decibels and levels
- Presence of background sound
- Weighting networks and octave and third octave
- Frequency bands
- How the human ear responds to sound
- Indoor sound criteria

##### **10.2.4.2 Mechanical Vibration**

- Vibration in buildings
- Fundamentals of vibration
- Vibration criteria
- Vibration isolation: one-degree-of-freedom systems
- Vibration isolation: two-degree-of- freedom systems
- Vibration isolators
- Structural isolations bases
- Curb bases
- Flexible connections
- Floating floors
- Floor constructions used to support mechanical equipment

- Equipment vibration isolation requirements
- Vibration isolation systems
- Vibration isolator selection
- Investigation of vibration problems
- Causes of structure- borne vibration problems

#### **10.2.4.3 Acoustical Design of Mechanical Systems**

- Sound levels
- System design guidelines
- Sound path design procedures
- Equipment sound data
- Fans
- Variable- air-volume (VAV) systems
- Rooftop curb- mounted air-handlers
- Airflow generated duct rumble
- Aerodynamically generated sound in ducts

#### **10.2.4.4 Mechanical Equipment Sound**

- Fans
- Refrigeration equipment
- Boilers and steam equipment
- Cooling towers
- Reciprocating engines
- Gas turbine engines
- Electric generators
- Electric motors
- Pumps
- Air compressors
- Electrical transformers

#### **10.2.4.5 Sound Generation and Attenuations Associated With Ducts and Fittings**

- Regenerated sound power associated with duct fittings
- Sound attenuation associated with duct elements
- Sound power breakout and breaking in ducts
- Insertion loss of external lagging on rectangular ducts

#### **10.2.4.6 Sound Transmission in Indoor and Outdoor Spaces**

- Sound transmission through ceiling systems
- Receiver room sound corrections
- Sound transmission through mechanical room walls, floor, or ceiling
- Sound transmission in outdoor environments

#### **10.2.4.7 Mechanical Equipment Sound and Vibration Specifications and Inspections**

- Mechanical equipment sound and vibration specifications
- Mechanical equipment sound and vibration isolation inspections

#### **10.2.4.8 Sound Instrumentation and Measurements**

- Sound measurement instrumentation
- Indoor sound measurements
- Outdoor sound measurements

#### **10.2.4.9 Vibration Instrumentation and Measurements**

- Vibration measurement instrumentation
- Indoor vibration measurements
- Locations for the vibration measurements
- Vibration measurements
- Assessment of indoor vibration measurements
- Report

### **10.3 ICB Certified Sound & Vibration Contractor**

ICB Sound & Vibration certification is offered to contractors who meet all of the following requirements. To be certified the Contractor must

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also [Section 5.1](#) of this Manual)
- Employ ICB Certified Sound & Vibration Technicians and ICB Certified Sound & Vibration Supervisors to the extent required for certification, and should employ enough ICB Certified Sound & Vibration Technicians and ICB Certified Sound & Vibration Supervisors to perform any and all work in the area of sound & vibration.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in [Section 5](#) of this Manual.

## **11 TESTING, ADJUSTING AND BALANCING SPECIALTY**

### **11.1 Purpose and Overview**

This Specialty Section states how one can become an ICB Certified TAB Supervisor or an ICB Certified TAB Contractor.

ICB Certified Technician status is available to TAB technicians who qualify per [Section 3](#) of this Manual.

### **11.2 Certified TAB Supervisor**

#### **11.2.1 Eligibility**

To qualify for the TABB Supervisor Certification Exam, the applicant must meet one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC installation or design work, OR
- Has a two (2) year associate degree in HVAC with at least three (3) years experience in HVAC installation or design work, OR
- Is an ICB Certified TAB technician and has five (5) or more years experience in HVAC installation or design work (which may include apprenticeship), at least one (1) of which must include testing, adjusting and balancing work;, OR
- Has at least three (3) years experience in TAB work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

Eligibility will be confirmed via the online application as outlined in [Section 4.2.1](#).

#### **11.2.2 Renewal of Certification**

The following steps are required to renew the Supervisor certification:

- Completed online renewal application. (See [Section 2.4](#) of this Manual).
- Documents showing that the Supervisor has completed twelve (12) hours of continuing education units (CEUs) in the past two years. The "Work for Hire" agreement form is also required if questions are submitted in lieu of four (4) CEUs.
- Signed copy of the ICB Code of Conduct. (See also Section 2.1 of this Manual).

#### **11.2.3 Acceptable CEUs**

One hour of training equals one CEU. CEUs will be accepted from the following:

- Any course endorsed by National SMACNA related to TAB
- Any course sponsored by a local SMACNA chapter and related to TAB
- Attendance of the Annual ICB/TABB Conference or any course/seminar offered during the event
- Any course put on by the National Energy Management Institute (NEMI) or the International Training Institute (ITI)
- Any course by the American Society of Heating, Refrigerating and Air-Conditioning Engineers on TAB

- Teaching a course in TAB for a local JATC at least twelve (12) hours per year
- Presenting a seminar on a topic related to TAB; a copy of the agenda and the presentation must be provided to receive credits
- Papers published on the topic of TAB. Six (6) CEUs will be credited per paper.
- Development of questions for the Supervisor Certification Test; one (1) CEU will be credited per four (4) questions submitted with a maximum of four (4) CEUs to be credited
- Any course or webinar related to TAB industry

#### **11.2.4 TAB Supervisor Knowledge Base**

An ICB Certified TAB Supervisor must be proficient in all of the categories of this Section 11.2.4 as demonstrated by passing the Written Test (see also [Section 2.4.4](#) of this Manual).

##### **11.2.4.1 Core Proficiency Requirements**

- Mathematics
- Fluid Flow
  - ✓ Pressure profiling
  - ✓ Pressure (static, velocity, and total)
  - ✓ Resistance (friction and dynamic loss)
- Heat Flow
  - ✓ Heat transfer including conduction, convection, and radiation
  - ✓ Temperature
- Psychrometrics
  - ✓ Dry bulb temperature
  - ✓ Wet bulb temperature
  - ✓ Dew point temperature
  - ✓ Relative humidity
  - ✓ Specific humidity
  - ✓ Specific volume
  - ✓ Density
  - ✓ Enthalpy
- Systems in General
  - ✓ Mechanical drawings
  - ✓ Specifications
  - ✓ Submittal data
  - ✓ Addenda and alterations
  - ✓ Shop Drawings
  - ✓ Schematics
- Automatic Control Systems

- ✓ Purpose for each component and how they interact
- ✓ Understand the sequence of operation
- ✓ Understand the operation of HVAC systems that are related to TAB
- Electrical Systems
  - ✓ Definitions of voltage, current, resistance, reactance, capacitance
  - ✓ Ohm's Law
  - ✓ Bhp
  - ✓ Safety
- Instrumentation
  - ✓ Select the proper instrument for the task to be performed
  - ✓ Properly care for and use the following listed instruments

#### **11.2.4.2 Preliminary Testing, Adjusting and Balancing Procedures**

- Initial planning
- Preliminary procedures
  - ✓ Procurement of data
  - ✓ Study of systems and data
  - ✓ Report forms
- Air distribution system inspection
  - ✓ Fans
  - ✓ HVAC units
  - ✓ Terminal unit/devices
  - ✓ Duct systems
- Hydronic distribution system
  - ✓ Pumps
  - ✓ Safety low water cut off
  - ✓ Pressure differential on heat exchanger
  - ✓ Coils and heat exchangers
  - ✓ Refrigeration equipment
  - ✓ Chilled water systems
  - ✓ Condenser and cooling towers pumps
  - ✓ Piping systems
- HVAC control system

### **11.2.4.3 Air System Testing, Adjusting and Balancing Procedures**

- Proportionate balancing
- Sequential balancing
- Specific Air System Procedures
  - ✓ Supply air systems
  - ✓ Return, exhaust and relief air systems
  - ✓ Dual duct and single duct (constant volume systems)
  - ✓ Dual duct pressure dependent systems
  - ✓ Variable air volume systems
    - Pressure dependent
    - Pressure independent
    - Induction
    - Fan powered terminals
  - ✓ Induction systems
  - ✓ Special systems
    - Laboratory fume hoods
    - Kitchen hoods
    - Industrial hoods
    - Material handling systems
    - Ceiling and floor plenum systems
    - Cleanrooms
- Considerations for Testing, Adjusting and Balancing
  - ✓ Problem solving
  - ✓ Customer relations
  - ✓ Safety
  - ✓ Data gathering
  - ✓ Report writing
  - ✓ Report review/editing/completion
  - ✓ Task scheduling
  - ✓ Reference Data



#### **11.2.4.4 Air Proficiency Requirements**

- Purpose for each component and how they interact
- Know the effect of duct leakage, resistance, and dynamic loss on balancing
- Know the function of the
  - ✓ Fan laws
  - ✓ System effect
  - ✓ V-belt drives
- Explain the function of component
  - ✓ Supply
  - ✓ Return/exhaust
  - ✓ Single-zone
  - ✓ Multi-zone
  - ✓ Reheat or recool systems
  - ✓ Induction boxes
  - ✓ Dual duct
  - ✓ Variable air volume
- Duct Leakage testing
  - ✓ Pressure drop test (degradation)
  - ✓ SMACNA Leakage testing method

#### **11.2.4.5 Hydronic**

- Explain the purpose of each component and how they interact
- Know the effect on balancing of system resistance, dynamic loss, system effects and foreign material in the system
- Apply pump laws
- Explain the function of component
  - ✓ Hot water heating
  - ✓ Two-pipe
  - ✓ Three-pipe
  - ✓ Four-pipe
  - ✓ Direct return
  - ✓ Reverse return
  - ✓ Chilled water
  - ✓ Condensing water
  - ✓ Variable flow systems
  - ✓ Primary - secondary system
  - ✓ Primary - secondary - tertiary system

- Explain the purpose of each component in a steam system and how they interact
- Hydronic System Testing, Adjusting and Balancing Procedures
  - ✓ Open system
  - ✓ Closed system
  - ✓ Two-pipe system
  - ✓ Three-pipe system
  - ✓ Primary - secondary systems
  - ✓ Primary - secondary - tertiary system
  - ✓ Differential pressure
  - ✓ Temperature difference

### 11.3 ICB Certified TAB Contractor

ICB TABB certification is offered to contractors who meet all of the following requirements. To be certified the Contractor **must**

- Be signatory to a collective bargaining agreement that provides for contributions directly to NEMIC, and is current with all financial obligations under that collective bargaining agreement. (See also [Section 5.1](#) of this Manual)
- Employ ICB Certified TAB Technicians and ICB Certified TAB Supervisors to the extent required for certification, and should employ enough ICB Certified TAB Technicians and ICB Certified TAB Supervisors to perform any and all work in the area of TAB.
- Own and maintain all TAB equipment and instruments per current TABB Instruments list, and maintain the required calibration.
- Perform any and all work according to the most current version of the SMACNA *HVAC Systems Testing, Adjusting and Balancing Manual* unless federal, state or local codes supersede it.
- Approve and adopt the TABB Customer Satisfaction Procedure.
- Have completed a minimum of three testing, adjusting and balancing projects.
- Furnish five (5) references from local architects, building owners, consulting engineers or contractors, who will vouch for the contractor's competence and integrity in testing, adjusting and balancing work.
- Pay application fee as specified by the ICB.
- Complete the certification process as outlined in [Section 5](#) of this Manual.

### **11.4 Independent ICB TABB Contractor Certification**

Certification as an Independent ICB Certified TAB Contractor is available to an ICB Certified TAB Contractor who affirms his or her independence by means of a sworn affidavit in a format as required by the ICB. An independent contractor is one with no affiliation with an HVAC mechanical contractor, design engineer, a manufacturer of HVAC equipment or with anyone else that interferes with the contractor's independence in any ICB certified specialty work on HVAC systems and/or in preparation of reports.

