Professional Certification
& Theatrical Technical Production

A Thesis

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By
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This document is dedicated to the parents of the child actors in the company of Maine State Music Theatre’s 1994 production of Annie 2. My staff and I should not have given you that scare.
**competent** (kəmˈpî-tənt) adjective

1. Properly or sufficiently qualified; capable: a competent typist.
3. Law. Legally qualified or fit to perform an act.

[Middle English, adequate, from Old French, from Latin competēns, competent-, present participle of competere, to be suitable. See compete.]

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1 From the American Heritage Dictionary, Second College Edition
Table of Contents

INTRODUCTION .........................................................................................................................................5

PART ONE - CERTIFICATION AND LICENSURE ...............................................................................7
  CERTIFICATION ............................................................................................................................... .................8
  LICENSES ...............................................................................................................................................13

PART TWO - CURRENT CERTIFICATION AND LICENSING IN THE THEATRE INDUSTRY 20
  DOMESTIC PROGRAMS ............................................................................................................................... ....21
    Licenses..............................................................................................................................................21
    Certification ..........................................................................................................................................41
  FOREIGN PROGRAMS ............................................................................................................................... 58

PART THREE - THE THEATRE INDUSTRY RESPONSE TO CERTIFICATION .........................71
  ACTORS EQUITY ASSOCIATION ......................................................................................................................72
  INTERNATIONAL ALLIANCE OF THEATRICAL STAGE EMPLOYEES ....................................................78
  COMMERCIAL THEATRE ............................................................................................................................... 84
  RESULTS OF THE CERTIFICATION SURVEY .....................................................................................................87
    Overview ................................................................................................................................................87

CONCLUSION .............................................................................................................................................133

APPENDIX A: SURVEY FORM ..................................................................................................................136

APPENDIX B: SURVEY RESPONDENT SAMPLE MAKEUP ..............................................................................142

APPENDIX C: RAW SURVEY RESULTS ....................................................................................................145

APPENDIX D: DIRECTORY OF SELECTED CERTIFICATION PROGRAMS ............................................................147

BIBLIOGRAPHY ...........................................................................................................................................150
Introduction

In theatre production, individuals often undertake tasks simply because they are the labor available. Currently the only indications of technical competence are experience, recommendations, union affiliation, and education. None of these are particularly dependable. Theatre technicians often vouch for their own skill level. The questionable validity of the peer reference limits a manager’s ability to verify skill levels (for hiring or for task assignment). Even an apparently reliable personal reference cannot establish competence with the certainty of a professional license or board certification. Union affiliation and education level can also be unreliable.

In other industries, many project participants are licensed or certified. Licensed architects design buildings. Licensed engineers detail their designs, and licensed electricians and contractors execute these details. Licensing and certification help to assure consumers a regulated quality of work, and assure managers a defined level of skill. Certification also provides governing bodies a means of assuring public safety. For a multitude of reasons, certification practices have evolved within industry over many years. Theatre could benefit by learning from this process.

The issue of certification divides the American theatre industry. Often technicians express their opinion, for or against, without knowing much about the subject. This thesis provides background information that should move this debate toward a reasoned and reasonable conclusion.

The thesis has three parts. Part One is a general introduction to certification and licensing. This section describes processes common to certification in many fields discusses the benefits of certification. Part Two details existing certification programs used by industries that have some overlap with theatre. Some theatre technicians currently hold these certificates. Others are programs for tasks often performed by theatre employees. The discussion begins with licensing and continues with industrial certification. The last section of Part Two describes theatrical certification programs from other countries. Although there are no such programs in the United States, there are theatrical certification programs abroad. These foreign programs are included to show how other technicians have already addressed many of these same issues. Part Three presents the results of a survey of theatre professionals. Technicians from all
levels of the industry responded to questions regarding certification issues. The survey presents feelings within the industry about hiring issues, such as educational consistency and the reliability of recommendations, as well as safety issues and issues of certification procedures.

The information should be of interest to all theatre professionals. Certification would have a great impact on managers and technicians. Any manager who has ever been unsure about a prospective employee’s capability can gain from this information. Any technician not quite sure of his or her own skills, and any producers or artists who have wondered if their facilities are as safe as they should benefit from learning more about certification. Much of the information that follows is applicable, whether a theatrical technical certification is developed or not. Furthermore, theatre technicians often perform tasks that fall into the jurisdiction of certified personnel. This process is not merely unsafe; these workers are potentially exposing themselves to fines and even imprisonment.
Part One - Certification and Licensure

This section deals with certifications and licenses in general terms. It begins with a discussion about certifications. The certification discussion includes reasons industries have certifications, and what workers gain from being certified. There is a description of the types of certifying bodies and of common certification practices. Following this presentation is a discussion of licensing in general. This section presents additional reasons that governments legislate licensing programs. It also includes a discussion of types of licenses, jurisdiction, and common licensing practices.

An obvious place to begin would be with definitions of certification and licensing. Unfortunately, there is no simple definition for either term. The best way to explain uses operational definitions, or descriptions of how each term is used in a specific example. Information of this type will follow in Part Two.
Certification

Reasons for Certification

Both management and labor have much to gain from certification. One of the greatest benefits is an increase in safety. Certification programs that verify workers’ knowledge of correct materials and procedures enable many industries to reduce the incidence of injuries and accidents.

Another benefit of certification is improvement in the quality of the work done. An individual who hires a certified worker can expect a given quality of work and the ability to verify worker skill raises the overall quality of work. Certification also establishes that there are “correct procedures” for their tasks. This minimizes waste and maximizes productivity as well as quality. This aggregate benefit is passed along to the public.

Certification also boosts worker confidence and self esteem. A certification program gives workers a scale against which to measure their skills. Workers can be more confident of their work when an independent agency has officially deemed them competent.

“... your certification recognizes your skills with a numbered certificate and a certification patch that can be worn on your work clothes, and demonstrates your efforts to achieve and maintain the highest professional proficiency available...”

In many cases, a certificate can be an important employment tool. By assuring a known level of competence, certificates can open doors to more opportunities. Holding a certificate may lead to more responsibility and better pay, and by demonstrating a worker's commitment to the field, might help a worker get a promotion.

Certification helps entire professional communities. By establishing a commitment to excellence, certification bolsters the standards for the entire work force. Workers in many industries use certification to improve their image in the public eye as well as in their own.

2 Fluid Power Society “Fluid Power Mechanic Certification” brochure
Some certificates serve as experience credentials. Eligibility requirements can allow workers with longer service to be recognized. A variant of this type of credential documents a particular combination of education and professional experience, establishing that a worker has not only completed a required level of education, but has also acquired a given amount of experience in the field.

Finally, certification programs support continued education and professional growth. Those that require continuing training and education for renewal help industries’ workers continue to mature. Any or all of these factors provide strong incentive for industrial certification programs.

**Certifying Organizations**

Many types of bodies that administer certification programs. Probably the most common is the professional organization. Professional organizations are voluntary membership groups, normally composed of people who perform the same type of job, or people who perform several jobs within the same industry. Often these groups decide that they should start a certification program, usually to increase safety, quality, or professional recognition. Normally, a subcommittee of the larger organization administers the program and the membership at large determines the rules and procedures involved.

Another body of groups that sponsors certification is made up of manufacturing organizations. Some companies administer certification programs regarding the use or maintenance one or more of their products. Such certification is occasionally safety motivated, but more often it is instituted to boost sales or to improve the quality of available operators. Occasionally, these programs double a professional organization’s certification program. For example: even though the ASE (the Institute for Automotive Service Excellence, a professional organization) certifies auto mechanics, many automotive manufacturers also provide training and certification programs designed specifically for their products. This practice also exists in other industries.

Employers represent still another source of worker certification. Some employers develop very specific in-house certification programs that deal with exactly the equipment their employees work with and the circumstances they work under.
Governments also develop certification programs. Although professional organizations or independent boards actually develop most of the programs administered by governments, legislatures sometimes specify the content of a particular program. This process is evident in many public safety certification programs, particularly those that deal with fire safety or pyrotechnics.

**Certification Practices**

The simplest certification practice is registration, the process of recording the names of everyone practicing a given profession. Obviously, this process does not measure competency.

A somewhat more rigorous practice is based on the evaluation of experience. This can be the simple gathering of recommendations, but it can also include recording educational history and professional experience. A common method for evaluation of experience allows for the mixing of many types of “credits” or “points”. The Project Management Institute’s *Project Management Professional* certification provides an example of a point system.

“... A candidate must display a professional commitment to project management through educational, work, and professional background... A point system is used to qualify candidates for certification. Candidates with less than the required number of points may still take the examination. The required point totals must be reached within seven years of passing the examination. Most categories have minimum and maximum point totals.

**Point examples:**
- 15 points for a bachelor’s degree (highest earned)
- 1 point per continuing education units
- 5 points per year employed as a supervisor of professionals
- 5 points for a paper published on project management”

Some certifying organizations regularly test candidates to determine their skill level. These tests can be in many forms. Some are written exams, usually multiple-choice, but in some cases open-ended or free-response. Other tests are practicals which

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3 Philip A Barnhart, *The Guide to National Professional Certification Programs*
Professional Certification & Theatrical Technical Production

require candidates to demonstrate their skills in person for a panel of examiners.

Several organizations exist to assist certifying bodies with testing and test development:

- American College Testing (ACT)
- Columbia Assessment Services (CAS)
- Educational Testing Service (ETS)
- Knapp & Associates (K&A)
- Professional Examination Service (PES)
- The Psychological Corporation

Most certification programs provide for continued development by requiring periodic recertification. In most cases certificate holders renew by providing evidence of continued practice within their specialty. Some groups further impose a point system requiring a given number of continuing-education or seminar points, etc. for renewal. By placing a limit on the length of certification, a certifying body fosters continued development within a work force.

**Certification Standards Groups**

Organizations have developed to assist professional certifying bodies in their work. Composed of members from the certifying bodies, these groups include the Council of Engineering Specialty Boards (CESB), the Council on Licensure, Enforcement, and Regulation (CLEAR), and the National Organization for Competency Assurance (NOCA). Each group maintains a membership directory and publishes newsletters. Each has committees that develop certification standards and procedures. This, for instance, is a list of CESB’s standing committees:

- Committee on Professional Engineering Specialty Certification
- Committee on Graduate Engineer Specialty Certification
- Committee on Engineering Related Specialty Certification
- Committee on Engineering Technician Specialty Certification

These standards groups also hold annual conventions, during which members meet to discuss certification issues. An upcoming CLEAR convention includes programming in four tracks: Credentialing & Exam Issues, Professional Discipline, Management & Administration, and Legislative & Policy Issues.

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4 Tracey S. Tillman PhD, 1995 Directory of Industrial and Engineering Certification Programs

5 CLEAR “Organizational Profile”
NOCA maintains a separate sub-organization called the National Commission for Certifying Agencies (NCCA).

“The National Commission for Certifying Agencies is an organization of organizations. NCCA was created in 1989 by the National Organization for Competency Assurance (NOCA) as a commission which will establish national voluntary standards for and recognize compliance with these standards by agencies certifying individuals in a wide range of professions and occupations”

The NCCA uses a voluntary standard to certify certification programs. The NCCA lists several advantages to certification accreditation. They include:

- Recognition that your program has met the highest national voluntary standards for private certification.
- Demonstrates to employees, peer organizations and government agencies that your certification program has been reviewed by an impartial commission and deemed to have met the nationally accepted criteria and guidelines of NCCA.
- Enhances the reputation of your certification program with certificants.
- Recognizes the highest level of professionalism for certification executives.
- Your accredited certification program will be listed in current and future NCCA and NOCA publications.
- Your certification program has a formal role in the development and future modification of NCCA accreditation criteria.
- Automatic membership (at no additional cost) in the National Organization for Competency Assurance (NOCA).

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6 NCCA Publication, “Background Information on The National Commission for Certifying Agencies (NCCA)”

7 NCCA Publication, “Background Information on The National Commission for Certifying Agencies (NCCA)”
Licenses

Most occupational licenses are issued by state governments. Each state has its own programs, and Connecticut’s programs are used as typical examples for this thesis. Most of the information for this section comes from correspondence with Richard M. Hurlburt, Assistant Director of the Occupational & Professional Licensing Division of the Department of Consumer Protection of the State of Connecticut. Additional information comes from the Connecticut State Code.

Jurisdiction - State and Federal Licenses

Although programs dealing with interstate commerce tend to be administered at the federal level, Federal, state and local governments all issue licenses. Federal licenses do not supersede the licenses required by other jurisdictions. An example of this follows in the discussion of pyrotechnic licenses.

State governments normally issue professional licenses. Each of the state licenses reviewed for this project allowed for reciprocity, the expedited licensing of persons holding licenses in other states.

Some professions have developed private organizations, such as the Architecture Institute of America (AIA), to help standardize licensing requirements from state to state. Another such organization is the National Council of Examiners for Engineering and Surveying (NCEES).

“As state registration laws were enacted and the mobility of engineers increased, intra-state registration problems began to develop. Increasingly, it became apparent that a national body was needed to coordinate information between the boards of registration. In 1920, the Council was founded by seven of the thirteen state boards having engineering and surveying registration laws. Council membership steadily increased as state boards and jurisdictions assumed legal status through legislation. When organized, the Council was given the name: Council of State Boards of Engineering Examiners…. In 1989 the name was revised to the National Council of Examiners for Engineering and Surveying.”

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8 NCEES History brochure
The NCEES has worked to develop a standard testing system for engineers and surveyors.

**Reasons for Licensing**

Mr. Hurlburt wanted to be very clear that the State’s reason for administering licenses was “more than just collecting a fee.”

Along with all the positive aspects that come from certification, there are other motivations for instituting licensing programs. The first is public safety. The government has a responsibility to protect the public. By setting standards for training and experience, as well as standards for practice, the state can help to insure the public’s well being.

Another governmental reason for licensing is consumer protection. The state can better police the companies doing business in its jurisdiction by using licenses. A state can limit the behavior of businesses and individuals with the threat of revoking their licenses. In this manner, consumers are assured that license holders will follow accepted procedures: that contracts will be used, that work will start and end on agreed dates, etc. The state can also place restrictions on the availability of licenses to insure that only healthy companies will receive them. This allows consumers to know a licensed entity will be able to handle a job of a given scope.

One of the overriding reasons for state licensing programs is to make business easier for the license holders. Without state licenses, every municipality could and probably would have their own individual licensing program. Under these conditions, a contractor who wanted to work in five towns would have to obtain and maintain five different licenses. State licensing programs unify local programs into one license which allows license holders to do business anywhere in the state.

One less obvious reason for state licenses is a guarantee of equal opportunity. State licensing programs work under all of the vigorously enforced anti-discriminatory programs. This process ensures that any person, regardless of race, religion, sex, or handicap, will have access to a license and the right to do business in the state. Private certifying agencies are more able to continue discriminatory practices, deliberately or inadvertently.
**Types of Licenses**

The State of Connecticut has programs for certification and licensing. From Section 21A-9 of the Connecticut State Code:

“(1) "Certificate" includes the whole or part of any department of consumer protection permit which the department issues under authority of the general statutes and which (A) authorizes practice of the profession by certified persons but does not prohibit the practice of the profession by others, not certified, (B) prohibits a person from falsely representing that he is certified to practice the profession unless the person holds a certificate issued by the department and (C) requires as a condition of certification that a person submit specified credentials to the department which attest to qualifications to practice the profession.

(2) "License" includes the whole or part of any department of consumer protection permit, approval, or similar form of permission which the department issues under authority of the general statutes and which requires (A) practice of the profession by licensed persons only, (B) demonstration of competence to practice by examination or other means and meeting of certain minimum standards and (C) enforcement of standards by the department or regulatory board or commission."  

From the above statute, the difference between certification and licensing is clear. Certification recognizes that an application process has been completed but persons who have not gone through this process are still permitted to practice. The definition also states that there has been no assessment of competence. A license, as defined above, allows only licensed people to practice and includes an assessment of competence.

This section of the State Code also allows for registration programs. These programs simply maintain a list of persons in a given profession. There is no exam. This applies to professions the state is tracking. No person may practice in these professions without first being registered.

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9 Conn. State Code, Section 21A-9
**Licensing Practices**

Many of the same practices that apply to certification also apply to licensing. In most cases, the legislation governing a certification will establish a governing board. For example:

“**Examining Boards.** There shall be in the department of consumer protection separate examining boards for each of the following occupations: (a) Electrical work; (b) plumbing and piping work ...

... The Electrical Work Board and the Heating, Piping and Cooling Work Board shall each consist of nine members who shall be residents of this state, one of whom shall be a general contractor or an unlimited contractor licensed for such operations under this chapter, two of whom shall be unlimited contractors licensed for such occupations under this chapter, neither of whom at the time of appointment shall be a member or an employee of a member of a trade union or a party or an employee of a party to a contract with a trade union, three of whom shall be unlimited journeymen licensed for such occupations under this chapter, who at the time of appointment shall be members of a trade union, and three of whom shall be public members...

...The contractor and journeymen or elevator craftsmen members of each board shall be appointed by the governor from a list of names submitted by employers’ and employees’ associations in the respective occupations. The governor may fill any vacancy occurring in the membership of any board, may remove any member for cause, after notice and hearing, and shall remove any licensed member whose license is not renewed or whose license has become void, revoked or suspended. Each member of each board shall, before entering upon the duties of his office, take the oath provided by law for public officers. Members shall not be compensated for their services but shall be reimbursed for necessary expenses incurred in the performance of their duties.”\(^{10}\)

The State Code also specifically outlines the duties of the board:

“**Powers and duties of boards.** Each examining board shall have a seal and its members may administer oaths in the performance of their duties. Each board shall keep a record of its proceedings and a complete roster of all persons licensed or registered by it and entitled to practice such occupation in this state. Each board shall biennially furnish a copy of such roster to each town clerk and shall notify such clerk of any deletions from such roster within five days of such deletion. The commissioner of consumer protection, with the advice and assistance of the appropriate board, shall have power to make all necessary regulations for the pursuit, practice and standards of the occupations within the jurisdiction of the

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\(^{10}\) Conn. State Code, Section 20-331
boards for the preservation of the public safety and shall, in such regulations, except as provided herein, establish the amount and type of experience and training required to qualify an applicant for examination for any license and shall determine the specific area of a trade for which limited licenses shall be issued and the areas for which no license shall be required. If, after hearing in accordance with the regulations established by the commissioner of consumer protection, it appears that the provisions of this chapter or the regulations issued pursuant thereto have been violated, in addition to the penalties hereinafter provided, a board shall report such violation to the office of the state’s attorney for the superior court for the judicial district in which such violation occurred.”

More simply put, the governor appoints a board of professionals with varied experiences and various affiliations. This board maintains a list of all licensed individuals. The Commissioner of Consumer Protection uses the board for advice on professional issues. The board must also monitor the licensed professionals, and report any violations to the appropriate authorities.

Testing

As stated above, state licensing programs require examinations. The content of the exams is developed by the appropriate board. The State of Connecticut has a three-year contract with an independent private company to administer all exams.

Renewal

Licensing programs have more specific policies regarding renewal than certification programs do. Most licenses are good for one year. Many programs are set up so that all the licenses of one type expire at the same time. License holders must renew within the period thirty days prior to expiration through thirty days following expiration. During this period, license holders apply to the appropriate board for renewal; they must also pay a renewal fee. After one month, expired licenses lapse, and must be renewed by completing the entire licensing process.

11 Conn. State Code, Section 20-332
Discipline

All boards have the right to revoke or suspend a license for cause. They also have the option not to renew an expired license, and to employ additional penalties at their discretion. These penalties include fines that may be levied against anyone working without a license, working with a license but in violation of professional rules, or knowingly hiring unlicensed personnel for jobs designated by the board to require a license.

Directory of Connecticut State Professional Licensing Programs

The State of Connecticut maintains many licensing programs. This is a list from the State Code:

- Healing Arts
- Medicine And Surgery
- Osteopathy
- Chiropractic
- Natureopathy
- Medical Examining Boards
- Podiatry
- Physical Therapists
- Occupational Therapists
- Substance Abuse Counselors
- Radiographers And Radiologic Technologists
- Midwifery
- Nursing
- Nurse's Aides
- Dentistry
- Dental Hygienists
- Optometry
- Opticians
- Respiratory Care Practitioners
- Pharmacy
- Psychologists
- Marital And Family Therapists
- Independent Social Workers
- Veterinary Medicine
- Massage Therapists
- Dietician-Nutritionists
- Embalmers And Funeral Directors
- Barbers
- Hairdressers And Cosmeticians
- Hypertrichologists
- Public Accountants
Professional Certification
&Theatrical Technical Production

- Architects
- Professional Engineers And Land Surveyors
- Real Estate Brokers And Salesmen
- Electricians, Plumbers, Solar, Heating, Piping And Cooling Contractors And Journeymen, Elevator And Fire Protection Sprinkler Craftsmen And Irrigation Contractors And Journeymen
- Subsurface Sewage Disposal System Installers And Cleaners
- Mechanical Contractor Organizations
- General Contractors And Major Subcontractors
- Television And Radio Service Dealers And Electronics
- Technicians
- Sanitarians
- Landscape Architects
- Interior Designers
- Ambulance Services
- Hearing Aid Dealers
- Speech Pathologists And Audiologists
- Home Improvement Contractors
- Asbestos Contractors And Asbestos Consultants
- Community Association Managers
- Lead Abatement Consultants, Contractors And Workers
- Home Building Contractors
- Real Estate Appraisers

These are just the licenses administered through the Department of Consumer Protection. The state also has programs through the Department of Public Safety, and the Department of Motor Vehicles.
Part Two - Current Certification and Licensing in the Theatre Industry

Part One explained general licensing and certification characteristics. Part Two will present several currently operating programs which may have a theatrical application. The discussion begins with programs operating in the United States. Following that there is a presentation of several theatre specific programs from countries abroad.
Domestic Programs

This presentation of existing programs begins with licensing and certification programs within the United States.

Licenses

License requirements often vary from state to state. This document is not intended to be a complete presentation of practices. To simplify this demonstration, unless otherwise stated, the licensing practices presented in this section are from the State of Connecticut. Each of the programs listed either has or could have relevance to workers in the theatre industry.

Licensed Professional Engineer

Professional Engineers’ licenses are administered by the Connecticut State Office of Consumer Protection. The engineering industry routinely uses these four terms interchangeably: licensed engineer, Professional Engineer (PE), Registered Engineer (RE), and Consulting Engineer (CE). The state code defines Professional Engineer as follows:

“(1) ‘Professional Engineer” means a person who is qualified by reason of his knowledge of mathematics, the physical sciences and the principles of engineering, acquired by professional education and practical experience, to engage in engineering practice, including the rendering or offering to render to clients any professional service such as consultation, investigation, evaluation, planning, design or responsible supervision of construction, in connection with any public or privately-owned structures, buildings, machines, equipment, processes, works or projects wherein the public welfare or the safeguarding of life, public health or property is concerned or involved;...”

State codes specify that the commissioner of the Department of Consumer Protection will be assisted by a board of examiners appointed by the governor. Section 20-300 of the State Code specifies that this board will have 12 members. Two members should be licensed Professional Engineers. The remaining members are licensed engineers and land surveyors, licensed land surveyors, and nonprofessionals. The board handles all

12 From the Connecticut State Code
issues concerning issuance, reassurance, suspension, or revocation of engineering licenses.

The National Council of Examiners for Engineering and Surveying (NCEES) is a standards organization that advises state engineering boards. An NCEES history describes the history of engineering licenses:

“The first registration law governing the practice of engineering and surveying was passed by Wyoming in 1907. The creation of this law was generated because of the many non-professionals practicing engineering and surveying. To end the abuse, a bill was introduced in the Wyoming legislature requiring registration of all engineers and surveyors. Despite the opposition, the bill passed and a new era in the regulation of engineering and surveying began. In a slow but steady progression, other states followed adding registration laws to their statutes. Today, all states and jurisdictions have laws regulating the practice of engineering and surveying.”

The NCEES was founded in 1920. Their constitution states:

“The purpose of this council should be to provide an organization through which state boards may act and council together to better discharge their responsibilities in regulating the practice of engineering and surveying as it relates to the welfare of the public in safeguarding life, health, and property.”

The NCEES has helped to standardize licensing practices from state to state. It is also instrumental in engineering competency testing. The Council lists several benefits of becoming a PE. Professional Engineers have greater job opportunity because their license demonstrates a high level of commitment to their profession. This same demonstration of commitment is also an aid to getting promoted. The NCEES also states that only PEs can consult in private practice or serve as expert witnesses in court.

Connecticut state law requires any person practicing engineering to be licensed. From section 20-302 of the State Code:

“No person shall practice or offer to practice the profession of engineering in any of its branches, including land surveying, or use any title or description tending to convey the impression that he is a professional engineer.”

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13 From an NCEES Press release
14 From an NCEES Press release
engineer or a land surveyor, unless he has been licensed or exempted under the provisions of this chapter...”

The code provides exemptions for persons working for licensed engineers, public utilities, and the federal government. There is also an exemption for licensed architects.

The requirements to become a licensed engineer in Connecticut begin with education. Applicants must have graduated from an approved school’s engineering program. In most jurisdictions this means that the school must have accreditation from the Accreditation Board for Engineering and Technology, Inc. (ABET). This requirement may be waived, at the discretion of the board, for an applicant with over 20 years of professional experience.

Applicants must also provide evidence of professional experience. The normal requirement is four years of active practice. There is no provision to waive this requirement. All applicants must also pay an application fee of $40.

The next requirement is the exam. The test has two parts, the FE (Fundamentals of Engineering) examination and the PE examination. The FE exam is an eight hour general engineering test. The test is multiple choice and has 70 questions. The questions cover science, mathematics, and engineering science. Here are two sample questions from the FE exam:

“A square wave of alternating voltage with RMS amplitude of 20.0 volts is applied across a 4.00-ohm resistor. The RMS is
(A) 1.77 A
(B) 3.18 A
(C) 5.00 A
(D) 7.07 A
(E) 10.0 A

Given the equation of a curve, differentiation can be used to determine all the following EXCEPT the
(A) slope
(B) concavity
(C) location of inflection points
(D) number of inflection points
(E) area under the curve between points”

15 Conn. State Code section 20-302
16 From How to Become a Professional Engineer Fourth Edition
The study guide does not present answers to the samples. Tests are graded on a one hundred point scale. Normally, about 70% of the applicants who attended accredited educational programs pass at each session. People who pass this exam are considered engineers-in-training.

After the FE exam, applicants take the PE exam. There are several different PE (Principles of Engineering) exams. These exams test applicants on their chosen specialty. Exams are available in these areas: Chemical, Civil, Electrical, Mechanical, Aeronautical/Aerospace, Agricultural, Control Systems, Fire Protection, and Industrial. There are also exams in these areas: Manufacturing, Metallurgical, Mining/Mineral, Nuclear, Petroleum, Structural I, Structural II, and Environmental. The PE exam is given over eight hours, in two four-hour sessions. In some specialties one of these sessions may contain multiple choice questions, others are composed of only free response questions. These questions are more complex. Here is a sample from the Civil Engineering exam:

“SITUATION: A W8x48 structural shape is placed on 5 foot centers to support a 4” slab [diagram]. Each beam consists of a 25 foot simply supported section. The n-ratio is 8. Concrete weighs 150 pcf. Concrete strength is 4000 psi.

REQUIREMENTS:
(A) Find the minimum uniform live load that can be placed on the slab.
(B) What is the ultimate moment for this construction design?”

And from the Mechanical Engineering exam:

“SITUATION: An air conditioned building is to be kept at 76°F and 50% relative humidity when the ambient conditions are 96°F db and 76°F wb. The total heat load is 150,000 BTUH, with the sensible load being 80% of the total. 800 cfm of outside air are conditioned to 58°F before entering the building.

REQUIREMENTS:
(A) Find the required flow rate.
(B) Find the humidity in grains per pound of supply air.
(C) Find the tonnage rating of the air conditioner.”

17 From How to Become a Professional Engineer Fourth Edition
18 From How to Become a Professional Engineer Fourth Edition
A raw score of 60% is required to pass the PE exam.

After passing both exams, the applicant pays a $110 fee and receives a license. All licenses expire on the last day of January following issuance or renewal. License holders renew by paying a renewal fee. Any license not renewed within 30 days is considered to have lapsed. The renewal fee for a lapsed license is the standard fee plus the fee for each lapsed period.

The board has the authority to award a license to an applicant previously licensed in another jurisdiction. This requires proof of licensed status and payment of a fee. The board may waive any or all other requirements at its discretion. The board also has the right to suspend or revoke any license for cause. Persons losing their license in this manner may appeal to the board. The board may also act on its own authority to investigate the practices of any license holder. Penalties for violating the provisions of this legislation may be steep:

“Sec. 20-310. Penalty. Any person who knowingly or willfully violates any provision of this chapter shall be fined not more than five hundred dollars or be imprisoned not more than three months or both.”19

19 Conn. State Code section 20-310
Licensed Professional Contractor

The information for this section was obtained from Joseph Drobka, owner and operator of Drobka Scenic who carries a General Contractor’s License. Additional information presented is from the Connecticut State Code.

Mr. Drobka states that he uses his license when his company does any new construction or significant renovation of an existing structure. He also uses his license whenever a job is supervised by an architect or mechanical engineer and requires stamped drawings. Also, any renovation work which, even if not considered significant, will substantively change the loading of the structure, requires a licensed general contractor.

Mr. Drobka states that his license helps his clients have confidence in his company, assures them of a given skill level and provides proof of insurance. He also says that a license indicates that a company has the financial means to finish a job.

These definitions are from section 20-341gg of the Connecticut State Code:

“Sec. 20-341gg-1. Definitions as used in these regulations...
...(b) ‘general contractor’ is any person engaged in the business of construction, structural repair, structural alteration, dismantling, or demolition of a structure or addition that exceeds the threshold limits in Section 29-276b of the General Statutes....

...Sec. 20-341gg-2. License Required
In order to safeguard life, health and property, no person shall engage in or offer to practice as a general contractor or a major subcontractor in the state, unless such person has secured a license provided in Section 20-341gg-3 hereof....”

This license is under the jurisdiction of the State Commissioner of Consumer Protection.

Contractors must apply for this license. The application must include the following information: a list of all current construction projects and all projects completed in the last five years, two credit references: one from the trade and one from a financial institution, a certificate demonstrating that appropriate liability insurance has been purchased, and a letter certifying that the company is currently in good standing in

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20 Conn. State Code section 20-341gg
the jurisdiction in which it operates, be that local, state, national or international. A $500 licensing fee must accompany the paperwork.

Licenses are awarded at the discretion of the Commissioner. If the Commissioner denies an application, the applicant may request a hearing. If the denial is upheld the applicant must wait one year before resubmitting.

All licenses expire on the first day of July after they were issued. Contractors may renew by paying a $500 fee. Applicants for renewal must also provide a certificate demonstrating appropriate liability insurance has been secured. Licenses not renewed within three years of expiration can be renewed only through re-application.
Licensed Electrician

The Connecticut State Code combines several trades into one category. The legislation governing electricians also governs plumbers, solar, heating, piping and cooling contractors and journeymen, elevator and fire protection sprinkler craftsmen and irrigation contractors and journeymen.

Section 20-330, subsection (2):

“(2) ‘Electrical work’ means the installation, erection, maintenance, alteration or repair of any wire, cable, conduit, busway, raceway, support, insulator, conductor, appliance, apparatus, fixture or equipment which generates, transmits or uses electrical energy for light, heat, power or other purpose, but on and after October 1, 1990, shall not include low voltage wiring, not exceeding twenty four volts, used within a lawn sprinkler system;”

Any person regularly performing electrical work as defined above must have a license.

The Electrician’s license is under the jurisdiction of the State Commissioner of Consumer Protection. The commissioner is advised by an independent board appointed by the governor. The board is made up of non-union contractors, union contractors, union journeymen, and public members. With the board’s advice, the Commissioner makes all the decisions regarding the regulation of electricians.

There are four levels of licenses: apprentice, journeyman, limited contractor (E-2), and unlimited contractor (E-1). Apprentice permits are issued for training purposes. Apprentices may only work under the direct supervision of a journeyman or contractor’s license holder. Journeyman licenses are for workers who have completed an approved training program and have accumulated at least four years of field experience. An unlimited contractor’s license can be issued to a person who has worked at the journeyman level for two years. To receive this license, a contractor must demonstrate to the board satisfactory evidence of competence in all aspects of their trade. The limited contractor's license is issued to persons meeting the unlimited requirement for a segment of their trade.

21 Conn. State Code section 20-330
A candidate for a license must apply to the board. The applicant must be at least 18 years old. The board may request any proof of competency at this time. The board will establish that the applicant is “of good moral character”. Applicants must provide proof that they have completed at least the eighth grade, or that they have the necessary education to complete the competency exam. Applicants must also pay an application fee, $50 for journeyman and $130 for contractors.

The National Testing Institute in Northboro, Massachusetts, an independent testing organization, administers the test. The contractor exam takes up to 4 hours. The test is multiple choice. The exam will cover the following areas: Grounding and Bonding, Services, Feeders and Branch Circuits, Raceways and Enclosures, Conductors, Motors and Controls, Utilization and General Use Equipment, Special Occupancies/Equipment, General Knowledge of the Electrical Trade and Calculations, Low Voltage Circuits Including Alarms and Communications, and Contractor Business and Law. The state provides a list of reference materials for exam preparation. Here are two sample questions:

“A run of EMT conduit may have ____ quarter bends.
(A) 1   (C) 3
(B) 2   (D) 4

If an electric kiln rated at 53 amps at 240 volts is operated on 208 volts, how much power is consumed?
(A) 1.7 kw   (C) 11.0 kw
(B) 9.6 kw   (D) 12.7 kw”

The answer to the first question is “D”; the second answer is “B”. A score of 70% is required to pass the exam. Applicants who fail the exam receive a report summarizing their strengths and weaknesses. They may retest twice within the next year. Applicants passing the exam receive a license and are listed as licensed to practice in the State of Connecticut. An additional fee of $75 is due at the time of licensing.

The Commissioner of Consumer Affairs may issue a license to a contractor licensed in another state. The applicant does not have to take the test, but does have to pay the appropriate fee. This process is handled on a case-by-case basis, at the discretion of the Commissioner.

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22 Conn. state electrical exam registration
The electrician's license expires after one year. No contractor may practice without a current license. License holders must apply for renewal, by sending a letter and $75 to the state board, who will renew licenses at their discretion. The receipt issued for a renewal payment serves as an interim license until a new license arrives. Any electrician allowing their license to lapse for more than a year must retest.
New York City Fireproofing Inspector

The New York City Fire Department runs one licensing program routinely used by several Broadway scene shops. This department administers two certificates: the Certificate of Fitness for Fire Guards and the Certificate of Fitness for Flame Proofing. The Fire Guards certification deals with work done in the theatre. The Flame Proofing certification deals with work done primarily in the shop.

Certificate of Fitness for Fire Guards

“Fire guards are required to reduce the threat of fires in a variety of locations. For example, they are required in places of public assembly, hotels, theaters, homeless shelters and marinas. Fire guards are used when a sprinkler system is not installed, e.g. at construction sites. Fire guards are also used when an automatic fire protection system is shut down while being repaired. The fire guards are responsible for making sure that fire safety regulations are being obeyed.

Fire guards must have a good working knowledge of basic fire fighting and fire protection techniques. They must know the location of all fire protection devices in their area of responsibility. They must make sure that these devices are in good working order at all times. The fire guard’s duties are outlined in greater detail in the following paragraphs...”

Fire guards are responsible for call boxes, warning signs, means of egress, fire extinguishers, and sprinkler systems. The fire guard is responsible for keeping records of extinguisher inspections, and visual inspections of sprinkler and standpipe systems. If there is a problem, a fire guard must report it to the fire department so they can adjust their fire-fighting strategy. A fire guard must also make sure only approved electrical devices are used.

In the event of an emergency, the fire guard is responsible for ensuring the safety of the building occupants. It is the responsibility of the fire guard to sound an alarm when smoke or fire is discovered. A fire guard must be prepared to take control and issue evacuation instructions.

23 From the NYFD studyguide
Fire guards are responsible for enforcing no smoking policies, making sure that signs are posted in the building. The fire guard makes sure adequate ash trays have been provided for smoking areas.

The Certificate of Fitness for Fire Guards is obtained by passing a test and paying a fee. Here are some sample test questions and answers from the study guide:

1. Fire guards are required at which of the following locations?
   (a) Construction Sites
   (b) Marinas
   (c) Places of public assembly
   (d) All of the alternatives are correct
   The correct answer is ‘d’. You would mark ‘d’ on your answer sheet.

2. The purpose of conducting fire drills is to:
   (a) give employees a break from work
   (b) practice emergency evacuation procedures
   (c) make sure the sparkler system works
   (d) be sure the Fire Department knows where the building is
   The correct answer is ‘b’. You would mark ‘b’ on your answer sheet.”

A score of 70% or above is passing. The fee is $25.00. The certificate is current for three years and renewable for $5.00.

Most theatres have a fire guard as part of their normal staff. A shop member holding this certificate could be designated as fire guard during load-in or technical rehearsals; times when the full theatre staff might not be present.

Certificate of Fitness for Flame Proofing

“... The New York Fire Department regulations apply to all public buildings including the following:
   Hotels (except guest rooms)
   Theatres
   Public Halls
   Department stores
   Buildings used for public assembly, amusement, or instruction.”

24 From the NYFD studyguide
The New York Fire Department regulations do not apply to the following:
Merchandise displayed for sale
Merchandise displayed at a business show
Offices
Works of art in museums
Materials used inside churches and places of religious worship.

The Certificate of Fitness holder is responsible for making sure that the materials used for artistic enhancement in the building meet Fire Department regulations. Fire Department inspectors may conduct unannounced inspections of the premises, and enforcement actions may be taken against the Certificate of Fitness holder when violations are discovered. Enforcement actions may result in fines against the owner and the revocation of the Certificate of Fitness. 25

The holders of this certificate are responsible for the flame proofing of all scenic materials. They must verify certificates of noncombustibility, field test or flame test all non-certified scenery, record all certificates and tests, and provide an affidavit detailing all fire proofing procedures.

In the case of pretreated or inherently flame proof materials, for example a prefabricated piece of soft goods constructed of flame proofed fabric, the certificate holder must obtain, record, and archive the manufacturers flameproofing certificates. If these certificates are not available, the certificate holder must test the scenic element. The certificate holder supervises or conducts the testing of all scenery. The two available tests are the field test and the flame test. A field test is done in the shop. A flame is applied to the sample for 12 seconds. To pass, the sample cannot ignite, burn at the contact point for more than 2 seconds, or break or drip off flaming pieces. In some cases, New York City fire inspectors may require a flame test. A flame test requires strictly controlled conditions. These tests are often conducted off site, at an independent laboratory. This allows inspectors to place greater faith in the results.

After gathering certificates and completing testing, the certificate holder must prepare an affidavit for each flame proofed scenic element. The certificate holder files these documents with the building owner and the Fire Commissioner. The affidavit must contain the following information:

25 From the NYFD studyguide
Professional Certification
& Theatrical Technical Production

✔ The date of the flameproofing treatment.
✔ The name of the flameproofing treatment used and its Board of Standards and Appeals approval number and/or its Fire Department Approval number.
✔ A statement asserting that the flameproofing procedures have been tested and they meet the standards established by the Board of Standards and Appeals and/or the Fire Department.
✔ The Certificate of Fitness holder’s name and his CoF number and its expiration date.
✔ The warranted period of the flameproofing effectiveness.  

The certificate holder is responsible for the accuracy of these documents.

Applicants obtain the Certificate of Fitness for Fire Proofing by passing a test and paying a fee. Here are two sample test questions and answers from the study guide:

“1. According to Fire Department regulations, who is responsible for making sure that all Fire Department regulations regarding flameproofing are obeyed in public buildings?
   a. The Certificate of Fitness holder and the owner of the building.
   b. The owner of the flameproofing facility.
   c. The Certificate of Fitness holder and the Education Supervisor.
   d. The manufacturer of the flameproofing chemicals.

   The correct answer is ‘a’. You would mark ‘a’ on your answer sheet.

2. Why are the materials used for the artistic enhancement of a public building flame proofed?
   a. To prevent ignition of the materials.
   b. To reduce the threat to life and property in case of fire.
   c. To prevent the spread of a fire if one occurs.
   d. All answers are correct.

   The correct answer is ‘d’. You would mark ‘d’ on your answer sheet.”

A minimum score of 70% is required to pass. The fee to take the test is $25.00. The certificate expires after three years and is renewable for a $5.00 fee.

A shop member holding this certificate would perform these duties during each project destined for a New York City venue. If the shop did not have a licensed person on staff, they would have to pay an independent certificate holder to do the work. In some cases, shops are hired to have their certificate holder bring a touring production’s scenery into flameproofing compliance for a New York stop.

26 From the NYFD studyguide
27 From the NYFD studyguide
Shops often pay the testing fees, but the individual holds the certificate, not the business.

According to the training guide, the only disciplinary action to be taken against a certificate holder is revocation. If a certified scenery piece fails a field test during a site inspection, the Fire Department may fine the building owner.
Another technician who is often required to hold a license is a pyrotechnician. This is one of the most heavily regulated vocations in the entertainment industry. Authorities at the local, state, and federal level all play a part in its regulation. A pyrotechnician must deal with the local Fire Marshal, the state Fire Marshal, the federal Department of Transportation (DOT), and the federal Bureau of Alcohol, Tobacco, and Firearms (BATF). These organizations collectively regulate the manufacture, sale, transportation, storage, and use of pyrotechnics.

To complicate matters further, each state and municipality has its own procedure for dealing with pyrotechnics. This section is a broad introduction to these regulations. It will deal only with the licenses, not with any of the other general rules.

Federal Licenses

As stated above, the federal bodies governing pyrotechnics are the Department of Transportation and the Bureau of Alcohol, Tobacco, and Firearms. The DOT’s jurisdiction covers the transportation of hazardous materials. To transport explosives overland legally, a driver must have a commercial driver’s license with a special hazardous materials endorsement.

The Bureau of Alcohol, Tobacco, and Firearms regulates the manufacture and sales of pyrotechnics. Nathan Kahn, a pyrotechnics dealer, said this in a summary of BATF rules:

“If you are in the business of using or dealing in theatrical pyrotechnic special effects, it is desirous for you to apply for and obtain a BATF license, even if you are not technically required to have one. The reason is that it will help you display competency to your local fire authorities...”

The BATF issues three licenses, one each for the User, Dealer, and Manufacturer. All of these licenses govern low explosives. Mr. Kahn’s summary lists nearly all pyrotechnic materials regularly used by theatres as either low explosives or as unregulated. Different rules and licenses govern high explosives.

28 “Theatrical Pyro Information” by Nathan Kahn at TheatreFX
There are no competency tests associated with these licenses. The main requirements are that the applicant be an adult U.S. citizen, and not be any of the following: a fugitive from justice, a user of unlawful drugs, mentally incompetent, or an ex-convict of a prison term exceeding one year. Along with those requirements, each of the licenses carries an annual fee.

The Users’ License: Explosives License Type #34 -- User of Low Explosives. This license permits the holder to buy and store low explosives. The annual fee for this license is $20.

The Dealers’ License: Explosives License Type #27 -- Dealer of Low Explosives. This license permits the holder to sell low explosives. The annual fee for this license is also $20. The Type #27 license also covers use and storage, so holder’s of this license do not need a Type #34.

The Manufacturers’ License: Explosives License #19 -- Manufacturer of Binary Explosives. Technicians who regularly mix two part flash powder in the course of their job may be required to hold this license. The annual fee for this license is $50. Some technicians are not necessarily be required to have this license. BATF rules state:

“A person who regularly and continually combines compounds of binary materials to manufacture an explosive is engaged in the business of manufacturing explosives and shall be required to be licensed as a manufacturer.”

This means that a Master Electrician setting up pyrotechnic effects for one show probably does not need to obtain this license. However, a production electrician filling the same role on an extended tour does need the license. The Type #19 license also covers sales, use, and storage. A holder of a type #19 license does not need a Type #27 or Type #34 license.

Information on these licenses is available from the Bureau of Alcohol, Tobacco, and Firearms. Other good information sources include the local Fire Marshal and pyrotechnics dealers.

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29 BATF ruling 75-31
State Licenses

A brief survey of theatre technicians yielded a wide and uneven description of state pyrotechnic licenses and practices. One of the more interesting programs described was a Pennsylvania license. Under the terms of this program, only persons displaying fireworks for profit need a license. Many respondents’ states do not have licensing laws, and all decisions are strictly under the jurisdiction of the local Fire Marshal. In all cases, in jurisdictions with licenses or without, the ultimate approval always rests with the local Fire Marshal.

Randy Beckham, a pyrotechnics equipment dealer in the Southwest, stated that California, Nevada, and Texas all have state licenses. Receiving any of these licenses requires passing a test. He also said that the City of Phoenix has its own test in addition to the state license.

To simplify this complex topic, the rest of this section considers the procedures and requirements in the State of Connecticut. The Connecticut fireworks licenses are administered through the Department of Public Safety, Division of Fire and Building Safety, Bureau of State Fire Marshal.

The state issues three licenses in the form of certificates of competence. The first is for pyrotechnic operators and assistants. This license permits the holder to be the operator or assistant for outdoor fireworks displays. This license would be inappropriate for a theatre technician. The scope of activities governed by this license exceeds the normal needs of the theatre. The second license is the “Special Effects Certificate”. This license permits the holder to set up and operate indoor pyrotechnic special effects displays. There is also a related certificate titled “Special effects certificate -- limited”. The State Administrative Regulations describe these certificates:

“Sec. 29-357-12a. Operator to have certificate of competency
Every display of special effects shall be handled by a competent operator, certified as such by the state fire marshal. Such operator shall have his certificate of competency in his possession when engaged in conducting a special effects display, and shall exhibit the same upon the request of any authorized person or official.

Sec. 29-357-12a.1. Classes of certificates of competency
(a) Special effects certificate. This certificate is restricted to the use, preparation for transportation, and the preparation and use of all
types of special effects pyrotechnics, for the sole purpose of producing a visible or audible effect where and when such use is a necessity of a motion picture, television, theatrical, operatic, educational, recreational or entertainment production, as may be permitted by the state fire marshal.

(b) Special effects certificate - limited. This certificate is limited to the use of one or more special effects, which effects are to be repetitiously used as may be permitted by the state fire marshal under a limited special effects permit.”

To be licensed for any fireworks license in Connecticut, applicants must fill out an application, take a test, and pay a fee. Sample test questions were not provided by the Department of Public Safety. The application contains questions concerned with contact information, professional history, and criminal record. Of particular note is a question asking if the applicant had ever caused an injury or property damage as the operator of a pyrotechnic display. The Department of Safety lists applicant requirements as follows:

a. Applicant must have a minimum of three (3) years of experience in the applicable field.

b. Applicants must have a letter from their local Chief of Police, attesting that the applicant is of good character suitable to handle explosives, fireworks, or special effects.

c. On a separate sheet of paper furnish the Names, Addresses and Telephone numbers of two (2) Personal References whom have been known a minimum of five (5) years.

d. Applications for the use of Fireworks/Special Effects must be presented by the applicant to the Department of Public Safety at 1111 Country Club Road, Middletown, CT 06457-9294 thirty days prior to examination.

e. Two passport type photographs (1-1/2” x 1-1/2”), taken within the last year must be submitted.

f. Print or type all responses on the application.

g. A fifty dollar ($50.00) check made payable to the Treasurer, State of Connecticut must accompany any application for Fireworks/Special Effects type license.

h. A written examination will be given to all applicants at a date and time to be determined.

i. Applicants are required to be fingerprinted here upon satisfactory completion of the written exam, at an additional fee of five dollars ($5.00)

j. All applications must be accompanied by three (3) letters attesting to your competence in handling Fireworks/Special Effects. Each letter must contain the Name, Title, Complete address, and Certificate of

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30 Conn. State Code section 29-357
Competency Number and State in which issued, and signature of the individual. At least one of the three letters must be from an individual holding a Connecticut Certificate of Competency.

k. Two positive forms of identification, i.e., photo drivers license, social security card, birth certificate, or work photo ID.\(^{31}\)

The above list states that applicants for this certificate must already have three years experience working in the employ of a Licensed Pyrotechnics Operator. It is also noteworthy that there is no mention of any federal license in the above list. The only federal agency mentioned in the regulations is the Department of Transportation regarding shipping and storage of pyrotechnics.

Finally, there is one more interesting provision of the state regulations:

“Sec-29-357-13a.1. Fire marshal to be present
The applicant to whom the permit has been issued shall arrange for the detailing of one member of the local fire marshal’s office or such larger number as may be deemed necessary by the fire marshal. The expenses for such marshal shall be paid by the applicant.”

There is a similar provision for police supervision if deemed necessary. This would suggest that, licensed operator or not, Connecticut law gives the final approval to the local Fire Marshal.

\(^{31}\) Conn. state fireworks/special effects application
Certification

The certification programs that follow are currently available in the United States. Each of these programs either has or could have a place within the theatre industry.

American Welding Society Certification

Steel scenery has become the norm rather than the exception at many levels of theatre production. Theatre technicians routinely serve as welders. These technicians are often asked to create critical welds on structural, mechanical, and rigging projects. Most theatrical welders have little or no professional instruction, having learned their craft while rising through the ranks. While this may be accepted practice in the theatre, it is not acceptable in many other industries.

The American Welding Society (AWS) is a professional organization dedicated to promoting welding skills in industry. This group holds conferences and workshops, and publishes a newsletter. The AWS has also worked with ANSI (American National Standards Institute) to develop and publish procedural specifications for many specific welding applications. Along with these activities the AWS also administers a certification program.

"The American Welding Society (AWS) Certified Welder Program is established to identify all elements necessary to implement a National Registry of Certified Welders. Four key elements are identified:

1. Welder performance qualification standards.
3. Accredited performance test facilities.
4. AWS welder certification requirements.

This Standard contains the criteria for AWS Certified Welder Program and the AWS National Registry of Welders. Public listing or disclosure is at the option of the individual welder. It is expected that all four elements outlined above will allow the transfer of welder qualification from employer to employer. This potential transfer of welder qualification can effect financial savings to the welding industry.

The Purpose of this Standard for AWS Certified Welders is:

1. to determine the ability of welders to deposit sound welds in accordance with standardized requirements."
(2) to impose sufficient controls on the documentation and maintenance of certification to allow transfer between employers without requalification, where allowed by Standard or Contract Documents.”

The AWS administers three basic certification programs: AWS Certified Welder, Certified Welding Inspector (CWI), and Certified Welding Educator (CWE). These programs have a wide acceptance into industry. Industry standards or contract documents may require the use of certified welders on many projects. Several theatrical shops already use certified welders and welding inspectors.

Certified Welder

Welders are certified for particular types of welds, positions, metals, and shapes. Selected specific certification programs include Structural, Sheet Metal, and Pipe & Petroleum.

The certification process has three parts. The first part is a form that asks some personal information, which certification is sought, if the applicant has a prior certification, and educational background. Applicants must also include a current photo ID, and an application fee.

The second part of the application process is a vision test. Applicants must have near-vision acuity and far vision acuity of 20/40 or better, with or without corrective lenses. AWS provides a medical record form for an approved examiner.

The final procedure is a welding qualification test. This is a practical exam. The exact content of the exam is determined by the particular area of specification being certified. The following test description is for a limited structural welder certification:

**PERFORMANCE TEST DESCRIPTION**
Test Number: D1-SM-F4-P-A-L

<table>
<thead>
<tr>
<th><strong>Welding Process:</strong></th>
<th>Shielded Metal Arc Welding (SMAW)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Material:</strong></td>
<td>ANSI/ATSM A-36, 3/8” thickness (rolling direction perpendicular to the beveled edge)</td>
</tr>
<tr>
<td><strong>Material Form:</strong></td>
<td>Plate</td>
</tr>
<tr>
<td><strong>Filler Metal:</strong></td>
<td>ANSI/AWS a5.1, Class E-7018 (Group: F4)</td>
</tr>
<tr>
<td><strong>Weld Joint Detail:</strong></td>
<td>ANSI/AWS D1.1, Para. 5. 19</td>
</tr>
<tr>
<td><strong>Backing:</strong></td>
<td>Prequalified steel plate from ANSI/AWS D1.1</td>
</tr>
</tbody>
</table>

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32 AWS QC 3-89 Standard for AWS Certified Welders
Professional Certification
&Theatrical Technical Production

Welding Position: 3G & 4G (See ANSI/AWS A3.0-89 Figure 14)
Weld Progression (Vert): up
WPS No.: 1-QC-W2
Test Required: Visual plus one root bend and face bend. Radiography may be used in lieu of bend tests.

LIMITS OF WELDER QUALIFICATION

Code: ANSI/AWS D1.1
Weld Process: SMAW
Base Material: Prequalified steels from ANSI/AWS D1.1
Filler Metal: Group F4 and lower
Thickness: Groove: 1/8” thru 3/4”
Fillet Weld Size: All
Positions: All
Weld Progression: Vertical, up
Backing: Required for full penetration, single groove welds
Pipe/tubing Dia.: Over 24”
Material Form: Plate, pipe, shapes, strip, tubing as listed in ANSI/AWS D1.1

The test has eight components. First, applicants receive a number coded to their social security number. The test supervisor then checks the applicant's photo ID against the photo submitted with the application. Applicants must provide their own equipment and also follow any safety rules of the testing facility. If an applicant’s vision test indicates the need for corrective lenses, then the applicant will use them for the qualification test. Next is a Material Check, in which the test supervisor checks the base materials at the time of tack welding. The applicant then positions the assembly under the direction of the supervisor. Components seven and eight specify that the supervisor will be sure the assembly is in the correct position and that it remains there through the entire welding process.

An applicant who fails a test may request an immediate retest. Retests consist of two welds of each type the applicant failed. Applicants may also request a delayed retest. In a delayed retest an applicant receives only one chance for each weld they

33 AWS QC 3-89 Standard for AWS Certified Welders
failed. Delayed retests must take place within 30 days of the original test. After 30 days, the entire test must be repeated.

A welder is certified after successfully passing the qualifying test. AWS Welder Certification is effective for one year. Welders have two procedures for recertification. They can test again; or they can have an employer submit a record of employment showing regular work in the specific area of certification.

AWS reserves the right to revoke any welder’s certification for cause.

Certified Weld Inspector

“The objective of the Welding Inspector Qualification and Certification Program is to determine the knowledge of welding inspectors who may be required to inspect weldments or welded products, in accordance with codes or other specified requirements.

The examination of applicants for a broadly based welding inspector qualification/certification program must include requirements of various codes, standards, specifications, base materials, filler metals, heat treatments, mechanical properties, welding processes and procedures, inspection methods, acceptance standards, tests, welding qualification requirements, fabrication tolerances, and other aspects of fabrication and assembly with which the welding inspector may be involved. Therefore, the Qualification and Certification Committee has formulated examinations which include important aspects of these elements of fabrication operations which will evaluate the applicant’s knowledge in these areas. The examination also includes the use of micrometers, calipers, and weld gauges on test specimens. The use of the inspection tools is required to complete part of the examination.”

The AWS administers two inspector certification programs: CWI - Certified Welding Instructor, and CAWI - Certified Associate Welding Inspector. The duties applicable to each of these certificates are very much the same. The difference is that CAWI holders must work under the supervision of a CWI. A CWI needs to be capable of verifying that base metals, filler metals, welding equipment, and welding procedures are appropriate for the particular task. An inspector must be able to read and interpret welding drawings. Also, a CWI must be able to verify the qualification of certified welders. The CWI is required to recommend recertification for welders not up to

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34 Guide to AWS Welding Inspector Qualification and Certification
current requirements. Finally, inspectors must verify the quality and appropriateness of welds and welding procedures.

The certifying process for inspectors includes an application, a vision test, experience verification, and three competency exams. The application includes personal information, work experience, and educational background. Applicants must have at least five years of related professional experience. There is a complicated method for substituting education for experience credit.

CWI applicants must meet the same vision standards as AWS Certified Welders. The AWS provides the appropriate form.

The Certified Welding Inspector certification process has three written tests. The first test is the Code/Standard test. This is an open book test whose purpose is to verify the applicant’s ability to interpret welding specifications. A sample question from the Code/Standard Test:

“An established welding procedure must be reestablished if there is a change in filler metal from
(A) E6010 to E6011
(B) E6010 to E7010
(C) E7010 to E7016
(D) all of the above
(E) none of the above”35

The answer to this question is “C”. The next test is the Fundamentals test. The purpose of this test is to measure the applicant's knowledge of basic principles, terminology, materials, and procedures that affect weld quality. An example from the Fundamentals test:

“Stress risers in a weld are caused by
(A) low impact strength of the weld metal
(B) low yield strength of the heat-affected zone
(C) undercuts, incomplete penetration
(D) a smooth butt joint
(E) all of the above”36

The answer to this question is “C”. The final test is the Practical Application test. The purpose of this test is to measure the applicant’s ability to interpret test results, symbols,

35 AWS QC-1-88 Standard for AWS Certification of Welding Inspectors
36 AWS QC-1-88 Standard for AWS Certification of Welding Inspectors
drawings and procedures. It also checks the applicant’s ability to accept or reject test specimens. This test has a written portion and a practical portion. A sample question from the written portion:

“The person required to sign the bottom line of the welder qualification form is:
(A) the independent test lab owner
(B) the Certified Welding Inspector
(C) a representative of the company that employs the welder
(D) the insurance company inspector
(E) the welder who is being qualified”37

The answer to the above question is “C”. The hands-on portion of the exam includes questions about provided test objects. These questions involve terminology and measurement. Applicants must pass all three exams to become certified. Any applicant not achieving CWI scores but meeting CAWI minimums may receive a CAWI certification. Furthermore CAWI applicants achieving CWI test scores may request an upgrade to CWI, provided their other qualifications also meet CWI requirements.

CWI certificates last three years. After that period inspectors must provide evidence of continued employment as an inspector, or retest.

The AWS has a code of ethics for its Certified Welding Inspectors:

“8. Code of Ethics

Preamble: In order to safeguard the public’s health and well-being and to maintain integrity and high standards of skills, practice and conduct in the occupation of welding inspection, the American Welding Society CWI and CAWI shall be cognizant of the following principles and the scope to which they apply with the understanding that any unauthorized practice is subject to the Committee’s review and may result in suspension, reprimand or revocation of certification.

8.1 Integrity. The CWI and CAWI shall act with complete integrity in professional matters and to be forthright and candid to the Committee or its representatives on matters pertaining to this standard.

8.2 Responsibility to the Public. The CWI and CAWI shall act to preserve the health and well-being of the public by performing the duties required of welding inspection in a conscientious and impartial manner to the full extent of the inspector(s) moral and civic responsibility and qualification. Accordingly, the CWI and CAWI shall:

37 AWS QC-1-88 Standard for AWS Certification of Welding Inspectors
8.2.1 Undertake and perform assignments only when qualified by training, experience, and capability.

8.2.2 Present credentials upon request.

8.2.3 Neither falsely represent current status nor seek to misrepresent certification level (CWI/CAWI) by modification of certification documents or false verbal or written testimony of current level or status.

8.2.4 Be completely objective, thorough, and factual in any written report, statement or testimony of the work and include all relevant or pertinent testimony in such communiqués or testimonials.

8.2.5 Sign only for work that the inspector has inspected, or for work over which the inspector has personal knowledge through direct supervision.

8.2.6 Neither associate with nor knowingly participate in a fraudulent or dishonest venture.”

The code of ethics continues with rules regarding public statements (8.3). Inspectors must keep details of inspections private. Another section addresses possible conflicts of interest (8.4). This section lays out rules regarding whom the inspector can work for, the practice of soliciting or accepting gratuities (not allowed), and inspections of government projects by government employees. The next section defines ways in which inspectors may solicit work (8.5). The final section of the code of ethics defines unauthorized practice (8.6). Any part of an inspector's job that is in conflict with any portion of the entire AWS Inspector Standard constitutes an unauthorized practice. The AWS retains the right to revoke any CWI or CAWI certification for cause.

38 AWS QC-1-88 Standard for AWS Certification of Welding Inspectors
Certified Welding Educator

The AWS also administers a certification for welding instructors: CWE - Certified Welding Educator. This certification is for teachers who instruct welding students.

The qualifications and procedures for this certification are the same as for the CAWI certification discussed above with one additional requirement. Applicants must also pass an AWS Certified Welder test in the area of qualification they will be teaching.

CWE certification lasts four years. Educators may recertify by providing evidence of continued employment in their certified specialty.
American Institute of Motion Engineers (AIME) Certification

“AIME’s Task
Based upon continuous input from motion control users, AIME’s task is to:
✓ Provide educational and support systems
✓ Facilitate selection of motion solutions
✓ Identify and encourage an Industry Focus on strategic technology development
✓ Promote standardization of advanced technology solution”39

Motion control is one of the fastest growing technologies in the theatre industry. Artistic personnel at more and more levels of the industry are producing designs requiring technical solutions including advanced motion control solutions. There are only a handful of qualified motion control systems designers and technicians working in theatre. The AIME is dedicated to the support and development of motion control personnel in all industries. The AIME administers two certification programs: the Certified Motion Control Specialist: Systems Design, and the Certified Motion Control Specialist: Systems Applications. AIME membership is not a requirement for certification.

The CMCS: Systems Design certification program is for product designers and control systems engineers. Holders of this certificate need to understand various motion control technologies at an advanced level and to be proficient at using mathematical modeling techniques to predict system performance. A CMCS:SD must have a thorough engineering knowledge of all components of a motion control system. Persons holding this certificate will typically design new and unique control systems.

The CMCS: Systems Applications certification is for application engineers, technical sales professionals, and project managers. Holders of this certificate must be familiar with and understand a wide range of commercially available motion control equipment. This knowledge may be at a basic level. CMCS:SA holders should rely on personal engineering judgment and real world experience. These technicians will normally be responsible for the defining of system requirements and selection of commercially available components. They also install and maintain these systems.

39 AIME brochure
Applicants for either of the certificates must complete a three-step assessment process. First is an evaluation of experience. Candidates with no formal education must have eight years of professional experience. With a minimum of two years formal education in a related field, the experience requirement is four years. Applicants must also submit two letters of recommendation attesting to their performance in the field of motion control.

The second step in the certification process is an exam: the Fundamentals Examination. This is a three-hour multiple choice test, offered twice a year. Questions on this test come from any or all of the following areas: controls, mathematics, electricity, mechatronics, motion control principles of analysis and design, executive functions, and architecture. AIME offers seminars on these topics at their annual conference and recommends that applicants attend to brush up on their skills. They also publish a study guide for the exam.

The third and last step is a proficiency examination. The test consists of sixteen open-ended essay questions. The applicant must choose six questions to answer. This way they may select the questions most appropriate to their expertise. The questions are application oriented and based on case studies. An applicant passing each step of this process becomes certified.

The above process has several fees. A $25 fee is due with the experience credential submission. The Fundamentals Examination costs $50. Re-tests, within one year, cost $10. The Proficiency Examination costs $25. This test must be proctored at a local educational institution. Any cost incurred for this proctoring are the responsibility of the applicant. PE re-tests also cost $10.

AIME certificates are renewable every three years, at a cost of $30. A test is not required to re-certify, but applicants must provide proof of continued education and experience. Applicants for re-certification must earn 12 continuing education points. Applicants earn one point for each hour of attendance at activities such as college courses, seminars, workshops, technical training programs, and AIME sponsored events.
Fluid Power Society (FPS) Certification

“...The Fluid Power Society (FPS) is a non-profit organization chartered in 1960 to further the growing technology of fluid power (hydraulics and pneumatics); to foster activities aiding its development and application; to meet the needs of those working in this technology; and to exchange information, ideas and techniques....

... The Fluid Power Society has established a certification program to distinguish those who have reached an established level and scope of knowledge in the field of fluid power. Leaders in the fluid power industry want those working in fluid power to have the same degree of credibility and professionalism as found in industries where certification programs already exist....”

Implementation of hydraulic solutions has been problematic in the theatre industry. A history of equipment failures and workplace messes have given hydraulics a bad reputation. Many technical managers have become convinced that this type of solution is too difficult, expensive, or in other ways beyond the ability of their shops. In spite of this reputation, hydraulic solutions remain some of the most appropriate technical design choices in our industry.

The Fluid Power Society has developed a certification program to ensure a given level of competence and professionalism among fluid power professionals. The organization currently offers eight certificates:

- Fluid Power Industrial Hydraulic Mechanic
- Fluid Power Pneumatic Mechanic
- Fluid Power Mobile Hydraulic Mechanic
- Fluid Power Hydraulic Technician
- Fluid Power Pneumatic Technician
- Fluid Power Specialist
- Fluid Power Electronics
- Fluid Power Engineer

FPS literature states three goals for the certification program:

1. To challenge and strengthen an individual’s knowledge of fluid power.
2. To recognize individuals who have demonstrated a thorough understanding of fluid power principles.

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40 FPS Fluid Power Specialist Certification guidebook
41 FPS Fluid Power Specialist Certification guidebook
3. *To understand the professional standing of those working in fluid power.*

The Fluid Power Society lists three major reasons for professionals to pursue certification. The first is that a certification is an excellent credential, which will help job seekers set themselves apart from others. The second is that earning a certification will provide evidence of a worker’s value to their employer; this could result in better work assignments or even promotions. The last listed reason is that certification demonstrates to employers and other professionals a worker’s efforts to achieve and maintain the highest possible professional proficiency.

**Fluid Power Mechanic**

The Fluid Power Mechanic certification is intended for those workers assembling and maintaining fluid power systems. The certification process starts with an application and a fee. The fee for the Mechanic Certification is $95 for FPS members, $130 for non-members, and $45 for full-time students. After receiving the application, the FPS sends out a review manual and pre-test. Applicants are encouraged to attend an FPS accredited review session before testing.

The Mechanic certification test consists of a written test and a job performance test. The FPS literature contains some sample questions from the written test:

“2. What would cause a *petroleum base* fluid to turn a milky color?
   a. Foaming
   b. Aeration
   c. Agitation
   d. Oxidation
   e. Moisture”

In this case the answer is “e”. Candidates must score 70% or better to pass the written test. This is the description of the job performance test:

“During the job performance portion you’ll be required to complete six work job performance tests in three hours. Typical tasks include identification of fittings, fasteners and fluid power symbols, bending and

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42 FPS Fluid Power Specialist Certification guidebook

43 FPS Fluid Power Mechanic Certification guidebook
flaring tubing, making hose connections, setting pressure relief and pressure reducing valves, and drawing fluid power circuits."\textsuperscript{44}

A passing score on the performance test is an average of 70 out of 100 points for each of six tasks. No single task score may be below 60 points.

Those applicants passing the test receive certification, which is valid for five years. Those who fail may re-take the tests for a discounted fee. After five years a mechanic must re-apply. There is no re-test requirement if a candidate can demonstrate satisfactory job experience.

**Fluid Power Technician & Fluid Power Specialist**

The Fluid Power Technician Certification is designed for those workers who are responsible for writing technical reports and preparing graphs and schematics describing the operation and performance of fluid power systems. The Specialist certification program is intended for those involved in systems design, selection and application of fluid power products, and supervision of systems design and installation.

The certification process is analogous to the mechanic certification. The fees are higher: $110 for members, $160 for non-members, and $45 for students. Both certification programs have a written test. From the hydraulic technician exam:

\textit{“2. Which load holding valve is used to lock a cylinder in place so it will hold position without drift?”}
\begin{itemize}
  \item a. Brake
  \item b. Sequence
  \item c. Unloading
  \item d. Pilot check
  \item e. counterbalance”}\textsuperscript{45}
\end{itemize}

The answer given for that question is “d”.

\textsuperscript{44} FPS Fluid Power Mechanic Certification guidebook

\textsuperscript{45} FPS Fluid Power Technician Certification guidebook
From the specialist exam:

“6. How much oil will a pump, which can deliver 5 GPM at 1200 RPM, deliver in 5 seconds when operated at 1800 RPM?
   a. 144.4 cu. in.
   b. 2.5 gal.
   c. .625 cu. in.
   d. 96.25 cu. in.
   e. .125 cu. in.”

The answer given for that question is “a”. These programs do not have a job performance test. 70% is a passing score for both tests.

These two programs also require re-certification every five years.

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46 FPS Fluid Power Specialist Certification guidebook
Vendor & Factory Certification

To better educate the work force, several vendors and manufacturers offer certification programs. In most cases these programs exist to create a group of trained technicians as part of a wider marketing plan, based on the logic that if trained people are available in the field, then the demand for a specific product will grow. Also, a body of trained technicians helps to solidify a product’s position in the market. In some cases the motivation may also have a safety component.

A brief exploration of the market revealed four certification programs of this type related to theatre. Vari-Lite maintains a program to certify operators of their lighting systems. Softdesk, a software company that produces CAD programs, administers two certificates. At their annual convention, applicants take seminars and exams for either an architectural or a mechanical CAD certification. Columbus McKinnon Corporation (CM) administers a training program supporting their chain motors. Finally, Meyer Sound runs a school and a certification supporting their SIMM machine. This section takes a closer look at these last two programs.

Jim Krull of CM provided this information about their Motor School. CM runs a program to train anyone interested in the maintenance and operation of their chain motors. The participants in Motor School come from many commercial industries as well as the entertainment field. He asserts the program exists to make industry safer. Mr. Krull acknowledges that technicians may leave the program calling themselves “certified chain motor technicians.” However, he states that while CM does not actively discourage this practice, that it is not the intent of the program. The course does not conclude in an exam. Participants receive a certificate of participation, not of competence. The program content is courses detailing maintenance and repair procedures for the chain motors.

Technicians attend the Motor School for many reasons. Some participants really want to expand their knowledge about the machines. Others are participating in the training course to build their professional qualifications for promotions. Many of the participants attend the school so that their employers may designate them as staff motor technicians. OSHA recommends this designation procedure. These programs normally
occur at a central location and are open to everyone. For a fee, CM will conduct an on site motor school for a company’s staff.

The SIMM analyzer is a product marketed by Meyer Sound. Meyer runs a program called SIMM school, which includes a training program and two certificates: Certified SIMM Operator and Certified SIMM Engineer. Jamie Anderson of Meyer Sound says that the certification program exists simply to boost sales of the device to entertainment companies. The school teaches technicians how to operate the device correctly, not how to interpret the results. The average attendee is already highly skilled in this field.

The process begins with a pre-qualifying test. Anyone may register and attend the SIMM school, but only those who pass the pre-qualifying test can obtain certification. Many designers who would not normally be operating the device in the field attend anyway, without going for certification. The school program contains three days of classroom work and one day of field work. After the classes there is a three-hour exam. Those students passing the exam receive certification. The certificate at this level is Certified SIMM Operator.

After one year of professional experience in the field, Certified SIMM Operators may petition to move up to Certified SIMM Engineer. This process consists of providing evidence of professional experience and interviewing with the Meyer Sound staff. Meyer functions as a referral service for certified technicians. The difference between the two certificates is the level of work Meyer will refer. Smaller projects generally receive names of certified operators. A Broadway technical supervisor looking for a SIMM operator would probably receive the name of a certified engineer.

There is a fee for the course. About half the students pay for themselves and half have the course fee paid by employers. Half of those students paying their own way (25% of the total) are the owners of one-person companies.

Meyer had to broaden the SIMM School curriculum to continue to attract students. The content of the classes expanded to cover more general sound design and engineering topics. Meyer did this even though the operation of the SIMM analyzer is a very specific process. It is Mr. Anderson’s opinion that the program would not survive if the sole course content was SIMM operation.
Site Rigging Certification Programs

Many theatre professionals are familiar with Jay O. Glerum’s “Professional Rigging Workshops.” These workshops feature a three-day program of rigging classes. At the end of the workshop, attendees receive a certificate of attendance. Mr. Glerum does not intend for participants to walk away from one of these workshops calling themselves a certified rigger. Asked to explain why his program does not offer a certification, Mr. Glerum presented some problems. The first problem is that there is no test, and therefore no assessment of the participants’ comprehension of course materials. Mr. Glerum believes that the time a test would take is better spent offering more classes. A second problem is the composition of the group of attendees. To reach the widest population, the Professional Rigging Workshops are in no way grouped by skill level. People with no experience attend the same classes as people who might be rigging experts. Since the skill levels vary, there is no way of knowing in advance what specific materials each workshop will cover. The diversity of participants also means that the conditions described in the workshop may not be the same as the working conditions of each of the participants. Any certification based on the workshop might then prove useless to any given participant.

Still, Mr. Glerum recognizes that there is a desire within the theatrical rigging community for a rigging certification. His compromise solution is the site rigging certification. This process involves a representative’s visiting a specific facility. The certifier inventories the facility’s house rigging equipment and assesses the normal level of rigging done by the company. The representative then evaluates the staff skill level, and meets with management to determine the specific needs of the company and the facility. The result of this research is a custom rigging certification. This is a tailored certification, specifically designed to meet the needs of a given company, staff, facility, and scope of production. Building on this template, a training program and an assessment exam are developed. The company can then use this program to certify its people.

This type of certification program does not benefit the whole industry. Some theatres, with stable labor pools, may be able to use this type of solution to verify the competence of their employees. In those cases this would probably be a useful tool.
Foreign Programs

Technical theatre professionals in the United States are not alone in their wrestling with the concept of certification. Many other countries have various forms of licensing or certification for technical theatre professionals. This section will present known certifications or licenses for technical theatre personnel that are currently in use abroad.

Little or no information on this subject is obtainable through traditional avenues of research. Much of the data published on this topic is not readily available in this country. Since a whirlwind, world fact-finding tour was not within the scope of this investigation, international sources of information were identified without leaving home. An initial request for information went to each of the OISTAT chapters in the United States Institute of Theatre Technology (USITT) member directory. The response rate to these letters was not substantive, and no certification or licensing programs were discovered through this initiative.

Most of the information for this section came from the Internet. Messages requesting information on existing theatrical technical licenses or certifications in countries outside the United States were posted on the following usegroups: alt.stagecraft, rec.arts.theatre, rec.arts.theatre.plays, rec.arts.theatre.musicals, and rec.arts.theatre.stagecraft. Follow ups to these responses yielded further information made available by e-mail, fax, or regular mail. This research would not have been possible without the contribution of Internet users abroad.

The investigation revealed three verifiable programs. They are: an entertainment electricians’ license in Canada, a technicians’ licensing program in Germany, and a technicians’ certification program in Britain.
Canadian Entertainment Electricians’ License

Overview

This program consists of a license issued by the Government of British Columbia. The Electrical Safety Branch of the Ministry of Municipal Affairs administers the program. The licenses are designated FE and LE for Full Entertainment and Limited Entertainment respectively.

From the Electrical Qualification Certificate Examination Information Kit:

“GROUP 9

a) FE Full Entertainment
- Restricted to the temporary installation and maintenance of feeders, branch circuits and equipment used for the production of trade shows, exhibits, displays, festivals, conventions, stage, theatre, carnivals, traveling shows, movie and television locations and film, or video productions. Maximum of 400 amps, 750 volts, 3 phase power. Permanent wiring of electrical distribution centres or installation, maintenance or repair of service conductors, and service equipment is not authorized under this certificate except for equipment required for power connection.
- Minimum of four (4) years relevant training and experience in the entertainment industry directly in the activity for which this certificate is intended including electrical work on three phase systems.
- Area of Examination: Items 7.1 to 7.6 inclusive and 7.10, B.C. Electrical Code sections: 0, 2, 4, 8, 10, 12, 14, 16, 26, 28, 30, 34, 42, 44, 48, 66, 76.
- Time allowed to write is 3.5 Hr.

The FE holder covers a wide variety of work in the entertainment industry. The FE may be responsible for the utility/generator connection and all feeders and branch circuits associated with any entertainment event. For example, an FE holder may be a contractor who sets up and maintains all wiring associated with a movie set, a carnival, a trade show, a sports event, etc.

b) LE Limited Entertainment
- Limited to assembly and interconnections of plug-in wiring systems employed in trade shows, exhibits, displays, festivals, conventions, stage, theatre, carnivals, traveling shows, movie and television locations, and film or video productions. Maximum of 240 volts, 100 amps, three phase power, utility supplied. Maximum of 240 volts, 200 amps, three phase power, generator supplied. (A generator cannot sustain a fault to the extent that a utility can.)
- Minimum of two (2) years relevant training and experience in the entertainment industry directly in the activity which this certificate is intended including electrical work on three phase systems. Time served in theatre technology course may be considered towards the experience requirements.

- Area of Examination: Items 7.1 to 7.6 inclusive and 7.10, B.C. Electrical Code sections: 0, 2, 4, 8, 10, 12, 14, 16, 26, 28, 30, 34, 42, 44, 48, 66, 76.

- Time allowed to write is 2.0 Hr.

The LE certificate covers a wide spectrum of work in the entertainment industry. For example, an LE holder may be an instructor in an academic environment where theatre technology is taught or a volunteer worker who sets up equipment for a play at a local church. An LE holder could be a person who strings cables and sets up lighting on stage or a movie location or connect together cables at a trade show or carnival. The range of tasks may vary widely, but the safety aspects are universal to all persons regardless of the level they work at.”  

As shown above, the requirements for these licenses include an examination, proof of training, and proof of experience. These licenses are awarded in the same manner as other “groups” including Municipal Electrical Inspector, Elevator Mechanic, and Medical systems technician, Dental diagnostic imaging equipment technician, among others.

The evolution of this program is especially interesting. The initial push to begin this program originated with members of the public who perceived a deficiency in electrical practices at carnivals. This led to a taskforce that worked with the Electrical Safety Branch (ESB) to develop a license. Eventually, the ESB sent an information package to technicians they had identified as being affected by the rules change. At that time there was a groundswell of concern among theatre technicians. The scope of the original legislation was much wider than these workers had anticipated. The original wording would have prohibited any unlicensed individual from plugging in a lamp, headset, or microphone at an entertainment event. The industry and the Electrical Safety Branch then went through a period of negotiation. During this time the language was refined to more accurately address the perceived problem while not bringing all work to a stop.

47 “BC Electrical Certification Update”, StageWorks magazine, October 1994
The final version permits unlicensed personnel to do most of the normal jobs required of theatrical electricians. The bulk of these jobs are “plug-in” tasks. Unlicensed technicians are prohibited from undertaking any task that requires wiring. The following are examples of jobs that fall within LE jurisdiction:

1/ Repair lighting instrument and cables, replacing pigtails, lamp sockets, plugs and connectors.
2/ Repair audio cables and connectors as required.
3/ Assemble new electrical extension cables.
4/ Assemble new microphone and speaker cables.
5/ Adjust and replace plug-in dimmer modules and control trays in dimmer racks, eg CD-80 and ENR systems.”

48 “BC Electrical Certification Update”, StageWorks magazine, October 1994

The following are jobs that fall into the FE jurisdiction:

1/ Install electrical wiring on or into set pieces (practical light fixtures, wall receptacles, chase lights, etc.).
2/ Tie in portable dimmer rack and audio rack feed cables up to 240 volts, 100 amps, three-phase hydro; or 240 volts, 200 amps three-phase generator-powered.
3/ Repair dimmer units, configure portable dimmers for single-phase or 3-phase power.”

49 “BC Electrical Certification Update”, StageWorks magazine, October 1994

The second job in the above list could be performed by an LE holder provided the voltage and current levels are not above those allowed by the LE certificate.

Not all restricted work must be performed by licensed personnel. An LE holder may supervise two unlicensed workers performing work at the LE level. An FE holder may also supervise two unlicensed workers.

Ian Pratt, a theatre technician from British Columbia, who participated in this process also states:

“Note that the new certificate program is not itself a tightening of regulations. The B.C. Electrical Safety Act, which has been in force for years, already prohibits unlicensed persons from doing much of the work which many of us take for granted. The FE and LE simply make it possible for entertainment-industry technicians to become qualified and do their jobs legally, whereas in the past only a fully-qualified electrician could have done so.”

50 “BC Electrical Certification Update”, StageWorks magazine, October 1994
The industry made an effort to ensure working technicians would not lose their jobs due to the new licensing requirement. The Safety Branch allowed an eight-month grace period. Local technical colleges ran preparatory courses, and the IATSE locals affected ran code courses for their members.

When asked if the program had eliminated the perceived deficiency that had begun the process, Richard Holden, a lighting services company manager responded:

“Of course we still have our problems, but there has been a marked improvement in safety awareness among the electricians. And because of the card in their pocket, there’s a certain level of pride that wasn’t there before....”\(^{51}\)

\(^{51}\) Personal correspondence
German Stagehands’ Licenses

Germany has a licensing program for technical theatre supervisors. State authorities issue and administer the license. The program has four licenses: Buehnenmeister (Stage Manager), Beleuchtungsmeister (Chief Electrician), Technischer Leiter (Technical Director), and Pyrotechniker (Pyrotechnic). These licenses are for supervisory personnel only. The regular crew members are unlicensed.

The Stage Manager is responsible for scenery construction, safety, coordination of scene-changes, and rigging. Candidates for this license must come from a technical background. A prior history of employment as a mechanic or electrician might be an example. The licensing process begins with a class, which covers theatrical concerns such as stagecraft, statics, knots, etc. The course is followed by an exam. Only Licensed Stage Managers are permitted to head up crews of Buehnenerbeiter (stagehands).

The Chief Electrician is responsible for all stage lighting and projections. The licensing process is similar to that of Stage Manager. These people head up crews of electricians.

The exams for these licenses take approximately three days each, consisting of written, oral, and practical sections. Subjects covered include general stagecraft, statics, rigging, math, and problem solving. Additional topics include fire prevention and health & safety codes. To take the test, an applicant must demonstrate professional experience in the field. The requirement is three years of experience for applicants without a college degree, and one year for college graduates. There is a mandatory one year waiting period between testing for Stage Manager and Chief Electrician.

A Technical Director is someone who is both a Chief Electrician and a Stage Manager.

The Pyrotechnic license applies to anyone doing fireworks; outdoor fireworks displays are covered as well as indoor special effects. This license must be renewed every two years.
British Theatrical Certification

The first evidence of an English program of technical theatrical certifications, uncovered by this research, came from a book entitled Focal Guide to Safety in Live Performance, edited by George Thompson, Ceng, MIEE. Inside a chapter discussing training was an alphabet soup of organizations and programs including ABTT (Association of British Theatre Technicians), AETTI (Arts & Entertainment Technical Training Initiative), and NVQ’s (National Vocational Qualifications). An investigation of these acronyms revealed an extensive certification program that includes theatrical technicians, but also stretches across several other fields. This group of private programs is part of a government effort to overhaul the traditional apprenticeship and vocational training processes. According to Joe Aveline, deputy chairman of the AETTI, the overhaul is a component of a larger European Community effort to support the ability of workers to freely cross international borders in search of employment.

National Vocational Qualifications

The basis of this program is the “National Vocational Qualification.” From “A Brief Guide to NVQs & SVQs in the arts & cultural industries”:

“National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs) are based on standards of competence, set by actual practitioners in the area of work to which they relate. Consequently, standards in, for example, the media have come from technicians, journalists, producers, scriptwriters etc., while warders/attendants, curators and conservators have been working on museum and gallery qualifications.

The key points about NVQs/SVQs are:

They are modular in structure, with each ‘module’ known as a Unit of Competence...

...The Units are designed to be transferable from one occupation to another wherever possible, to help career changes as well as career progression...

...The content of an NVQ/SVQ is essentially the standards of performance which a candidate must reach, and provide evidence against, in order to be deemed competent...
assessments of your competence is not tied to attendance
/enrollment on any particular training programmes - it can
occur when sufficient evidence has been gathered (through
current employment, for example) against the standards,
whether that be for one or more units.”

NVQs are administered by private organizations under the supervision of the British
government’s Employment Department and the National Council for Vocational Qualifications.

All NVQs have the same basic structure. This is intended to make all of the
individual programs easier to understand, ensure comprehensive coverage to all of the
different vocations involved, and facilitate career progression for individuals. NVQs are
awarded at five levels:

“Level 1
Competence in the performance of a range of varied work
activities, most of which may be routine and predictable.

Level 2
Competence in a significant range of varied work activities,
performed in a variety of contexts. Some of the activities are
complex or non-routine, and there is some individual
responsibility or autonomy. Collaboration with others, perhaps
through membership of a work group or team, may often be a
requirement.

Level 3
Competence in a broad range of varied work activities
performed in a wide variety of contexts, most of which are
complex and non-routine. There is considerable responsibility
and autonomy, and control or guidance of others is often
required.

Level 4
Competence in a broad range of complex, technical or
professional work activities performed in a wide variety of
contexts and with a substantial degree of personal autonomy.
Responsibility for the work of others and the allocation of
resources is often present.

Level 5
Competence which involves the application of a significant
range of fundamental principles and complex techniques across
a wide and often unpredictable variety of contexts. Very
substantial personal autonomy and often significant
responsibility for the work of others and for the allocation of
resources feature strongly, as do personal accountabilities for

52 From “A Brief Guide to NVQs & SVQs in the arts & cultural industries”
Organizations awarding NVQs represent many vocations including performance, theatre management, stagecraft, publishing, industrial design, museum services, photography, and film and video technology. Actors, Stage Managers and Theatre Managers are under the supervision of the Arts & Entertainment Training Council (AETC). The Arts & Entertainment Technical Training Initiative administers the stagecraft NVQs.

Arts & Entertainment Technical Training Initiative

The AETTI is the organization responsible for the development and administration of the NVQs for “all non-performing disciplines within the live entertainment industry.” As of this writing the AETTI had 12 NVQs either accredited or under development.

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The individual subject requirements for each NVQ are very well delineated, although some of the actual units are a bit confusing. Here are the required Units of Competence for the Level 2 Scenic Fabrication and Level 2 Flying NVQs.

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53 From “A Brief Guide to NVQs & SVQs in the arts & cultural industries”

54 From the AETTI NVQ application packet
Level 2 Core Units (part of each level 2 stage NVQ):

Unit 210
**Establishing and Maintaining Working Relationships**
Establish and Maintain Working Relationships with Colleagues
Establish and Maintain Working Relationships with Immediate Line Managers/Supervisors

Unit 211
**Contributing to Health and Safety Within the Theatre Environment**
Maintain Safety in Work Areas
Limit Damage and Danger in the Event of Accidents and Emergencies

Unit 201
**Maintaining Performance Conditions**
Unpack and Organize Elements
Maintain the Cleanliness of the Performance Area and Effects

Unit 202
**Positioning and Operating Access Equipment**
Erect and Position Mobile Access Equipment
Position and Secure Ladders to Meet Access Requirements

Unit 203
**Getting Out**
Pack cased items
Strike Performance Components
Load Items for Transportation

Level 2 Scenic Fabrication Units:

Unit 290
**Applying Decorable Finishes**
Affixing Woven Fabrics
Affixing Non-Woven Fabrics

Unit 236
**Provide Dimensional Positioning (Straight Frames)**
Establish Suitability of Information Source Materials and Components
Provide Reference Marks for Setting Out
Contribute to the Provision of a Healthy and Safe Work Environment

Unit 237
**Assemble Components to Form Products (Straight Frames)**
Establish Suitability of Materials and Components
Position and Secure Materials and Components
Contribute to the Provision of a Healthy and Safe Work Environment

Unit 238
**Install Finishing Components (Vertical and Horizontal)**
Establish Suitability of Materials and Components
Position and Secure Materials and Components
Contribute to the Provision of a Healthy and Safe Work Environment

Unit 239
**Install Finishing Components (Opening and Moulded)**
Establish Suitability of Materials and Components
Position and Secure Materials and Components
Contribute to the Provision of a Healthy and Safe Work Environment

Unit 240
**Produce Products From Procured Materials (Portable Power Tools)**
Prepare, Set Up and Establish Suitability of Machinery and Materials
Modify Materials to Form Products
Contribute to the Provision of a Healthy and Safe Work Environment

Unit 241
**Produce Timber and Timber Based Products (Woodworking Machines)**
Prepare, Set Up and Establish Suitability of Machinery and Materials
Modify Materials to Form Timber and Timber Based Products
Contribute to the Provision of a Healthy and Safe Work Environment

Units 236 through 241 above are Units of Competence that also appear in Construction Industry Training Board NVQs and would therefore be transferable. The Level 3 Scenic Fabrication NVQ goes on to discuss irregular shapes, complex mouldings, maintaining shop supplies and reading drawings.

Level 2 Flying Units:

Unit 231
**Rigging Flying Systems**
Locate and Fix Directly Controlled Systems
Install Hoists

Unit 232
**Maintaining Flying Systems**
Maintain Counterweight Systems
Maintain Geared Systems
Maintain Rope Systems

Unit 233
**Setting Up Performance Components**
Control Lateral Movement of Hung Components
Mark Deads
Install Flown Components
Support the Co-ordination of Fly and Ground Operations

Unit 234
**Flying in Performance**
Operate Cues and Scene Changes
Set Fly Plots to Meet Performance Requirements

Prospective technicians can receive detailed standards for each NVQ from the AETTI for a fee. These technicians then go to one of a system of testing centers for

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55 From the AETTI NVQ application packet
56 From the AETTI NVQ application packet
assessment. NVQ’s are awarded following satisfactory completion of the assessment and the payment of a fee.

The AETTI program is still very young and has yet to have a significant impact on the industry. Truthfully, the first several English technicians contacted had not even heard of the program. The organizers are confident that this will change. Since the NVQs have the support of the government, the AETTI expects their program to become a requirement established by insurers, management and promoters.
Other National Programs

There were other programs briefly uncovered during the research, but they did not lend themselves to verification. One Internet respondent suggested that Austria and Holland appears to follow the German model. Rocky Paulson, a commercial rigger, made reference to a rigging license for entertainment technicians in Australia. Another Internet respondent talked briefly about a peer review system in emergence, also in Australia. Finally, a Brazilian technician interviewed at the USITT conference in Ft. Worth said that the Brazilian government issues stagehand’s licenses through a program administered by a theatrical labor syndicate. Although none of these programs were verified, this section still demonstrates an active level of theatrical technical certification abroad.
Part Three - The Theatre Industry Response to Certification

The third part of this project was to try to determine the feelings and preconceptions of theatre professionals in the United States regarding certification. Any certification program to be implemented, or the decision to develop certification programs, will be influenced by the people currently working in the field. Many professionals have deeply held feelings about this subject. The nature of those feelings are central to any analysis of theatrical certification.

The main research tool for this section was a direct mail survey. After receiving some of the survey returns, it became apparent that these responses alone would not paint as clear a picture as desired. Therefore, interviews were conducted to expand the amount of information gathered, and to represent communities not within the survey returns.

The sections that follow are the product of the above-mentioned interviews and survey. Additional industry response was obtained through letters that accompanied survey returns. Other sources of industry opinions were return postings, sent in response to inquiries posted in Internet usegroups. The usegroups used for these discussions were: alt.stagecraft and rec.arts.theatre.stagecraft.

To avoid confusion, “licensing” and “certification” are used interchangeably in the interview sections that follow. These discussions deal with whether any action should be taken at all. The nature of that action, whether the program should be a certification or a license, would be a topic for the next step in the process.
Actors Equity Association

“62 SAFE AND SANITARY PLACES OF EMPLOYMENT.
(A) The Producer agrees to provide the Actor with safe and
sanitary places of employment.”

Concern about technical competence is not limited to technicians and technical managers. Every day, members of the Actors Equity Association (AEA) put their lives and well-being into the hands of various technical personnel. The safety of its membership is of primary importance to this union. Any discussion of technical certifications would be incomplete without participation from the actors who make their living performing on the sets technical professionals design, install, and run.

The information for this section was obtained in an interview with Equity’s national safe and sanitary representative, Kimberly Rimbold. In her responses, Ms. Rimbold is speaking for her Union. The quotations included in this section come from the Agreement and Rules Governing Employment Under the Production Contract. This contract refers only to Equity productions of The League of Broadway Producers, but the structure and the content are representative of the conditions Equity would like to have at all production levels.

“(H) Inherently Dangerous Conditions Prohibited.
(1) No Actor shall be required to perform any feat or act which places Actor in imminent danger or is inherently dangerous, nor shall any Actor be required to perform in a costume or upon a set which is inherently dangerous. It is not the intent of Equity to interfere with proper artistic judgments of the Producer but only to protect the Actor from injury which may jeopardize or terminate a professional career. The producer shall advise Equity as soon as possible when, in Producer’s judgment, there is a potentially dangerous situation. If Equity deems the situation to be one which should be prohibited by this section and the Producer does not agree, the matter shall be submitted for prompt consideration by an industry committee composed of the Executive Director of the League of American Theatres and Producers, or his designee, representing the League and the Executive Secretary of Equity, or his designee,

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57 Agreement and Rules Governing Employment Under the Production Contract
In general, Equity believes that actor safety is becoming a more important factor for technical personnel. While AEA is sure that this is not at the top of the list for shops and stagehands, there is no concern that safety is being deliberately overlooked.

Equity’s concerns about technical competence cover two broad production categories: Broadway theatre and the rest of the country. The situation in New York is unique because of the immediate presence of the AEA offices. This proximity makes it much easier for the union to monitor productions in the New York metro area than in its other jurisdictions.

Equity believes the skill level of technicians working on Broadway productions is generally satisfactory. On the Broadway level, there appears to be neither an actual nor perceived competence problem. There have been no major problems resulting in actor injuries at that level. Equity has no established procedure for tracking accidents that do not result in an injury report being filed. This is not to say that the Actor’s union does not believe that some type of certification for stagehands would not be a good idea, but at present Equity is satisfied with the IATSE Local One employees. The installations of shows have been acceptable in the past. The majority of running problems occurring during shows appear to not be the fault of the stagehands, but rather a result of technical breakdowns that could have been foreseen at the shop level. The current relationship between Equity and Local One allows them to address complaints about specific stagehands on a per show basis.

The AEA has concerns about the increasing complexity of the designs for Broadway shows (in fact of shows at all producing levels). While less concerned about the installation and running of the productions, the union is becoming more concerned with the technical design phase of the production process. Trends toward larger sets, more impressive moving scenery and the corresponding increase in complexity of motion control systems have caused the Actors’ union to be less confident with the

58 Agreement and Rules Governing Employment Under the Production Contract
current technical designers. Equity perceives a need for some form of certification of these production participants.

With New York productions, Equity believes that they receive information about upcoming designs in time to discuss potential problems with producers. The union currently relies on this type of communication to address their technical concerns. In the past, Equity has stepped in at the design phase to ask for changes to technical solutions that impacted actor safety. So far these requests have been honored. They have never demanded a major technical design change. They do believe they are able to do so if necessary.

Ms. Rimbold stated that for Broadway shows the AEA believes that there are several areas that lend themselves to certification. Whether certification would be are theatre specific, or would come from currently existing programs does not seem to be a concern of Equity. She suggests the following as Equity concerns. Scenery and rigging technical design solutions should be under the supervision of licensed engineers. Motion control should be under the supervision of certified motion control designers. Also, pyrotechnics should fall strictly under the supervision of licensed designers and operators. This was the only point in the discussion where Ms. Rimbold put forth the idea of certified operators. While asking for licensed pyrotechnic operators, she did not mention certified rigging installers (although as listed above she did suggest certified rigging designers).

The Actor’s Equity Association is aware that many shops do consult with Professional Engineers on a unit by unit basis, and do use certified welders in critical applications. While they are glad to see this as part of the process, they believe their members would be safer with more certified participants in the production process.

Ms. Rimbold suggests that the concerns become somewhat more grave when addressing theatre away from Broadway. Although the larger LORT theatres appear to be safe enough, the employees of smaller theatres and especially those of summer stock theatres are a source of genuine worry. Because many of these productions happen far from the nearest Equity representative, or are over before the union hears about potential problems, the competence of the technicians involved becomes a more important issue.
Speaking about smaller theatres, Ms. Rimbold stated that the problems at smaller production levels have their roots in the same place as the Broadway productions. Artistic Directors, in an effort to bring in more audience, are stretching the limits of their technical staffs and budgets. At this level, the AEA does have genuine concerns about the skill level of the workers building, installing, and running the shows. Ms. Rimbold suggested that the relative powerlessness of technical employees in these organizations and the positive, community, can-do, cowboy mentality of those employees makes for a potentially dangerous combination. There are two things that Equity would like to see happen at this level. The first would be for the producing entities to be realistic about the level of technical production they are equipped to present. If the decision makers at this level would be more pragmatic about the limits of their staff and materials budgets, they would be less likely to place actors in jeopardy. The second would be some type of certification program.

A summer stock sized company certification program would have to begin at the carpenter level. This program would have to assure a given level of knowledge of correct stagecraft practices including construction and rigging techniques. Obviously, this type of program would have little impact if it did not also certify the technical directors supervising those stagehands. This technical directors’ certification would also cover general stagecraft principles. These certifications are theatre specific. Ms. Rimbold did not suggest who should administer such a program, but did express an interest in Equity participation in the formulation of certification practices.

A certification program would obviously cost the stock companies some money. Since certification would most likely carry a cost to the certified individual, it would not be unusual for those workers to pass that cost along to their employer. Ms. Rimbold agrees, and believes that this would be a worthwhile cost to pay. To that end she suggested that Equity might make concessions in negotiating theatre contracts to allow funds to be made available for certified technical personnel. These concessions might be represented by lower pay or fewer contracts. Ms. Rimbold recanted a bit by saying a more realistic approach would be a freeze of Equity contract terms for a given period. This would free up funds for use on technical personnel. This type of proactive suggestion seems to indicate that the safety concerns at this level are very real.
Continuing in the Equity contract vein, the union believes that technical concerns may have a place in each theatre’s negotiated agreement. If there was a technical certification, the AEA might require certified technical personnel or limit the number of uncertified workers supervised by a certified manager as a stipulation of a theatre’s contract.

Ms. Rimbold believes that AEA members have some power to address safety concerns about technical solutions. In many stock situations, an actor has the power to make a change just by saying they are uncomfortable with a particular effect. Equity believes that their members generally have the training to spot safety problems and the necessary language to adequately communicate their concerns. However, there are some pitfalls to relying on actor regulated technical guidelines. First, in an environment where there are few prospective sources of work, an actor may be hesitant to complain. The fear of getting a reputation as a complainer, and therefore losing future employment might cause an actor to overlook some concerns. In areas far from Equity offices, this problem is compounded by the fact that the actor cannot really complain to the union. Any reaction from Equity would probably not be swift enough.

The second problem to relying on actors to keep technical solutions safe has to do with the Equity members’ interpretation of their own best interest. Many of the theatres’ contracts with the AEA include a provision for “Extraordinary Risk Pay.”

“(D) Extraordinary Risk Payments. An Actor called upon to perform ‘extraordinary risk’ shall receive not less than Fifteen Dollars ($15.00) per week above contractual salary, such payments to begin at the time of such assignment.

(1) ‘Extraordinary risks’ are defined as performing acrobatic feats; exposure to weapons, fire, pyrotechnic devices and the taking of dangerous leaps, falls, throws, catches, knee drops, or slides....”

The idea is that actors receive extra compensation for performing something they feel is unsafe. In many cases actors negotiate this payment on a per production basis. Regardless of the number of “risks”, the rate of pay is $15 per week. Many scenic and rigging effects that could pose a safety problem, due to a crew of questionable

59 Agreement and Rules Governing Employment Under the Production Contract
competence, also qualify the actors for “extraordinary risk” pay. In these cases the actors may elect to overlook safety concerns. Although Equity has tried in the past to phase out this provision, on each occasion they are met with opposition from their membership. Apparently many actors would rather have the additional pay than a safer environment. In those instances, Ms. Rimbold indicated that certified technical personnel might be a better protection to Equity members than their own judgment.
International Alliance of Theatrical Stage Employees

“The Organization is best known as the I.A.T.S.E. Often the members speak of it as just the I.A. It can best be described, however, as the union of people behind the scenes in the manifold media of show business.

The I.A.T.S.E began in 1893, when show business was confined almost entirely to the stage. During the next twenty years, the stage carpenters, propertymen and electricians pioneered a drive for union recognition in the theatre -- and finally established their craft as one of the highest paid and most respected in America....

... In legitimate theatres, including specifically some 35 of them in the Broadway area in New York City, and in concert halls, art and cultural centers, auditoriums, arenas and other like facilities, as well as on industrial and other types of road shows that travel from one city to another, I.A. members play an essential role, serving as stagehands, ticket sellers, wardrobe personnel, make-up artists and hairstylists, ushers, ticket-takers and doormen and maintenance employees.”

Certification of theatre technicians would substantively affect members of the IATSE. Members of this union participate in the fabrication, installation, and running of many types of entertainment presentations. The union has a strong tradition of bringing workers “up through the ranks”, learning their craft as they go. The work being performed by this membership is increasing in complexity in an analog to the changes in scenic presentation.

Initially, the only IATSE respondents represented in this inquiry were several certification survey responses. Many responses to the survey presented questions about the IA’s place in the conjectural certification program. Although some IA members did respond, it seemed prudent to get a response from the union leadership. To obtain this response, interviews were conducted with Alan Myers, a Local One Business Agent, and Karen Pizzuto, an IATSE International Representative. In both cases, these representatives were speaking for their respective organizations.

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60 International Alliance of Theatrical Stage Employees Pamphlet “An Introduction to the I.A.T.S.E.”
Local One

IATSE Local One represents stagehands in the Broadway theatres, and shops in Manhattan and the Bronx. Local One believes that some type of technical theatrical certification program would be a good idea. Mr. Myers stated that he believed that such a program would be beneficial to both Local One members and to the industry as a whole.

The type of program he described would have several narrow, specialized certificate. The certification would be for scene shop floor and theatre stagehands. Types of positions to be certified would include welding, rigging, motion control, and automated lighting operation. The certification programs could come from existing programs, or could be original, dedicated theatrical programs. Certification might be a requirement for members in jobs that lend themselves to certification. Mr. Myers did point out that a stagehand should be able to make a reasonable living without performing functions that would require certification. There was no mention of a need for certification of those persons doing the technical design for the shops. Although some of those technical designers are Local One members, those jobs are not normally under the jurisdiction of the local. He also stated that jobs such as basic scenery construction should not require certification, and that any certification program should include provisions for uncertified stagehands to work under certified supervisors.

Local One would like to participate in the development of the certification programs’ administrative processes. Mr. Myers did not express any interest in actually administering the program. He believes Local One would not need involvement in the content development of the programs as an organization, since many members participate in technical organizations such as USITT and the Entertainment Technology Services Association (ESTA). Members could assist in the formulation of specific programs at that level.

Mr. Myers noted that there has been an industry perception that some of its members are underqualified for the work that they do. That feeling has been lessening with the introduction of new technologies. The work is becoming complex enough that the idea that someone could slip through without good skills is becoming harder to
believe. A program to certify members would help to further debunk that perception. Narrow, specialized certification programs would also help to secure jobs for members of the local. Management’s replacement of local crew due to a claimed lack of requisite skills would be more difficult with certified members. Conceivably, Local One could even gain jurisdiction over some jobs not currently within its purview if its membership contained individuals certified for those tasks.

Mr. Myers would not put a dollar figure on the amount of money it would expect individual members to spend to obtain and maintain their certification. Under most circumstances, Local One would not expect theatre producers to cover the cost of certifying its membership. However, if a producer wanted to certify a stagehand for a specific task on a particular show, the local would expect the producer to bear the cost of that certification. An example of this situation would be training a stagehand to be a certified Vari-Lite operator. Mr. Myers also suggested that upon implementation of a certification program, the local would probably seek a higher, "certified stagehand" pay rate in the next contract. Normally, Local One members work for too many different employers for producer sponsorship of certification to be practicable. Mr. Myers stated that, where appropriate, members should have to periodically recertify.

Mr. Myers was hesitant to offer supposition about the attitudes of other organizations that work with Local One. The local believes that whether producers would cooperate with the implementation of certification programs would depend on the particular producer. Local One believes that cooperation from other theatrical unions would be unnecessary for the implementation of a program for technicians. Mr. Myers would not speculate on attitudes or any possible involvement of the I.A.T.S.E. International concerning technical certification programs.

**International**

The IATSE is an organization representing over 800 local unions. Along with the theatre employees listed at the beginning of the IATSE section, the IATSE is also composed of locals made up of projectionists, film technicians and television technicians.
"In television, the combined crafts of stage and screen are utilized in ever-growing abundance. Many carpenters, electricians, and propertypmen who served their apprenticeship in the theatres, help put on live TV productions. And the work of many motion picture technicians goes into the making of shows for TV. Masters of numerous additional techniques are needed to bring live, taped and filmed programs to the public. Thus the traditional I.A. projectionists, sound service engineers and recording engineers now are supplemented by I.A. video engineers, audio engineers, transmitter engineers, maintenance engineers and a host of other television technicians....

...I.A. members who help produce film and video production for theatres, television and other purposes work in a wide variety of classifications. Among them are art directors, story analysts, cartoonists, set designers and set decorators, scenic artists, art craftspersons, graphic artists, set painters, grips, electricians, propertypersons, teachers, costumers, make-up artists, hair-stylists, motion picture and still camera-persons, sound technicians, editors, script supervisors, laboratory technicians, projectionists, utility workers, first aid employees, inspection, shipping, booking and other distribution employees. A Motion Picture Salesmen Department was established in 1957."

The International also believes that some type of technical certification system may be a good idea. Ms. Pizzotu suggests that both technical designers and stagehands should have certification programs, but that the programs should be separate and different as the job and responsibilities at each of the levels are not the same. At the shop worker and stagehand level, the International perceives a need for certification of a wide range of positions. Some of these positions would include welders, riggers, carpenters, and electricians. Many of the local unions already have training programs for electricians based on the National Electrical Code. The only specific technical design area suggested for certification was motion control. However, Ms. Pizzotu expanded her response to include “any area that involves equipment and safety concerns.”

A theatrical certification program based on existing industrial programs could serve as a foundation. However, the nature of these technical tasks is too theatre specific for those existing programs. Theatre specific certification programs are necessary to

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61 International Alliance of Theatrical Stage Employees Pamphlet “An Introduction to the I.A.T.S.E.”
accommodate the narrow theatrical applications. The International is open to the idea of certified supervisors for uncertified workers. The implementation of such a strategy would be dependent on the particular task involved.

The IATSE has been involved in cooperation with other theatrical organizations in the creation of standards. Ms. Pizzuto suggests that the formulation, implementation, and administration of technical certification programs should be approached in the same manner. A prospective committee would include working union members (both representatives of the international and of individual locals), educators, equipment manufacturers, and safety professionals.

The IATSE believes that this certification should only be available to I.A. members. A technical certification program could replace some of the individual locals’ apprentice programs. The International recognizes that there will continue to be people working within the industry who are not members. Ms. Pizzuto could not speculate on the likelihood of the International administering a certification program for workers who were not I.A. members because of the substantial commitment of resources it would require. Since each IATSE local is autonomous the International cannot say whether certification would be required of I.A. members. Ms. Pizzuto stated the International would likely take a position encouraging implementation.

The International does not believe there is any industry reputation for incompetence. Therefore, certification simply to combat that perception would be unnecessary. Ms. Pizzuto does believe that a certification program would probably add to the skills of the membership, and that certification could be used as a negotiating tool in future contract negotiations.

The appropriate cost to obtain and maintain a certification is an unknown to the International. The I.A. would not expect producers to cover the cost of certification for the workers. Some locals that currently have training programs split the costs with producers, since the training is mutually beneficial. A similar arrangement would be appropriate for a certification program. Unlike Local One, the International does not see an automatic relationship between certified workers and a higher pay scale. As stated above, a certification program could be a bargaining chip in the negotiation of future
collective bargaining agreements. Any certification program put in place should include appropriate re-certification.

The International was also not eager to speculate on the posture of other organizations. Regarding the individual locals, the International can only advise and encourage practices it feels would be beneficial. The International would also be in a position to encourage producers and owners to be in favor of certification. Ms. Pizzuto believes the I.A. would work in cooperation with the other theatrical unions on implementation of a certification program.
**Commercial Theatre**

One of the most vocal groups opposing a theatrical certification is a segment of the responding commercial theatre technical managers. Although their numerical survey responses did not bear out this negative opinion (the survey results follow in the next section), letters and interviews have produced several objections. Some objections have been to theatrical certification, and some have been to the concept of certification in general. The information forming the basis of this section comes from interviews with Tien Tsung Ma - a commercial shop project manager, Rocky Paulson - a professional rigging contractor, and correspondence with Evan Gelick - a commercial shop project manager.

Rocky Paulson is a professional rigging contractor. He regularly appears as an instructor at rigging workshops, and has published numerous articles on rigging, liability, and rigging safety. Mr. Paulson expressed several objections to technical certification programs. His overall impression is that licensing or certification is a nice enough idea, but that the implementation is not practicable, and in many cases not fair. His major comments were about a possible rigging certification. Mr. Paulson believes that the field of entertainment rigging is too general to accommodate a single certification. He does agree that several specific certificates could properly cover the field, but he has other objections to that approach. Mr. Paulson is currently a certified wire rope sling inspector. He paid a $400 fee as part of that certification. The certificate must be renewed every two years. He maintains this certification not for safety considerations, but because the market has forced him to do so. It is his informed opinion that if there were several, (narrow) rigging certificates, that the market would place an unfair burden on riggers to pay for maintaining their accreditation. When asked if that cost could not be passed on to the riggers’ employers, Mr. Paulson answered as an employer. As an employer of riggers, Mr. Paulson would rather spend his money hiring reputable employees than funding a certification. When asked if a certification would make it easier to hire qualified people he responded that he does not have a problem with hiring now. He went on to say that employers in favor of a certification were simply showing themselves to be lazy. If their current hiring practices are yielding unqualified personnel, then the problem is their hiring practice, not
available labor. Mr. Paulson also said that he has worked with licensed riggers in the past. While working on touring productions, he worked with licensed riggers in Australia and licensed stagehands in Germany. His professional evaluation of that work force included an observation that they were no better trained than a good crew in the United States.

Mr. Ma and Mr. Gelick are both technical managers at commercial scene shops in the New York City market. They both regularly work on projects that have the participation of certified or licensed personnel required by contract. Both of them stressed that certification does belong in the industry, but there is simply no need for a theatrical certification. Mr. Gelick expressed his thoughts about certification programs in a letter accompanying his survey response:

“... certification does have a place in the technical theatre world, in certain instances. The three obvious examples that come to mind for me are: licensed engineering (mechanical, electrical, and structural), certified welding, and licensed electrical work....

...However, since these licenses and certifications are already available from pre-existing organizations, and are generally accepted as industry and legal standards, I see no real need to invoke a secondary ‘theatrical’ certification covering the same subjects....”

Mr. Gelick also expressed a concern that many employees who have established themselves as competent, might have to leave the industry due to certification rules.

Mr. Ma went a step further. He also agrees that the use of accepted licenses and certification programs should continue. However, Mr. Ma questions the reliability of many existing programs. He believes that the individuals and organizations involved in licenses and in welder certification have shown themselves to be reputable. It is his opinion that smaller programs, such as the Fluid Power Society or the American Institute of Motion Engineers may be less so. Mr. Ma believes that these organizations are not necessarily responsible to this industry, and that a manager has no idea what their qualification methods are. Further, he believes that licensed engineers, electricians and certified welders have an extremely strong incentive to perform up to standards. These technicians do not want to lose their accreditation, as several jobs require workers

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62 Personal correspondence (underlining included by Mr. Gelick)
to hold these certificates; and the sponsoring organizations have disciplinary procedures in place to punish offenders. Since hydraulic tasks do not legally, or contractually, require certified personnel under normal circumstances, a certified Fluid Power Technician does not have the same incentive.

Again, it is noteworthy that even though these were the vocal responses, the commercial theatre response to the statement, “I believe that some sort of technical production certification would be a good idea.” was 75% affirmative. Presumably, this should be interpreted as the type of support indicated above, of continued use of existing programs.
Results of the Certification Survey

Overview

The centerpiece of this project is the Theatrical Technical Production Certification Survey. The survey asked for responses to statements regarding a possible technical certification program. The questions fall into roughly three categories: hiring, workplace safety & efficiency, and certification logistics. Except for question number one, which required a yes or no answer, responses were a numerical entry on a scale of one to nine. Depending on the question, the scale would represent Strongly Agree to Strongly Disagree, Very Often to Never, or Always to Never. The respondents could also include written comments to further clarify or characterize their numerical entries.

From the survey instructions:

“For the purpose of this survey 'certified technical personnel' are employees who have completed some program of industry wide requirements. These requirements could include exams, registration, municipal or state licensure, board certification, training programs, or supervised internship, but the exact nature of the certification should not be critical to the survey responses. The questions are designed to bring out the issues respondents believe a certification should address -- not specifically how to address them.”

Appendix A contains a complete copy of the survey including questions, instructions, and cover letter. A summary table of the survey results and a demographic breakdown of the respondents also appear as Appendices B & C.

The following is a review of the responses to the survey. The review will consist of a presentation of each question, a summary of that question's significance to the survey, and a description of the predicted results. A graph of the average numerical responses by various demographic groups follows each initial presentation. The groupings used for the survey analysis are:

- All: All Responses
- IA: IATSE members only
- Union: Union members only (any unions)
- No Union: Non-union respondents
- Hire: Respondents with hiring responsibilities
- No Hire: Respondents without hiring responsibilities
- Comm.: Respondents working in commercial theatre
Analysis groupings continued:

- Edu.: Respondents working in educational theatre
- Not Profit: Respondents working in Not for Profit theatre
- No Degree: Respondents with no college degree
- BA/BFA: Respondents holding only bachelor’s degrees
- MA/MFA: Respondents holding a master’s degree
- Q1 No: Respondents who believe certification is not a good idea
- Q1 Yes: Respondents who believe certification is a good idea

Each of these groups is a sub-group of a larger division. IA, Union, and No Union fit together for comparison. There are also divisions for hiring, type of producing organization, educational level, and general certification attitude. Following the graph will be a group of selected quotations from the comment section of that question. The respondents have been guaranteed anonymity to elicit more candid comments. The comments included are not necessarily representative of all respondents, nor are they always the most incendiary. Generally, one comment has been provided for each type of statement made by the respondents. The number in parentheses following each quotation is that respondent's numerical response to the question. It is interesting to compare some of the numerical responses to the content of the quotation. Some of the comparisons suggest a possible weakness in this form of information gathering, as the numerical and written responses do not always seem to match. Concluding each questions presentation will be a brief analysis and commentary on the results. The ranges provided in this analysis are the range of demographic averages and do not consider the average responses from the Q1 groups. The typically large spread between these two groups does not seem to reflect the particular issue being discussed in each question, but rather a response to the larger certification issue. There is no presentation of the range of individual responses. In each case this range is very nearly 9, since at least one respondent persistently answered at each end of the gradient.

Before getting to individual questions, some overall analysis is appropriate. The survey questions specifically avoided content issues. The idea was to get a reaction to the overall concept of certification without becoming bogged down in a discussion of specific skills. It should be possible to discuss rigging certification without specifying knots riggers would have to know. For the most part, respondents were able to make
that distinction. However, some survey respondents did question certification content as a stipulation to many of their answers.

Another problem that presented itself in the responses was emotion. In a small number of the surveys returned, it was obvious that the respondent had strong feelings on the issue and simply filled out the entire survey with negative responses. Although these responses are legitimate, this type of response may color the tabulated results. These responses would probably still have been negative if considered with a clearer head, but the magnitude of each response might not have been as great. The Q1 groups also produce an interesting effect. On many questions, the greatest range between averages is between the group that answered “yes” and the group that answered “no” to question #1. When this was the case, the rest of the average responses are usually in a tight group. This would seem to suggest that even though both groups recognize a specific problem, a problem which certification might address, that recognition does not affect their posture regarding certification.

A similar problem arose having to do with certification costs. Some respondents seemed to have decided early in their surveys that their particular venue would not be able to bear the costs of a certification program or afford to hire certified personnel. Typically in these returns a great deal of the questions were unanswered, with the comment that they could not afford certified workers. Since these responses were blank they do not affect the tabulated results. This may be unfortunate because the majority of these returns came from smaller institutions. Leaving them out reduces the real impact of those surveys in any demographic comparison.

The single greatest disappointment with the returns was the lack of range in responses. Substantive demographic comparison requires significant numerical differences. Even though individual responses in each of the demographics ran throughout the range, consistently the averages remained very close together. Except for the 100% range to question one (which had polar responses), the greatest range of responses to any question was 2.7 points. On the scales used for the responses this would only range from Strongly Agree to Agree. Moreover, in most cases the entire range of responses fell in the somewhat agree-no opinion- somewhat disagree middle range. In spite of the compact range of responses, trends do demonstrate themselves in a number
of cases and are worth exploring. Also, if the responses to all questions in all groups had come back as 5 points with a 0 point range the results would still be valid and would still merit discussion.

**Question #1: I believe that some sort of technical production certification would be a good idea.**

This question is as much as a demographic question as an informational question. The purpose was to discover the respondent's attitude regarding theatrical technical certification without any preliminary discussion of any underlying reasons for such a program. With the answers to this question, the respondents divided into groups either generally supporting or opposing a certification program. These groups were then available for comparative analysis.

The expected overall result for this question was something close to a 50% positive response. Union members were expected to answer negatively because of the possible challenge to their competence. Due to the possible utility of a certification to managers with hiring responsibilities, they were expected to be more positive than their non-hiring counterparts. Since a certification program would represent an equal intrusion to owners and producers in all types of theatre, their answers were expected to be similar. Positive responses were expected among respondents with a higher level of education. They would probably be less likely to see a certification as a threat to their perceived competence.
Comments were not solicited for this question.

The range of responses for this question was 15%.

As the graph shows, the overall response was 72% “yes”. There was little or no support for the expected results. Most surprisingly, union workers were more in favor of certification than their non-union counterparts. Respondents with hiring responsibilities, although still marginally in favor of a certification, were less receptive than those without that responsibility. The education based results were the reverse of the predictions. One possible reason for this is that each level of education completed serves some of the functions of a certification. Therefore, those without degrees would have more use for a certification than those holding degrees.

**Question #2: I have inadvertently hired incompetent production personnel.**

This is a hiring issue question. Currently there is no independent verification of competence for technical personnel in the theatre field. The purpose of this question was to determine if the respondents believe this is a problem; if without a certification program, they inadvertently hire incompetent personnel.

The expected results for this question were for those that hire and for those who hire the most (those in the commercial theatre) to have the greatest agreement with the statement. It was also expected that the overall incidence would be at the higher end of the scale (*Very Often*).
2. I have inadvertently hired incompetent production personnel.

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<tbody>
<tr>
<td></td>
<td>Very Often</td>
<td>Sometimes</td>
<td>Never</td>
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“Often people with good resumes & recommendations are actually very incompetent” (4)

“Rarely. And if I do I don’t hire them again” (8)

“I don’t do the hiring, but witness the results of, & yes, everyone has hired an incompetent who by the end of the season has become competent” (N/A)

The range of responses for this question was 1.68 points. Again, the actual results did not match the expected responses. The responses of those with hiring responsibilities were not much higher than the average for the group as a whole. Commercial theatre respondents had the lowest response average, meaning they most often hired incompetent personnel. A possible explanation for that is that since they likely hire a greater number of people they are more likely to hire incompetent employees.

The comments characterize the normal cause and response for this issue. In some cases prospective employees are able to portray themselves in a very favorable light. In cases where workers turn out to be incompetent, they are often “crossed off the list” for future calls. The last comment brings up an interesting point. There are those employees, who though incompetent when hired, are able to grow into a job and eventually meet expectations. Any certification system adopted by the theatre industry should be sure to make room for this circumstance.

**Question #3: I can trust a recommendation from a person I do not know.**

Again, this is a hiring issue question. Not having other means, references have become a primary means of assessing the skill level of prospective employees. During the process of hiring, managers are in the position of having to trust recommendations from people they do not know -- in many cases people made available by the job seeker. The reasons for including this question and the expected results were very much the same as those for question #2.
3. I can trust a recommendation from a person I do not know.

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<tbody>
<tr>
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<td>5</td>
<td>5.53</td>
<td>6.76</td>
<td>5.88</td>
<td>6.07</td>
<td>5.88</td>
<td>5.58</td>
<td>6.21</td>
<td>5.56</td>
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<tr>
<td>No</td>
<td>6.00</td>
<td>6.00</td>
<td>5.78</td>
<td>5.53</td>
<td>5.58</td>
<td>6.07</td>
<td>5.88</td>
<td>5.58</td>
<td>6.21</td>
<td>5.56</td>
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</table>

“Generally I find phone references very reliable” (3)

“Written recs. are virtually worthless, recommendations over the phone, or in person must be taken with a grain of salt.” (5)

“Depends on who is the person. A guy on the street - No, A department head - Maybe.” (5)

The range of responses to this question was 1.23 points. The generally neutral response to the question suggests that this is a problem that people are aware of and they are dealing with it.

**Question #4: Resumes accurately represent a prospective employee’s skills.**

This is also a hiring issue question. Frequently, the initial exposure to a prospective employee is a resume. Some stock companies currently hire production staff members on the basis of resume, recommendations, and a phone interview. Having addressed recommendations above, the survey now evaluates resumes.

The expected results for this question were a unified distrust of resumes for skill level information.
4. Resumes accurately represent a prospective employee’s skills.

1 2 3 4 5 6 7 8 9 N/A
Strongly Agree No Opinion Strongly Disagree

“No evidence of the quality of the work performed” (7)

“They represent a prospective employee’s skill @ writing a resume” (7)

“Yeah Right. Doesn’t everyone inflate their resumes?” (7)

“I have found a strong correlation between applicant’s skill in written communication and technical ability” (3)

The range of responses for this question was 0.68 points. This was the second most unified set of averages. Although unified answers, they were not as far to the disagree end of the scale as expected. Once again this would suggest a problem that people are aware of and they are coping with it.

The comments confirm that resumes are not a good source for information on technical competence. The last listed comment does suggest that although the contents of a resume may not be very informative, the demonstrated level of communication skill may be valid. This assumes that the applicant wrote the resume on their own.
Question #5: I would hire/insist on having a certified department head with responsibilities that are restricted to supervision.

This is a hiring issue question, with an aspect of certification logistics. The goal was to discover the industry’s willingness to bring managers into the production process in a purely supervisory capacity. Supervisors might be more able to control safety and quality if they do not also have direct production responsibilities competing for their attention.

The expected response would have been a unified disagreement to this statement. A routine practice is to stretch a production staff to its maximum efficiency. Restricting any person’s responsibility to supervision runs contrary to that norm.

5. I would hire/insist on having a certified department head with responsibilities that are restricted to supervision.

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<th>9</th>
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<tbody>
<tr>
<td><strong>Strongly Agree</strong></td>
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<tr>
<td><strong>No Opinion</strong></td>
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<tr>
<td><strong>Strongly Disagree</strong></td>
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“I like the idea of a certified dept. head, but only supervising is a drawback in the hands on field. They become heads because of their hands. Also, it’s a long time before even a significant portion would be certified.” (8)

“Depends on department, certainly safety related departments such as rigging, construction, welding.” (3)

“I’m the dept. head and am close to being certified (insane).” (N/A)
The range of responses to this question was 2.01 points. The responses were close to those expected, however possibly not as pronounced. Of particular interest in this group is the difference between the question #1 groups. Those respondents against certification appear equally against employees with no job aside from providing a certified presence. Another interesting response is the relative ambivalence of the IA respondents. They are the only group on the agree end of the scale. Perhaps since the IATSE members regularly participate in a system with rigidly defined duties, this idea is potentially less disturbing to them.

The comments for this question bring up two important points. Department heads placed in a supervisory only position may be inherently undermined in the minds of a staff who generally respect managers based upon empirical evidence. Having a certification might help to override this problem, but it is definitely worth consideration. The second comment suggests a gradient for tasks based on safety, saying that some jobs might require this level of supervision while others probably do not.

### Question #6: I would pay more/expect to be paid more for/as a certified technician.

This question is a hiring issue and management question. Existing certification literature suggests that obtaining a certification would increase a staff member’s value. This question asks if respondents would expect higher compensation for that additional value.

The expected results were for all groups to believe that they should receive higher pay. A lower rate of agreement was expected from those respondents doing the hiring, as they would still be expected to maximize their resources. Also, some disagreement was expected from commercial theatre respondents, as they probably already pay top dollar.
6. I would pay more/expect to be paid more for/as a certified technician.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
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</thead>
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<td>7</td>
<td>8</td>
<td>9</td>
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<tr>
<td>N/A</td>
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“Not if the job requires it, certainly” (5)

“Extra time spent to learn more about one’s craft, skills, etc. should help to further their position/income.” (1)

“You may expect to be paid more as a certified technician, but I would pay them as little as I could and still attract talented people.” (N/A)

The range of responses for this question was 1.19 points. The responses generally matched the expectations. Again, the respondents generally against certification are that much more against paying a higher rate for certified personnel.

The comments from this question express a wide range of responses. The first comment suggests if everyone received a certification, and that became the standard practice, then there would be no reason to raise the entire pay structure. The second comment shows an appreciation of the concept that people who put forth more effort to become better trained deserve compensation for that effort. The last comment shows management’s position that regardless of the assured level of competence, they will still try to get the lowest-cost, acceptable labor available.
**Question #7:** My company/the company I work for has hired currently licensed or certified industrial personnel to fill specific production requirements on a part time or outsource basis. (Please specify)

This is a hiring practice and workplace safety question. There is work currently being done within the theatre industry that falls under the jurisdiction of existing professional certification programs and licenses. The purpose of this question was to ascertain the frequency that these certified professionals are employed by theatre organizations.

The expected results for this question were that almost everyone would have used some certified or licensed person at some time. The rate was expected to be higher in the commercial theatre because they can afford to pay certified professionals; also, they normally participate in projects requiring the use of licensed personnel by contract.

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<th>Demographic Group</th>
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<td>All</td>
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</tr>
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<td>Union</td>
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<tr>
<td>Hire</td>
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<tr>
<td>No Hire</td>
<td>4.67</td>
</tr>
<tr>
<td>Comm</td>
<td>6.08</td>
</tr>
<tr>
<td>Edu</td>
<td>6.60</td>
</tr>
<tr>
<td>Not Profit</td>
<td>6.67</td>
</tr>
<tr>
<td>No Degree</td>
<td>5.64</td>
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<tr>
<td>BA/BFA</td>
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<tr>
<td>MA/MFA</td>
<td>6.40</td>
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<tr>
<td>Q1 No</td>
<td>5.86</td>
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<tr>
<td>Q1 Yes</td>
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7. My company/the company I work for has hired currently licensed or certified industrial personnel to fill specific production requirements on a part time or outsource basis. (Please specify)

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<tr>
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“Not so much hired as consulted.” (5)

“We have certified welders/alum. welders, truck drivers / fiberglass / electricians.” (1)
“Rigging for flying people.” (5)

The range of responses for this question was 2.00 points. The actual results were close to the projected responses. Commercial theatre respondents did have the highest rate of certified personnel use. Some of the personnel listed as used were licensed engineers, licensed professional contractors, licensed electricians, licensed pyrotechnic operators, certified welders, and certified fireproofers as well as licensed drivers. Those respondents in favor of certification engaged the services of licensed or certified personnel slightly more than those respondents who do not favor certification.

The comments suggest a possible adaptation to the current cost problem. In some cases, theatres have consulted licensed or certified personnel while continuing to use their own staff for the actual work.

The final quotation is worth noting for the following reason. Although a licensed professional engineer can be hired to design a flying system, a licensed professional contractor can be hired to install that system, and some type of site certification can be utilized by a venue to train people to operate the effect, there is currently no such thing as a rigging license or certification that applies to theatre. Hiring a professional rigger does not represent the same thing as hiring a certified rigger (although it is currently the best available course of action).

**Question #8:** I have co-workers/employees who have filled roles that should have been done by personnel holding currently existing industrial certifications or licenses. (Positions such as licensed electrician, certified welder, or licensed mechanical engineer. Please specify.)

This is a workplace safety question. Many theatre employees perform tasks that should be completed by licensed or certified professionals. Sometimes these tasks are legally restricted to certified personnel. This question should expose the frequency of that practice, and determine which positions are most often affected.

The expected results to this statement were for many people to volunteer that they had bypassed certified personnel due to the costs or time involved. Corresponding to the last question, a lower rate of incidence was expected from commercial theatre. In this case, a higher rate was expected from the not for profit theatres because of their
limited staffs and budgets, and from non-union personnel because of their typically smaller venues.

8. I have co-workers/employees who have filled roles that should have been done by personnel holding currently existing industrial certifications or licenses. (Positions such as licensed electrician, certified welder, or licensed mechanical engineer. Please specify.)

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<tr>
<th>Demographic Group</th>
<th>Average Response</th>
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<tr>
<td>Union</td>
<td>5.72</td>
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<tr>
<td>No Union</td>
<td>5.36</td>
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<tr>
<td>Hire</td>
<td>6.03</td>
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<td>No Hire</td>
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<tr>
<td>Comm.</td>
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<td>Edu.</td>
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<tr>
<td>Not Profit</td>
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<tr>
<td>No Degree</td>
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<td>Q1 No</td>
<td>5.29</td>
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<tr>
<td>Q1 Yes</td>
<td>5.88</td>
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The range of responses for this question was 1.60 points. The results did not precisely match expectations. Although commercial theatre companies tend to hire more certified personnel, apparently they also reserve some share of that work for uncertified personnel. The incidence of this behavior was relatively consistent among union and non-union workers. The types of jobs listed were mostly electrical, with some
professional certification and theatrical technical production

...engineering, and welding. Some respondents listed rigging. As stated above, there really is not an applicable rigging certification.

The comments support the idea that this type of behavior is occurring. They also suggest that there is a certain stubbornness to changing this behavior. Respondents like those who provided the second and third quotations could benefit from an electrician's license like the FE and LE licenses available to entertainment electricians in Canada.

The final comment suggests that there is at least some opinion that this type of behavior is not beneficial to our industry. Although not immediately cost effective, hiring certified personnel may have less immediate benefits.

**Question #9: I have witnessed life threatening behavior in the course of my job.**

This is another workplace safety question. The intent of this question was to determine the frequency of life threatening behavior during theatrical productions.

The expected response to this statement was that this type of behavior occurs regularly, and across the board.

![Question #9](image)

9. I have witnessed life threatening behavior in the course of my job.

1 2 3 4 5 6 7 8 9 N/A

Very Often Sometimes Never

“I won’t allow it. A theatre environment is dangerous but to the best of my ability I try to correct it.” (9)
“Mostly from poor rigging & construction techniques. The smaller the tour or shop the less training and less competence.” (5)

“Bravado, self life threatening.” (6)

“Happens all the time, everywhere I’ve worked. Bad ladders, hanging people out in the middle of nowhere, no guards on saws, cuts in extension cords.” (1)

The range of responses for this question was 1.63 points. The average responses fall within the sometimes range of the scale. While not suggesting that this type of thing occurs often, for this behavior even sometimes is disturbing. The responses did not express as high a frequency as the expected results. The exception to that was in the commercial category. A possible explanation for this might be because the commercial theatre technicians typically work on larger projects that have more inherent risks, or that they are more conservative in their safety evaluations.

The first quotation does remind us of the possibility that management is able to construct an environment in which this behavior is not tolerated. While many managers probably believe that they have created such a workplace, the responses to this question would seem to contradict them.

The remaining respondent statements give some of the reasons for this behavior. Smaller companies with lower budgets may tend to hire insufficiently sized crews, elect not to purchase correct safety equipment, not maintain tools, and be reluctant to discard equipment that still functions but is no longer safe for use. The idea that many theatrical employees choose to put themselves in these positions is worth noting. Management will probably continue to look the other way as long as employees continue to do the work without hesitation.

**Question #10: I trust employees’ & co-workers’ self evaluations of critical skills. (example: “Can you weld?”)**

This is a workplace safety question. Without a certification or license available to them, supervisors often have only the employees’ evaluation of their skills. This question asks for the level of confidence managers have in those evaluations.

The expected response was for all groups to average close together and in the Sometimes or towards the Never end of the range.
10. I trust employees’ & co-workers’ self evaluations of critical skills. (example: “Can you weld?”)

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“I’m honest and expect the people I work with to be also. I will always ask the question and tell them not to lie for safety’s sake. The big one being, ‘Are you afraid of heights?’” (2)

“One major problem now is the broad range of expectations from which people evaluate their own abilities. In other words, where one person may find competence, another may see grossly overestimated skill.” (6)

“I am ultimately responsible. I trust only demonstrated skills.” (9)

The range of responses for this question was 0.83 points. All the averages were near the middle of the range; this met expectations. The written responses present the hope that this type of evaluation would be honest and accurate. They also suggest a typical problem with these evaluations, that without a standard there really is not a basis for mutual understanding of skill level. The last comment gives the only definite procedure for using this type of self-reference: ignore it.

Questions 11-17 are at the heart of the competence issue. Currently, a theatre technician or technical designer can claim a limited number of qualifications. The available credentials include experience, educational degrees, and union membership. Managers evaluate experience using resumes and references. Previous questions
addressed these issues. This group of questions explores the credential value of school degrees and IATSE membership. The purpose of these questions was to ascertain the confidence of employers and co-workers in degrees and union membership.

The expected results for this group of questions were that the average responses would be at best no opinion, and probably be at the Strongly Disagree end of the evaluation scale. Moreover, the expectation was that the response from the particular group being evaluated would be much closer to the Strongly Agree end of the scale. For example, in the following question, when BFA graduates were asked to evaluate BFA programs, their answers were expected to be in greater agreement with the statement than responses from other demographics.

**Question #11: A BFA/BA technical degree ensures proficiency in scenic construction and installation.**

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<th>Demographic Group</th>
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<td>IA</td>
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<td>Q1 Yes</td>
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11. A BFA/BA technical degree ensures proficiency in scenic construction and installation.

```
1 2 3 4 5 6 7 8 9 N/A
Strongly Agree No Opinion Strongly Disagree
```

“Programs vary widely in their teaching ability. You must look at school & program before degree.” (9)

“It is just a piece of paper. Many people can go through the class work and never pick up a hammer.” (7)
“BFA more than BA. Have met many BA students who were incompetent.” (7)

The range of responses for this question was 1.74 points. The average response was well into the disagree end of the spectrum. The BA/BFA group did not believe they were more inherently qualified than did the group as a whole. The one unexpected result was the average response of the group without a college degree. This response persists through all the questions in this group. A possible explanation for this would be that since these respondents have had no exposure to the educational system they are hesitant to criticize it.

The comments are typical of the concerns of most respondents. In this case, the respondent identifies the differences between programs as a problem. There is also a suggestion that BFA programs are slightly more reliable than BA programs.

**Question #12: A BFA/BA technical degree ensures proficiency in technical design.**

This question continues the inquiry started above. This time the objective is technical design skill.

The expected results is this case were much the same as above, except possibly further toward the end of the scale.

![Question #12 Graph](image)

12. A BFA/BA technical degree ensures proficiency in technical design.

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“Hopefully this may be true, but in the professional level the exposure to many techniques may not have been experienced due to budget restraints.” (6)

“It should, and sometimes, maybe often does. But the level of proficiency is as much a product of the individual as the school. Just because the show opened does not make the process good.” (7)

“Met several people with minimal tech design skills straight out of school.” (9)

The range of responses for this question was 2.51 points. The width of the range is due to the respondents without college degrees. The results were much as expected, and had slipped closer to the disagree end of the scale than the last set of results.

The written responses call attention to the feeling that some schools, with smaller budgets, may not be able to give their students an exposure to as wide a range of technical design solutions as may be necessary for some production jobs. The second comment suggests that even a graduate of a good program may not have learned a good process.

**Question #13:** An MFA technical degree ensures proficiency in scenic construction and installation.

The next question continues the evaluation of educational programs related to more advanced degrees.

The expected results were in the same vein, perhaps with a little bit more confidence in MFA programs than in their BFA counterparts.
13. An MFA technical degree ensures proficiency in scenic construction and installation.

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“Better than BFA, but I doubt every production manager can construct and install scenery.” (5)

“Most MFA’s are very strong and complete and are all at least OK.” (4)

“I’ll say it once. A degree or a certificate and $1.00 will get you a cup of coffee.” (7)

The range of responses for this question was 1.95 points. Again, the no degree respondents were the farthest from the disagree end of the range. This time there was a more scattered distribution of responses within the range. Of particular note is the low level of confidence expressed by commercial theatre respondents. There is no immediate explanation for this, however it is probably a product of the other groups expressing a higher level of confidence rather than any change from the commercial group. The responses from the commercial group are similar through this entire group, placing no particular faith in any educational credential.

The quotations suggest that, although there is still a low level of confidence in this degree, that confidence level is still higher than that expressed for BFA’s.

**Question #14: An MFA technical degree ensures proficiency in technical design.**

This is another question continuing the evaluation of educational credentials.
The expected responses to this statement were still on the disagree end of the scale. However, the expectation was that this credential would fair the best out of any in this category.


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“Degrees are good indicators of skill, but a moron can always slip through - there are no absolute guarantees.” (4)

“Highly dependent on the program, many of which are artistically focused and therefore ill-equipped to train production personnel.” (8)

“Ensures? No way. Indicates, maybe. College theatre ain’t reality. Large budgets, good toys, fine shops, cheap labor. Very few non-profits can provide what a college can.” (9)

The range of responses for this question was 2.09 points. The overall average of 6.39 is the lowest disagreement in this group of questions. This is what was predicted. Although this statement is the most agreed with, the response is still on the disagree side of the scale. The commercial theatre response to this statement is more in line with the rest of the groups. This would suggest that if there is a perceived deficiency in MFA programs it is that they do not properly teach students build and installation tasks.

This group of quotations emphasizes the problems inherent in evaluating degrees offered by different schools. Schools with an artistic emphasis may be better
suited to train performers and designers than technicians. Also, programs with good tools, large budgets, comfortable production lead time, and new multi-million dollar facilities may not provide as strong a base as one might think.

**Question #15: IATSE membership ensures proficiency in scenic construction and installation.**

This question continues the credential evaluation by moving on to IATSE membership.

The expected responses were much the same as those described in question #11.

15. IATSE membership ensures proficiency in scenic construction and installation.

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“It doesn’t ensure it but 95% of the best builders I’ve worked with in theatre, film, Opera & Industrials have been IA.” (2)

“IATSE membership standards vary radically from local to local. You sometimes get firefighters or projectionists claiming rigging expertise.” (9)

“Some, preferably most, are skilled. But there are many that cause the jokes to have a ring of truth. All it really means is you are an IATSE member.” (9)

“I’ve had IATSE carpenters who couldn’t build scenery if their lives depended on it.” (9)
The range of responses for this question was 1.21 points. The results were very much as expected. The overall average was well into the disagree end of the spectrum, between the responses to BFA’s and MFA’s. This is the first time that the individual groupings displayed the anticipated results. IA respondents showed the most agreement of all labor groups. Also as the respondents’ level of education increased, their level of agreement with this statement decreased.

These are by no means the most colorful or descriptive comments provided by the respondents. Care was taken in this case to provide a balanced perspective. The quotations show that there is a genuine desire to believe that IA stagehands are competent. However, many respondents suggested rather forcefully that there were no guarantees. The problem of consistency of ability of IA members varying from local to local also came up repeatedly.

**Question #16: IATSE membership ensures proficiency in technical design.**

This is the last in the credential series.

The expected response to this statement is much the same as above. Since the IATSE is not a technical designer's union, this question was anticipated to have the highest disagree values of any statement in this group.

16. IATSE membership ensures proficiency in technical design.

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Strongly Agree | No Opinion | Strongly Disagree
“The IA does not teach technical design and they are not in the business to teach it.” (8)

“Technical design is usually in the realm of production personnel designated as ‘management’.” (8)

“IATSE members are builders, stagehands, and riggers. It isn’t their job to do technical design (although many of them know a lot more than many MFA/TD’s I’ve worked for and with.)” (5)

The range of responses for this question was 1.21 points. The average response was at the strongly disagree end of the scale, but the confidence of respondents in IA tech design was higher than in BA/BFA graduates (7.36 & 7.46 respectively). The response closest to the Strongly Disagree end of the scale came from MA/MFA graduates. This is probably due to their believing they are the most qualified for this type of work.

The comments defend the IATSE members saying that technical design jobs fall outside the expected range of the union’s membership.
From this question on, statements were to be treated as if they began with: “If the industry was to put a certification into practice ...”

**Question #17: I would expect more efficient use of materials from certified production personnel.**

This is a workplace efficiency question. The idea being tested is whether respondents would expect certified personnel to be less wasteful with materials.

The expected response to this statement was for a uniform middling reaction.

The range of responses for this question was 1.77 points. The responses, although almost in the middle of the range, are not as uniform as expected. The higher agreement response from the Q1 Yes group could suggest a reflexive response on their part, very much the way the Q1 No group had some reflex answers to earlier questions. Those people generally in favor of certification will of course expect more efficient...
behavior from those workers who obtain certification. The listed quotations express both of these types of responses.

**Question #18: I would expect more efficient use of time from certified production personnel.**

This is another workplace efficiency question. This question investigates expected time management skills.

The expected results were for unified agreement in the middle of the scale.

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<tr>
<th>Demographic Group</th>
<th>Average Response</th>
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<tbody>
<tr>
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<td>Edu.</td>
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<td>Not Profit</td>
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<td>MA/MFA</td>
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18. I would expect more efficient use of time from certified production personnel.

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“More time would be required on those projects in the design phase - perhaps construction times would be decreased.” (5)

“I think using time wisely is something you learn for yourself or not. It cannot be taught.” (7)

“This is a dangerous statement. IATSE personnel I have worked with have been lazy AND productive. Non-union -- same thing. I think this depends on the individual ‘work ethic’.” (5)

“Time use is often a function of shop and production organization and the technician has little control over this.” (8)
The range of responses for this question was 1.25 points. The distribution of responses was very similar to the last question. The numerically higher average response from IA members and commercial theatre respondents suggests that they feel that certification would not have a substantive impact on time management. In this case some respondents may have answered no opinion when they felt there would be little or no impact, although the response that would have correctly expressed that opinion would have been Strongly Disagree.

The first comment suggests that, although a certified shop worker might be able to speed up the construction or installation phase of a project, those gains might be illusory. The participation of certified personnel as technical designers might take up any time saved on the shop floor. The other two quotations characterize time management as either a skill that is inherent in a worker, or as a circumstance of project management on which the individual technician has little effect. In either of these cases, time efficiency would be likely unaffected by a certification program.

**Question #19: I would expect lower company insurance rates with use of certified production personnel.**

This question does not really fit into any of the three categories listed in the introduction of the survey results. The issue explored here is whether theatrical technicians believe that if there were a certification program in place producers and owners would be able to obtain lower cost company insurance rates. If this is true, it would be a compelling reason to pursue certification of the industry.

There was no expected result beyond a possible rash of N/A answers because technicians do not normally have to deal with insurance. Though there was no expectation of results, the responses of commercial theatre respondents were expected to be the most realistic. Shop owners are probably the only segment of those surveyed that routinely work with insurers directly.
19. I would expect lower company insurance rates with use of certified production personnel.

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“Depends on the position. A certified audio engineer will have less effect than a certified pyro technician.” (3)

“I don’t think most insurance companies know specifically the scope of theatrical work. If they did -- rates would be higher than they are.” (5)

“Yes, but not anytime soon. Insurance companies may be reluctant to view a new certification program as a risk reducing influence until time proves statistics to back that claim.” (3)

“Not unless/until it becomes an issue. Certainly if certified personnel were expected, your rates would increase if you didn’t have them.” (7)

“Insurance company does not evaluate your rate based on the numbers of certified welder.” (8)

The range of responses for this question was 1.55 points. The average responses were ambiguous and tightly grouped. The general response was an unqualified “it should”, without being able to firmly state that it would. The group with the least agreement was the commercial theatre respondents; as a group their average response was only barely on the disagree end of the scale. The commercial respondents and those not in favor of certification were the only groups on that end of the scale.

The comments betray the hopeful nature of some of the responses; that eventually certification would have a positive effect. The second quotation is probably
the most universal: that the industry would be much worse off, insurance wise, if insurers had a better idea of what kind of work happens on a regular basis. The notion that rates would go up for companies not using certified personnel when they were available has both positive and negative implications. On the plus side, the threat of higher rates would probably help to speed the transition toward using certified personnel. The negative implication is that small companies, where there might not be a real need for certified personnel, might face unnecessarily higher rates. Of course, the worst case would be for insurers to decide that some currently existing licenses or certification programs are appropriate. In that event, the rates might go up because theatre staffs are not composed of licensed engineers, licensed electricians, and certified welders. This double-edged sword is somewhat blunted by the last comment. The speaker in this case is a commercial shop manager. The statement suggests that certification programs have no role to play in figuring insurance rates.

**Question #20: I would expect generally less risky behavior with the use of certified production personnel.**

This is a workplace safety question. The aim here is to discover if the respondents believe that a certification program would help to counteract the type of behavior described in question #9.

The expected response to this question was an across the board agreement.
20. I would expect generally less risky behavior with the use of certified production personnel.

1 2 3 4 5 6 7 8 9 N/A

Strongly Agree  No Opinion  Strongly Disagree

“I would hope so. Some people seem to think that because it’s theatre that means sacrificing health & safety. I don’t agree with losing my health.” (1)

“Certification will not eliminate ‘cowboy’ behavior.” (4)

“If ‘risky’ is behavior in which people understand they are taking a risk I believe it is already quite low. If ‘risky’ is behavior in which people don’t understand that they are endangering themselves and others then I would expect it to decrease.” (7)

The range of responses for this question was 0.61. The responses matched the prediction. The only group to break from the norm was the Q1 No group, who inherently oppose certification.

The additional comments offered by respondents included the entire range of reactions. The thought, that while some risky behavior currently takes place because crew members are unaware that it is dangerous, and that such behavior would decrease under a certification program, is encouraging.

**Question #21: Technical production personnel in all departments should be certified.**

This is the first of the certification logistics questions. The intent of this question is to discover if the respondents believe that certification should extend to personnel in all technical departments.

The expectation was that respondents would find this idea ridiculous; that there would be those jobs that obviously did not require certification.
21. Technical production personnel in all departments should be certified.

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<th>Demographic Group</th>
<th>Average Response</th>
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<td>5.80</td>
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Strongly Agree | No Opinion | Strongly Disagree

“I feel that if a person is qualified to work then they should be allowed to work whether or not they have a certification.” (8)

“What about interns and such?” (8)

“I think there should be some breathing space, particularly in less safety-critical positions, to avoid the additional cost of paying certified persons.” (3)

“The level of commitment, training, and testing required for this would require a total restructuring of the arts funding & management in the USA.” (8)

The range of responses for this question was 1.48 points. The differences between each group’s responses are nondescript. The average was not as far to the disagree end of the scale as expected. The much higher disagreement from the Q1 No group should have been anticipated. Those not in favor of certification will certainly be against certifying everyone. It is worth noting that even those predisposed to support certification are marginally against this idea.

The quotations do express the thought that this is not an idea with much support. The first two comments identify the need to find ways for uncertified or uncertifiable workers to continue working. The last quotation addresses the practicality of expecting the current arts structure to support the costs of such a universal program.
It was strange that there were not more objections to the prospective certification of stitchers or audio technicians. Perhaps this reaction did not present itself because the question did not portray a certification program as a requirement.

**Question #22: Certification should be compulsory for all technical production personnel.**

This is another certification logistics question. The difference between this question and the last is the concept of a mandatory participation in a universal certification program.

Again, the responses were expected to be unified and negative.

22. Certification should be compulsory for all technical production personnel.

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“I think decision makers should be, not all personnel.” (4)

“I would be concerned about weakening the value/respect of a certification with a high percentage of personnel receiving a certification.” (7)

“What about experience? What about coming up through the ranks? Not everyone wants to be IA.” (9)

“2/3rds of the theatres in the country would go under because they couldn’t or wouldn’t pay the higher wage.” (N/A)
The range of responses for this question was 2.70 points. As predicted, the responses were fairly unified and negative. The atypical reaction towards agree from the No Degree respondents is somewhat curious. Perhaps they believe a mandatory certification program would help to put them on a more even footing with their more educated counterparts. The high level of IA disagreement to a program that would require them to have a certification to do a job they already have is consistent. The disagreement from the Not Profit respondents to a program that would probably further stretch their scarce resources is also consistent.

The respondent comments reflect the opposition to this concept. The first expresses the opinion that only managers and designers really require certification. The next quotation brings up the interesting point that if there is a required certification, and everyone has to have it, then there could be a reduction in overall utility. If the program were “dumbed down” to ensure that a significant number of people would not lose their jobs or be forced to retrain, this is a definite problem. The next comment is about how coming up the traditional way, “through the ranks,” requires protection in any system. There should not be a conflict here. Even without a certification system, coming up through the ranks should not enable workers to get jobs beyond their ability. The last is another respondent concerned with the overall cost of certification to the industry.

*Question #23: Certification should be compulsory for all technical production personnel in technical disciplines that have the potential to kill or maim.*

This is also a certification logistics question. It was intended to soften the position of the previous two questions.

The expected results to this inquiry were responses spread across the agree end of the scale. This not only appears to be a good idea, but is also more practical than certifying everyone. Those opposing certification were generally expected to retain that posture.
23. Certification should be compulsory for all technical production personnel in technical disciplines that have the potential to kill or maim.

<table>
<thead>
<tr>
<th>Demographic Group</th>
<th>Strongly Agree</th>
<th>No Opinion</th>
<th>Strongly Disagree</th>
</tr>
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<td>MA/MFA</td>
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</tr>
<tr>
<td>Q1 Yes</td>
<td>4.37</td>
<td>2.91</td>
<td>4.37</td>
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</table>

“*You’re more likely to be hit by a bus as hurt yourself mortally in the theatre.*” (9)

“What technical disciplines do not have the potential to maim or kill?” (N/A)

“*[Not] unless legal recourse falls on the certified person’s shoulders.*” (9)

“It should be something an employer can consider, and make a job requirement. But not across the board.” (7)

The range of responses for this question was 1.55 points. The responses were in the expected range. The limitation of positions appeared to make the certification more palatable to all the demographic groups. The separation between commercial, educational, and not profit respondents is very interesting. The idea is probably a desirable compromise to commercial respondents, but not profit respondents are probably still reluctant to agree to a probable increase in production budgets since they are less able to pass that cost along.

The first comment can probably be categorized as denial. The third comment is of particular interest. The respondent brings up the point that if legal responsibility does not sit squarely with the certified employee, then the certification holds little weight. The last comment suggests that while certification for all life-threatening
positions should be available as an option, the decision to hire a certified employee should be at the discretion of the employer.

**Question #24:** Certification should be limited to department heads, who would supervise and inspect the work of uncertified technical production personnel.

This is another certification logistics question. This is another possible compromise to a universal certification program. This would allow individual workers to remain uncertified, but still provide a greater level of confidence in the work by providing a certified department head.

The expected response to this question was a unified agreement along the same lines as the last question. Certainly there would be more agreement to this statement than to Question #21 or #22’s universal certifications.

24. Certification should be limited to department heads, who would supervise and inspect the work of uncertified technical production personnel.

<table>
<thead>
<tr>
<th>Demographic Group</th>
<th>Average Response</th>
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<tr>
<td>IA</td>
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</tr>
<tr>
<td>BA/BFA</td>
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<td>MA/MFA</td>
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</tr>
<tr>
<td>Q1 No</td>
<td>6.60</td>
</tr>
<tr>
<td>Q1 Yes</td>
<td>4.95</td>
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</table>

"Given the low pay of most production personnel is seems unreasonable to expect them to be more than basic labor. If you were to certify people it would have to be only supervisors." (3)
“Certainly if I would/could have certified staff I would prefer it if they were the department heads first.” (4)

“The certification should extend to everyone. What’s more dangerous a bad design or a bad weld?” (9)

“The certified people should be the ones doing the work.” (9)

The range of responses for this question was 1.00 point. The responses were unified, however they nearly all fall on the disagree side of the scale. The lone exception was the Q1 Yes group. A probable cause for the disagreement to this statement is expressed in the last two selected respondent comments.

The comments on this question again expressed the entire range of possibilities. The first two quotes state that this is probably a good compromise. The second two quotations express concern at moving the certification process away from the people doing the actual work. The respondents in the second group tend to be a bit more emphatic in their numerical response than those in the first group.

**Question #25: School programs, accredited by a board of theatre professionals, should be part of a theatrical technical production certification.**

This question continues the series of certification logistics questions. The intent was to gauge the respondents' feelings about accrediting drama school technical programs as part of a certification process.

Since this is the way many traditional and known programs tend to operate, the expected response to this question was uniform, conservative agreement, with two possible exceptions. The first possible exception was from IA members since many stagehands are not the product of drama schools. The second possible exception was from educators. The possibility existed that educators might view this type of accreditation as meddling.
25. School programs, accredited by a board of theatre professionals, should be part of a theatrical technical production certification.

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<th>Demographic Group</th>
<th>Average Response</th>
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<td>Q1 No</td>
<td>3.95</td>
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<tr>
<td>Q1 Yes</td>
<td>0.00</td>
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If you’re going to certify people you will need to train them for certification somehow; a school seems like a good idea.” (N/A)

“I would like to see standards stay with NAST and raise the current level to address this certification issue.” (8)

“Degree qualification should be separate from any certification process (as USA membership qualification is separate, usually, from MFA degree qualifications.” (2)

“Some of the best professionals never went to school!” (9)

The range of responses for this question was 1.74 points. The results were a lukewarm, unified agreement. The largest dissenting responses came not from the groups predicted above, but from those respondents with hiring responsibilities and from commercial theatre respondents. One explanation for this could be that those two groups do not want to see their pool of prospective employees shrink to include only those who went to college. Although the predicted exceptions did not come through in the numerical responses, they did show up in the comment section. One possible reason the IA group did not object more strenuously could be that many of the IA members within the responding sample did attend college.
The written comments express both polar viewpoints. The second quotation presents the educator’s objection: that curriculum is the responsibility of educators and that any change to accommodate a certification should go through an existing educational regulatory organization. The third comment suggests that although this is a good idea (based on the numerical answer), the certification process should remain separate from the educational process. The final comment presents the IATSE objection that many fully qualified technicians do not learn their craft at school.

**Question #26: Competency exams should be part of a theatrical technical production certification.**

This certification logistics question asks whether the respondents believe it would be necessary to test prospective certification candidates to verify their skill level.

This would seem to be a more universally palatable component of a certification program than school accreditation and attendance. The predicted results would show a unified agreement at a greater magnitude that the preceding question.

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26. Competency exams should be part of a theatrical technical production certification.

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“Would help to establish a base level for competence much like what the IA used to be.” (3)
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“Exams - not adequate method of testing true competency. Ability to assimilate, regurgitate material for high test score not accurate indication of true ability.” (7)

“They’re currently known as Apprentice/Journeyman exams in unions. Thesis projects in BFA/MFA programs.” (1)

“Sounds pretty subjective. Do you trust everyone who grades your papers?” (9)

The range of responses for this question was 1.31 points. The responses matched the predicted results. It is worth noting the strong agreement of IA, educational, and well-educated respondents.

As usual, comments were available on both sides of the issue. The second comment expresses an attitude that tests would not be sufficient on their own, that high test scores are simply a representation of how well the candidate takes tests. This goes hand in hand with the last comment that suggests that the development of a fair assessment might be very difficult.

**Question #27: Supervised internships should be part of a theatrical technical production certification.**

This is the last certification candidacy questions. The purpose of this question is to gauge how important the respondents feel supervised, professional experience would be to a certification process.

The expected result to this question was a unified agreement somewhere between the school accreditation and competency exams responses. Uniform value of professional experience was predicted.
27. Supervised internships should be part of a theatrical technical production certification.

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<tr>
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<tr>
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<tr>
<td>Strongly Disagree</td>
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“Internships are just a way for non-profits to get cheap labor.” (8)

“If certification is required. Internships should be in professional setting only.” (7)

“An internship may or may not as good a help as one may think. Because many MFA’s are given to people who do not deserve them. The same will be true for these internships.” (5)

“Internships are a great idea, but no one should be required to perform one if their skills and knowledge are adequate.” (3)

The range of responses for this question was 1.47 points. The responses were tightly grouped toward the agree end of the scale in the predicted range. The only atypical response was from the No Degree group. Since the members of this group simply went directly to work they may see little value to an internship process. Alternatively, they may feel that someone outside a school environment might not have access to this type of program, or be able to live on what it would likely pay.

The comments for this question reflect the disdain for the reluctantly accepted practice of abusing interns. The comments also express concern that if interns are really to gain experience that the internships must be in a professional setting. The final comment asserts that no one should be required to complete an internship if they already posses the necessary professional skills.
**Question #28: Certified technical production personnel should have to be periodically re-certified.**

This is a certification logistics question. Should certified technicians be required to periodically re-certify. This practice is common in other certification programs, but not universal.

The predicted results were a uniform agreement with the statement. This is based on a recognition within the field that materials and procedures do change over time, and that skills do atrophy over time.

```
28. Certified technical production personnel should have to be periodically re-certified.

   1    2    3    4    5    6    7    8    9    N/A
   Strongly Agree   No Opinion   Strongly Disagree

   “I believe there should be several layers of certification. The lower, more general levels would not need renewal. But the changes of tech over time require something.” (4)

   “Or have continued practical use in the form of jobs.” (3)

   “If you have to be certified you may as well stay up on current info and practices. I do anyway.” (1)

   “Technology changes -- people need to be brought up to date.” (3)

   “I'm not sure how economically feasible this is for our business.” (5)
```
The range of responses for this question was 1.45 points. The responses were close to the predicted values.

The comments accompanying these responses included a recognition of changing technology. There was concern that technicians who have been working steadily should not have to prove their competence, since their continued employment should be keeping them up to date. Also, the last comment speculates that the expense of periodic re-certification might be too heavy a penalty for traditionally low paid employees.

**Question #29: Theatrical technical production certifications should be administered by a board of theatre professionals.**

This is another certification logistics question. It explores the question of who should be responsible for governing a technical certification program.

Because of the real lack of alternatives to this statement, the expected result was general agreement. Any disagreement to this type of statement would probably involve the specifics -- which professionals?
29. Theatrical technical production certifications should be administered by a board of theatre professionals.

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<th>N/A</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>No Opinion</td>
<td>Strongly Disagree</td>
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“This would be the easiest and least costly road, although I have my doubts when we talk about the cost-conscious and relatively ignored world of theatre becoming self-governing. However, if an influential group responsible for monitoring working conditions such as Actor’s Equity were involved in both the establishment and administration of such a board, this could be a very effective route.” (2)

“and industrial professionals working along with theatre professionals.” (2)

“Again, who the heck are these ‘professionals’ and who are they to tell me how to do my job?” (N/A)

“Some of the required certifications would be best served by existing industry groups (i.e. welding, engineering, safety).” (3)

The range of responses for this question was 0.63 points. That represents the most unified response in the survey. The response was one of agreement, as predicted.

The quotations selected from this question’s responses address the composition of the governing group of professionals. The first expresses a feeling that the program would be more effective if some of the participants came from other theatrical groups that could bring a little power to the organization. The second reminds us that all levels of theatrical technicians need representation on any such panel. The last comment raises a much larger point that possibly some of the certifications would be better governed by their own professional associations, rather than theatre personnel working in those fields. Possibly the best solution would be a combination of the two.

**Question #30: Theatrical technical production certifications should be a state administered license.**

This is the last certification logistics question. It asks whether what we have been discussing should be governed by state governments.
The predicted result was that the respondents would reject this idea because it is too complicated, and would involve agencies that do not understand the theatre industry.

30. Theatrical technical production certifications should be a state administered license.

Strongly Agree No Opinion Strongly Disagree

“"The state has no idea what goes on inside a theatre."" (5)

“"Unless state agency uses theatre professionals on the licensing board."" (7)

“This could be the most effective route with regard to ensuring safety and professionalism. However, in order to be of interest to states and to have reasonable cost-efficiency, such a certification would probably need to encompass related production work such as industrials, conventions, civic events, and other situations that more directly create potential threats to a larger portion of the public. I also fear an overprotective or censoring government using such a licensing bureau as an inroad for gaining excessive influence over theatrical performance.” (3)

“These states where there isn’t a lot of action might have a harder time keeping programs for certification up & running. Maybe there should be key areas around the U.S. where certification can take place. Pacific, Mountain, Central & Eastern -- 3 or 4 ‘posts’ in each area.” (6)

“If it isn’t fed[eral] than you’ll have no more consistency then you have now as you go from local to local.” (9)
The range of responses for this question was 1.23 points. The respondents uniformly rejected this idea. The greatest disagreement came from the commercial theatre respondents.

The comments raise two issues. The first issue concerns special knowledge and national consistency. The respondents feel that state regulation is a bad idea because the state government does not know what theatre technicians do. One respondent suggests that a state licensing board composed of theatre professionals would address this problem. The respondents also reject this concept based on inevitable discrepancies between state programs, resulting in a system with the same local to local problems that currently exist. Other certifications have formed national boards to minimize differences between state licenses.

The second issue raised is one of censorship. The respondent suggests that in the current political climate, the theatre industry should not voluntarily introduce a governmental agency into its daily operation.
Conclusion

The practice of professional certification is extremely broad. Programs exist for a mind boggling number of specialties. Most of the programs appear to be well-conceived efforts to better their industries. With the detailed plans summarized in this thesis, it is easy to believe that these certification programs help the industries and the technicians they affect. It would appear that there are many programs currently operating that could be adopted by theatre professionals.

The theatrical licensing and certification programs discussed from other countries highlight the fact that this is a real issue. The programs run quite a spectrum. The Canadian program is extremely narrow. It provides just enough to allow technicians to come into compliance without dictating anything else to the profession. On the other hand, the English program very specifically delineates many positions. This program could eventually impact on every theatre technician working in Britain. These two programs also originated from very different sources. The Canadian program was created by the government, only bringing in industry ideas very late in the process. The English program is a product of the industry itself. Having seen that both of these evolutions are possible, technicians in the United States would do well to consider how they would like to see a potential program develop. Both of these foreign programs are still very young. The theatre industry in this country has much to gain by observing how they have developed.

The theatre industry response to the concept of certification was surprising. A 72% positive response to the idea of a theatrical technical certification is encouraging. This would suggest that technicians are concerned about the level of competence of the people working in the field. However, it is important to remember that a positive response to the general idea is not the same as an approval of a specific certification.

The response from the Actor’s Equity Association was encouraging, as far as Broadway is concerned. Their general satisfaction with the New York stagehands and scene shops was a nice discovery. The AEA’s concern over the quality of technicians at smaller institutions is one that is echoed by other professionals. Their suggestion of instituting an Equity contract freeze to pay for better technicians is one that should be studied with or without a certification program. However, one can not help thinking
that, if technical competence was an important issue to Equity, they have the means to address it within the scope of their current contracts, without the help of technicians. The general statement, that they wish theatre producers would simply attempt to mount shows that are technically within their means may be the single best approach to this problem. Whether your technicians are fabulous or not, there is an operating level of competence at which one can be comfortable. It is not the highest level they might reach, but rather one with which you can confidently charge them. That level should determine the scope of production. If the producers want to do bigger shows, they must be made to understand that they need to put up more money. Certification or not, that fact does not change.

The IATSE’s embracing of the certification idea is also encouraging. Opposition to a certification from the IA would almost certainly doom it to failure or insignificance. Any program developed will require the participation and the support of the IA. On the other hand, it seems that the IATSE locals were really concerned about their average level of competence, they have the means and the administration to address the problem now, simply by adding a competency requirement for continued membership.

The commercial theatre respondents seem to have the voice of reason. Their embracing of the use of certified personnel while opposing any theatre specific certification seems sound. In that way, they are guaranteed there would be no dumbing down of programs to allow the typical theatre technicians to participate. However, if they are going to take this position they must follow through. They have the means to hire certified personnel; they also have the responsibility to do so. Many survey responses indicated, even from those in the commercial theatre, unlicensed personnel were filling roles more appropriately filled by licensed technicians. If this is their desired solution, it must be a solution they do not desire too much.

The survey responses painted a rather gloomy picture. They said that unqualified technicians were being hired, and that resumes and recommendations were not a reliable source of competency information. Mostly these responses seemed to indicate that managers are aware of the problems and are doing their best.

The responses seem to suggest that there is little or no faith in educational degrees or union affiliation to guarantee a level of competence. This would appear to be
true for building skills, and be even worse for technical design skills. People even rated their own degrees and affiliations poorly.

Respondents indicated that uncertified personnel filled roles more often than certified personnel when certified persons could have been used, and in some cases were legally required. Each of the respondents who said they “did their own power ties and were perfectly competent to do so” should refer to their state code. It probably reads very much like the Connecticut State Code which states that you not only need to be competent, you must also have a license. In fact each time these respondents took this action (if they were in Connecticut) they exposed themselves to a $100 fine. The apparatus exists for the negotiation of limited licenses for many trades. Perhaps it would serve the American entertainment industry to develop a license like the Canadian FE and LE, and submit it to state boards for consideration.

The answers to the logistics and impact questions seemed to indicate that the respondents believed that a certification could help the industry. However, many also seemed to believe that the dollar cost would be too much to bear. There was no real agreement over the necessary scope of any proposed program. Generally, respondents suggested that a certification from an industry board would be preferable to one administered by the government.

It would seem that the best way to proceed would be to follow the commercial theatre example; to use certified personnel when industrial programs are available. This would also require theatrical technicians working in those areas to become certified. Producers and managers then have the responsibility to hire certified technicians. There is one significant flaw to this approach. There is no existing certification for rigging. A survey of rigging professionals yielded only one related license. This program regulates the personnel who may hang large outdoor displays in New York City. Hanging the same display indoors would fall outside the license’s jurisdiction. Although a Professional Engineer would be the correct person to design a rigging solution this does not address the installation process. With all due respect to Mr. Paulson’s objection, this appears to be the one deficient area. If as an industry we really do care about the competence issue, this seems like a good place to start.
Appendix A: Survey Form

The following pages contain the cover letter, instructions, and survey forms that were sent out to respondents.
Professional Certification
& Theatrical Technical Production
Appendix B: Survey Respondent Sample Makeup

This appendix briefly presents a demographic breakdown of the respondents to the Theatrical Technical Certification Survey. The overall response rate was 64%. Survey participants were selected from names submitted by Yale School of Drama students. Participants were not contacted in advance of receiving the survey, and no attempt was made to follow up with those who chose not to respond. The groups used for comparative analysis were: IATSE member, union member, non-union, hire employees, do not hire employees, commercial theatre, educational theatre, not for profit theatre, no college degree, BA/BFA graduate, and MA/MFA graduate. Other demographic groups provided in this section include: USITT member, non USITT member, Yale School of Drama Alumni, and non Yale School of Drama Alumni.

Union Affiliation:

“IATSE members” are IA members in any local. Many respondents listing IA membership listed multiple locals. Some respondents also listed television or film locals along with theatre locals. Many respondents held management jobs atypical of IA members.

“Union Member” means member of any union. Those categorized under "yes" were members of theatrical unions, or of other unions that had jurisdiction over their current theatre jobs. Unions represented in this group include: The United Scenic Artists (USA), Actor’s Equity Association (AEA), The Teamsters, and at least three different University Employees’ Unions.
**Hiring Responsibilities:**

Those respondents listed under “yes” to this category have the hiring of theatrical production employees as a regular part of their current job.

**Level of Production:**

This category divided the respondents by their producing organizations. “Educational” respondents work in college theatre programs at either the graduate or undergraduate level. “Commercial” respondents work for scene shops, touring companies, union offices, or production companies. Respondents classified as “Not for Profit” work in LORT theaters, or in smaller theatre venues such as summer stocks.

**Educational level:**

This category divides the respondents by the highest level of education they have completed. “No Degree” respondents may have some college, but hold no degree. “BA/BFA” and “MA/MFA” respondents have finished either of those programs. Their degrees are not necessarily from theatre programs.
**USITT Membership:**

Respondents classified under “yes” in this category are current members of the United States Institute of Theatre Technology.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>63%</td>
<td>37%</td>
</tr>
</tbody>
</table>

**Yale School of Drama:**

Respondents classified under “yes” in this category are either currently students or past students of the Technical Design and Production program at The Yale School of Drama.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>25%</td>
<td>75%</td>
</tr>
</tbody>
</table>
Appendix C: Raw Survey Results

The table on the next page contains all the data used for the graphs in the survey response section. The question numbers are on the left, demographic groups are listed across the top. The average numerical response to each question is listed in the body of the table.
Appendix D: Directory of Selected Certification Programs

The following is a directory of selected certification programs currently available in the United States. Most of the listed programs are for people working in engineering, and industry. The bulk of the listings come from The Guide to National Professional Certification Programs by Phillip Barnhart. The full list of programs in this book covers more than fifteen pages, listing over 500 certification programs. The listed programs break down like this: 181 business & management, 39 insurance & personal finance, 62 real estate and property, 36 hospitality and travel, 88 engineering and science, 47 trade and technical, and 92 health and fitness.

Some of the programs were listed in A Benchmarking Study to Identify and Analyze Professional Certification Programs in Industry and Engineering by Tracy S. Tillman. Certification programs from Dr. Tillman’s thesis are listed in italics. Programs with possible applications in theatrical technical production are listed in bold.

The purpose of presenting this table is to begin to demonstrate the wide variety of certification programs already operating. The programs listed here all effect people doing either the same type of work done by theatre managers and technicians, or different work which is done in a similar manner. For a true picture of the actual size of the certification industry see Mr. Barnhart’s book.

<table>
<thead>
<tr>
<th>Certifying Organization</th>
<th>Certification</th>
</tr>
</thead>
</table>
| AACE International | CCC - Certified Cost Consultant  
| | CCE - Certified Cost Engineer  
| abcd The Microcomputer Industry Association | A+ Service Technician Certification  
| Agricultural & Industrial Manufacturers Representative Association (AIMRA) | CPFB - Certified Professional Manufacturers Representative  
| Air and Waste Management Association | QEP - Qualified Environmental Professional  
| American Board of Industrial Hygiene | OHST - Certified Occupational Health and Safety Technologist  
| American Compensation Association (ACA) | CBP - Certified Benefits Professional  
| | CCP - Certified Compensation Professional  
| American Concrete Institute (ACI) | ACI Certification  
| American Design Drafting Association (ADDA) | Certified Drafter  
| American Electroplaters and Surface Finishers Society (AESF) | CEF - Certified Electroplater - Finisher  
| | ESC - Electronics Specialist, Certified  
| American Industrial Hygiene Association (AIHA) | ASP - Associate Safety Professional  
| | CSP - Certified Safety Professional  
| American Institute of Constructors (AIC) | CPC - Certified Professional Constructor  
| American Institute of Motion Engineers (AIME) | CMCS-SA - Certified Motion Control Specialist: Systems Applications  

147
<table>
<thead>
<tr>
<th>Organization Name</th>
<th>Certification(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Institute of Plant Engineers (AIPE)</td>
<td>CPE - Certified Plant Engineer</td>
</tr>
<tr>
<td>American Lighting Association (ALA)</td>
<td>CPF</td>
</tr>
<tr>
<td>American Payroll Association (APA)</td>
<td>CPP - Certified Payroll Professional</td>
</tr>
<tr>
<td>American Planning Association (APA)</td>
<td>AICP - Certified Planner</td>
</tr>
<tr>
<td>American Purchasing Society, Inc. (APS)</td>
<td>CPE - Certified Purchasing Executive</td>
</tr>
<tr>
<td>American Society of Interior Designers (ASID)</td>
<td>NCIDQ Certified - Certified Interior Designer</td>
</tr>
<tr>
<td>American Society of Professional Estimators (ASPE)</td>
<td>CPE - Certified Professional Estimator</td>
</tr>
<tr>
<td>American Welding Society (AWS)</td>
<td>AWS Certified Welder</td>
</tr>
<tr>
<td>Association for Computing Machinery</td>
<td>ACP - Associate Computer Professional</td>
</tr>
<tr>
<td>Electronics Technicians Association, International (ETA)</td>
<td>CET - Certified Electronics Technician</td>
</tr>
<tr>
<td>Expediting Management Association, Inc. (EMA)</td>
<td>C.E.M. - Certified Expediting Manager</td>
</tr>
<tr>
<td>Fire Protection Specialist Certification Board</td>
<td>CFPS - Certified Fire Protection Specialist</td>
</tr>
<tr>
<td>Fluid Power Society</td>
<td>Certified Fluid Power Mechanic</td>
</tr>
<tr>
<td>Human Resource Certification Institute (HRCI)</td>
<td>PHR - Professional in Human Resources</td>
</tr>
<tr>
<td>Institute of Certified Professional Managers (ICPM)</td>
<td>CM - Certified Manager</td>
</tr>
<tr>
<td>Institute of Hazardous Materials Management</td>
<td>CHMM - Certified Hazardous Materials Manager</td>
</tr>
<tr>
<td>Institute of Industrial Engineers (IIE)</td>
<td>CSI - Certified Systems Integrator</td>
</tr>
<tr>
<td>Institute of Noise Control Engineers (INCE)</td>
<td>INCE Board Certification</td>
</tr>
<tr>
<td>Instrument Society of America (ISA)</td>
<td>CSAT - Certified Specialist in Analytical Technology</td>
</tr>
<tr>
<td>International Association of Knowledge Engineers (IAKE)</td>
<td>CKE - Certified Knowledge Engineer</td>
</tr>
<tr>
<td>International Association of Lighting Management Companies (NALMCO)</td>
<td>CLMC - Certified Lighting Management Consultant</td>
</tr>
<tr>
<td>International Association of Plumbing and Mechanical Officials (IAPMO)</td>
<td>Certified Plumbing Inspector</td>
</tr>
<tr>
<td>International Conference of Building Officials (ICBO)</td>
<td>Certified Combination Building Inspector</td>
</tr>
<tr>
<td>International Exhibitors Association (IEA)</td>
<td>CME - Certified Manager of Exhibits</td>
</tr>
<tr>
<td>International Facilities Management Association (IFMA)</td>
<td>CFM - Certified Facilities Manager</td>
</tr>
<tr>
<td>Materials Handling and Management Society (MHMS)</td>
<td>PCMH - Professional Certified in Materials Handling</td>
</tr>
</tbody>
</table>

*CMCS-SD - Certified Motion Control Specialist: Systems Design*

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148

Professional Certification & Theatrical Technical Production
<table>
<thead>
<tr>
<th>Professional Certification &amp; Theatrical Technical Production</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Organization</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Association of Business and Educational Radio (NABER)</td>
<td>NABER Certified Technician</td>
</tr>
<tr>
<td>National Association of Industrial Technology (NAIT)</td>
<td>CMT - Certified Management Technician</td>
</tr>
<tr>
<td>National Association of Purchasing Managers (NAPM)</td>
<td>C.P.M. - Certified Purchasing Manager</td>
</tr>
<tr>
<td>National Association of Radio and Telecommunications Engineers, Inc. (NARTE)</td>
<td>NCE - NARTE Certified Engineer, NCT - NARTE Certified Technician</td>
</tr>
<tr>
<td>National Association of Service Managers (NASM)</td>
<td>CSE - Certified Service Executive, LCSE - Lifetime Certified Service Executive, ASE - Associate Service Executive</td>
</tr>
<tr>
<td>National Certification Commission in Chemistry and Chemical Engineering (NCCCEC)</td>
<td>CChE - Certified Professional Chemical Engineer, CPC - Certified Professional Chemist</td>
</tr>
<tr>
<td>National Contract Management Association (NCMA)</td>
<td>CPCM - Certified Professional Contracts Manager</td>
</tr>
<tr>
<td>National Coordinating Council on Emergency Management (NCCEM)</td>
<td>CEM - Certified Emergency Manager</td>
</tr>
<tr>
<td>National Council of Architectural Registration Boards (NCARB)</td>
<td>NCARB Certificate</td>
</tr>
<tr>
<td>National Executive Housekeepers Association (NEHA)</td>
<td>C.E.H. - Certified Executive Housekeeper, R.E.H. - Registered Executive Housekeeper</td>
</tr>
<tr>
<td>National Institute for Certification in Engineering Technologies (NICET)</td>
<td>CET - Certified Engineering Technician, CT - Certified Engineering Technician</td>
</tr>
<tr>
<td>National Institute of Automotive Service Excellence (ASE)</td>
<td>ASE Certified Technician</td>
</tr>
<tr>
<td>National Recreation and Park Association (NRPA)</td>
<td>CLA - Certified Leisure Associate, CLP - Certified Leisure Professional</td>
</tr>
<tr>
<td>Professional Association of Resume Writers (PARW)</td>
<td>CPRW - Certified Professional Resume Writer</td>
</tr>
<tr>
<td>Professional Photographers of America, Inc. (PP of A)</td>
<td>CEI - Certified Electronic Image, CPP - Certified Professional Photographer</td>
</tr>
<tr>
<td>Professional Picture Framers Association (PPFA)</td>
<td>CPF - Certified Picture Framer</td>
</tr>
<tr>
<td><strong>Project Management Institute (PMI)</strong></td>
<td>PMP - Project Management Professional</td>
</tr>
<tr>
<td>Roof Consultants Institute (RCI)</td>
<td>RRC - Registered Roof Consultant, RRO - Registered Roof Observer</td>
</tr>
<tr>
<td>Society of American Value Engineers (SAVE)</td>
<td>AVS - Associate Value Specialist, VMP - Value Methodology Practitioner, CVS - Certified Value Specialist</td>
</tr>
<tr>
<td>Society of Architectural Administrators, The (SAA)</td>
<td>CAA - Certified Architectural Administrator</td>
</tr>
<tr>
<td>Society of Broadcast Engineers, Inc. (SBE)</td>
<td>Certified Broadcast Technologist, Certified Broadcast Engineer</td>
</tr>
<tr>
<td>Society of Cable Television Engineers (SCTE)</td>
<td>BCE - Broadband Communications Engineer, BCT - Broadband Communications Technician, Broadband Installer Certification</td>
</tr>
<tr>
<td>Society of Cleaning Technicians</td>
<td>Certified Inspection, Cleaning and Restoration Technicians</td>
</tr>
<tr>
<td>Society of Cost Estimating and Analysis (SCEA)</td>
<td>CCEA - Certified Cost Estimator/Analyst</td>
</tr>
</tbody>
</table>
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