



PEARL Technician Certification Program

Candidate Handbook

PEARL Electrical Equipment Reconditioning Technician Level I

This booklet contains:

- The subject matter for the PEARL Technician Certification Exam
- Exam education and experience requirements
- Selected study references
- Certification policies
- Sample exam questions

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PEARL Technician Certification Candidate Handbook

Introduction

The PEARL Association

The Professional Electrical Apparatus Recyclers League (PEARL) is a professional trade association of companies that supply reconditioned, and remanufactured electrical power equipment, apparatus, and components to industry. The mission of PEARL is to create a marketable distinction in quality, safety, and integrity for PEARL members in the eyes of their customers. PEARL's members must meet strict technical, safety, and operational requirements; and be committed to the safe reconditioning and remanufacturing of electrical apparatus and equipment that has previously been in service. PEARL sponsors an annual Electrical Safety, Reliability, and Sustainability Conference & Exhibition, which can be attended by anyone concerned with the safety and reliability of reconditioned, remanufactured, and recycled electrical equipment and apparatus.

Why Get Certified?

For the employer, PEARL Technical Certification provides a way to distinguish companies with certified technicians on staff, giving these companies a marketable edge and elevated status within the industry. Certifying your technicians will improve employee morale and reduce turnover, provide a feeder path for future management positions, reduce accidents and associated costs, reduce warranty claims, and improve the company's bottom line.

For the technician, PEARL Technical Certification can extend your career path, opening up new opportunities within your organization; give you a greater sense of professional fulfillment and gain you the respect of your peers – both at work and in the electrical reconditioning community at large.

An important part of this program depends on PEARL, its corporate membership and their employees to educate the customer base on the safety and financial benefits of using companies with PEARL-certified technicians (e.g. improved reliability, reduced downtime losses, and increased employee safety). To this end, PEARL will launch a public relations (PR) campaign and include PEARL Technician Certification logos and badges in advertisements to increase public awareness. Companies with certified technicians also will have the right to post PEARL Technician Certification badges on their websites as well as PR and marketing materials. Thus, technician certification is a critical step toward helping PEARL members provide the industry with a marketable distinction in quality, safety, and integrity of reconditioned and remanufactured electrical equipment.

Delineation of Certification Levels

The PEARL Technician Certification program was created to offer multilevel technical certification for individuals employed in the reconditioned electrical equipment field. Exams are designed by vocational specialists through four levels of practice, ranging from the entry level technician (Level I) to the supervisory technician (Level IV). Levels II, III, and IV are defined in terms of general experience in the electrical equipment reconditioning business and the complexity of the equipment they perform work on. The certification design committee developed a general delineation of the levels of certification that are presented below.

Level I

Level I technicians can work safely in a shop environment and around de-energized electrical power equipment, recognize and have basic understanding of the PEARL reconditioning standards; and

are able to identify various types of electrical apparatus, shop equipment, warehouse equipment, test and measurement equipment, and cleaning equipment used in the electrical equipment reconditioning process under the supervision of a higher-level technician. ¹

Level II

Level II technicians can work independently; and inspect, test, and perform reconditioning procedures, following PEARL and other industry standards, on a wide range of electrical power equipment, and accurately interpret equipment drawings, specifications, and electrical schematics, at the component level, as it relates to the PEARL reconditioning standards.

Level III

Level III technicians can supervise Level I and II technicians; conduct and oversee large equipment reconditioning projects; are able to work safely in the field around energized electrical equipment; develop equipment test plans and analyze test results; plan and lead jobs; evaluate shop safety plans; and provide training to others.

Level IV

Level IV technicians can manage multiple individuals and projects; conduct complex metering and protection projects; make recommendations on power system diagnostic testing and corrective action; and evaluate electrical equipment modifications and upgrades for adherence to PEARL and industry standards.

PEARL Technician Profile

This certification program is intended for technicians who are engaged in inspection, reconditioning, and/or remanufacturing, testing, periodic maintenance of electrical power equipment and evaluation of such equipment for acceptance for service, continued serviceability, or required maintenance.

The Certification Process

Step One – Complete the Online Technician Application

To become certified, ***all applicants*** must complete an online certification application. The application confirms an applicant's work and experience qualifications. PEARL certification requires that all applicants must be currently employed by a PEARL Full Dealer, Full Service, or Satellite Member Organization. Applicants also must meet all the education, training, and work experience requirements as set forth in the PEARL Technician Profile. *All applicants are required to pay in advance for the PEARL Technician Certification exam to offset the costs of application review, exam creation, and delivery.* If an applicant's application is denied by PEARL, PEARL will issue a full refund, less a \$75 administration fee, within 4 weeks following the application review date.

Step Two – Application Review

Upon payment and submission of your application, your confirmation email will provide you with information on how your supervisor may verify the education/training, work experience, and employment information given on the application. This information must be verified within 30 days of your application submission. If the application is approved, then the applicant will receive an email acceptance and enrollment letter. If the application is rejected, the applicant will be notified by email and may be asked to supply more information if warranted.

Step Three – Exam Scheduling

Once an applicant has received an acceptance letter through email they may schedule their exam. All exams are delivered online using a Web browser and are proctored at an authorized managed test center. The enrollment email will provide the applicant all the instructions needed to take their exam. Exam candidates are required to show at least one valid government-issued photo identification (state driver's license or ID, or passport). Only after positive identification has been made by the exam proctor may a candidate begin the exam.

To reschedule your exam, you must submit a written request by email to the proctor agency no later than one week before your scheduled exam requesting another time. If you miss your scheduled exam time, then you may reschedule your exam after paying an additional \$50 administrative fee. An exam may only be rescheduled two times before all exam fees are forfeited and a new application must be resubmitted.

To cancel your exam, you must submit a signed written request (a letter stating you wish to cancel your application) to PEARL. The written request must be received before you schedule an exam time. Full refunds, less a \$75 administrative fee, will be made within four weeks after the scheduled date.

To re-schedule an exam after failing. If you fail to pass the exam during your first sitting you may reschedule after a 30 day waiting period. A new application and exam fee is required before rescheduling your next exam.

Step Four – Taking the Exam and Preliminary Results

PEARL exams are administered online, using a third party, online proctor. During the exam, the candidate will use their own computer, which must have a functioning microphone and camera. The proctoring agency will lock down the users' browser and maintain video contact throughout the exam to insure a secure exam environment. No reference materials, cell phone, cameras or computers (other than the computer being used for examination) are allowed during the exam. Candidates are not allowed to use any notes during the exam. Candidates who violate exam rules will be disqualified from that exam. All violations of exam security will be investigated by PEARL and appropriate action will be taken.

EXAM GRADING

After participants have completed all the questions, the exam automatically scores, tabulates, and stores the answers in a secure PEARL database. The overall exam score will determine if you pass or fail the exam. The minimum passing score is 70% of items answered correctly. Each time a certification exam is given, the questions are changed, resulting in a different exam. The passing score is developed as an overall estimate of minimal acceptable competence in the Exam Content Areas by subject matter and examination experts. Passing scores are determined by an overall passing score, not by performance on individual Exam Subject Areas, and are independent of other candidates' scores. Partial credit *will not* be awarded for any exam item answered incorrectly. After completing the test, applicants are notified immediately if they have passed or failed the exam.

Step Five – Official Exam Notification

Exam results are displayed on the computer screen upon completion of the exam as well as emailed to the candidate. No results are given by phone, fax, or email. All results are confidential and are only released to the certificate candidate. The official exam notification will only indicate if the applicant passed or failed the exam. For exam security, no additional feedback will be provided to candidates about specific exam item answers.

Step Six – PEARL Certification

All certificates are emailed with the exam notification email, as well as stored in the applicants transcript profile on the PEARL online management system.

All certifications expire three years after an individual's initial certification is awarded and every third year after renewal. Certification renewal will be based on the certificant's activities during that three-year period. Requirements and fees may be found in PEARL's Continuing Professional Development Policy.

Exam Design and Administration

Exam Design

All certification exams are designed to test knowledge and skills required to perform *essential duties* with minimal acceptable competence. All research was conducted under the guidance of the Technical Certification Program Committee and PEARL staff. All test questions are designed to measure at least one area of knowledge or skill that is required to perform an essential task.

Exam Format

All PEARL exams are given in a test format utilizing a variety of exam question types. The following are question formats used in the exam: multiple choice, multiple response, matching, hotspot, and ranking formats. Questions may have one, two or three correct answers. The exam does not utilize essay, true/false, or yes/no questions (see Sample Test Questions in this booklet for an example). These objective formats allow for a greater coverage in content for a given amount of testing time and improve competency measurement reliability.

Complexity of Test Questions

At Level II, certificate candidates are expected to have basic knowledge of the job and the ability to safely perform the Essential Duties. Examinees will have to answer questions that test knowledge, comprehension, and application of the subject matter. The complexity of the questions will range from basic recall of previously learned material and the ability to understand the meaning of the subject matter to being able to apply knowledge to new situations.

Exam Content Areas (ECAs)

Exam Content Areas (ECAs) contain a Knowledge or Skill that is required to perform the Essential Duties for that specific Level. All of the Exam Content Areas contain important Knowledge and Skills required when performing the Essential Duties of an electrical equipment reconditioning technician. However, the test designers felt that some content areas were of higher importance, thus, not all of the content areas are equally weighted on the exam.

Item Appeals

Candidates who wish to appeal a specific exam item must do so during the exam by completing the Candidate Feedback Review Screen during the exam period. Candidate feedback will be evaluated, and appropriate adjustments will be made to the exam content. Candidates submitting feedback will not be contacted.

Hierarchical Levels

At the entry level is PEARL technician Level I. This entry level certification is designed to measure competence as a general reconditioning and remanufacturing technician worker. A Level I technician is expected to be able to assist either low-voltage electrical specialists performing fundamental duties. Certificate candidates should be familiar with the basic mechanical and electrical principles and duties listed in the Level I PEARL Technician section of this handbook.

The PEARL Level II technician is a Skilled/Journey level certification designed to measure competence at a Skilled or Journey level for more complex reconditioning tasks. Level II technicians are expected to be able to work independently on either low-voltage electrical equipment performing comprehensive duties. Certificate candidates should be familiar with the basic mechanical and electrical principles and duties listed in the Level II PEARL Technician section of this handbook.

Certification at Level III is designed for lead or advanced personnel involved with supervisory and training responsibilities. Candidates must demonstrate high competency in low-voltage electrical and Medium-Voltage Electrical equipment. Certificate-holders at this level are expected to demonstrate a wide range of knowledge and skills and be able to perform the essential duties within multiple areas of low-voltage electrical and Medium-Voltage Electrical equipment. **(This level is currently under development.)**

Level IV certification is designed for managerial-level personnel involved with equipment reconditioning and remanufacturing at either the low-voltage electrical areas. Certified individuals at this level are expected to demonstrate competency as managers of PEARL member operations. Qualified candidates should be able to demonstrate the managerial functions as outlined in the *Level IV* low-voltage electrical sections of this handbook as well as the ability to understand and make managerial level decisions on low-voltage electrical equipment and technology issues. **(This level is currently under development.)**

Code of Ethics

The purpose of the Code of Ethics is to ensure industry confidence in the integrity and service of PEARL member companies while performing their duties. Additionally, it is intended to reflect the standards and behavior that PEARL certificate-holders and applicants expect of each other as they perform their work meeting strict technical, safety, and operational requirements that reaffirm the value of holding a PEARL technical certificate. PEARL-certified technicians recognize the services they render have a significant impact on the clients and industry they serve. As they perform their duties, PEARL technical certificate-holders and applicants are expected to meet the following standards of professional conduct and ethics:

1. To protect themselves, their coworkers, property, and the environment by performing the Essential Duties of the PEARL-certified vocation safely and effectively, and complying with all applicable federal, state, and local regulations.
2. To represent themselves truthfully and honestly when performing their duties and throughout the entire certification process.
3. Undertake only those assignments for which they are competent by way of their education, training, and experience.
4. To adhere to all examination rules and make no attempt to complete the exam dishonestly or to assist any other person in doing so.
5. To refrain from activities that may jeopardize the integrity of the PEARL Technical Certification program.
6. Have due regard for the physical environment and for public safety, health, and well being. If their judgment is overruled under circumstances where the safety, health, property, or welfare of the public may be endangered, they shall notify their employer, client, and such other authority as may be appropriate. An employee shall initially express those concerns to the employer.
7. Admit and accept their own errors when proven wrong and never distort nor alter the facts in an attempt to justify their decisions.
8. Avoid conflicts of interest whenever possible. When unavoidable, they shall disclose to their employer or client, in writing, any action that might create the appearance of a conflict of interest.
9. Avoid receiving and granting bribery in all its forms.
10. Strive to maintain their proficiency by updating their technical knowledge and skills within the industry.
11. Not reveal facts, data, or information obtained in connection with services rendered without prior consent of the client or employer except as authorized by law.

Applicant Ethics Representation and Agreements

PEARL certification is a professional certification designed to distinguish those technicians that have the knowledge, skills and experience required to perform the reconditioning work of our industry from those who do not. It also recognizes those companies within the industry that strive to create an environment

and provide services that create a marketable distinction in quality, safety, and integrity for PEARL members in the eyes of their customers. Within the application a series of 5 Representation and Agreement questions are asked of the applicant to help determine if the applicant is within the ethical standards desired by PEARL. If the applicant does not answer or answers no to any of these questions, they will be disqualified from certification or must provide PEARL with a letter of explanation concerning the representation in question.

Level I PEARL-Certified Technician

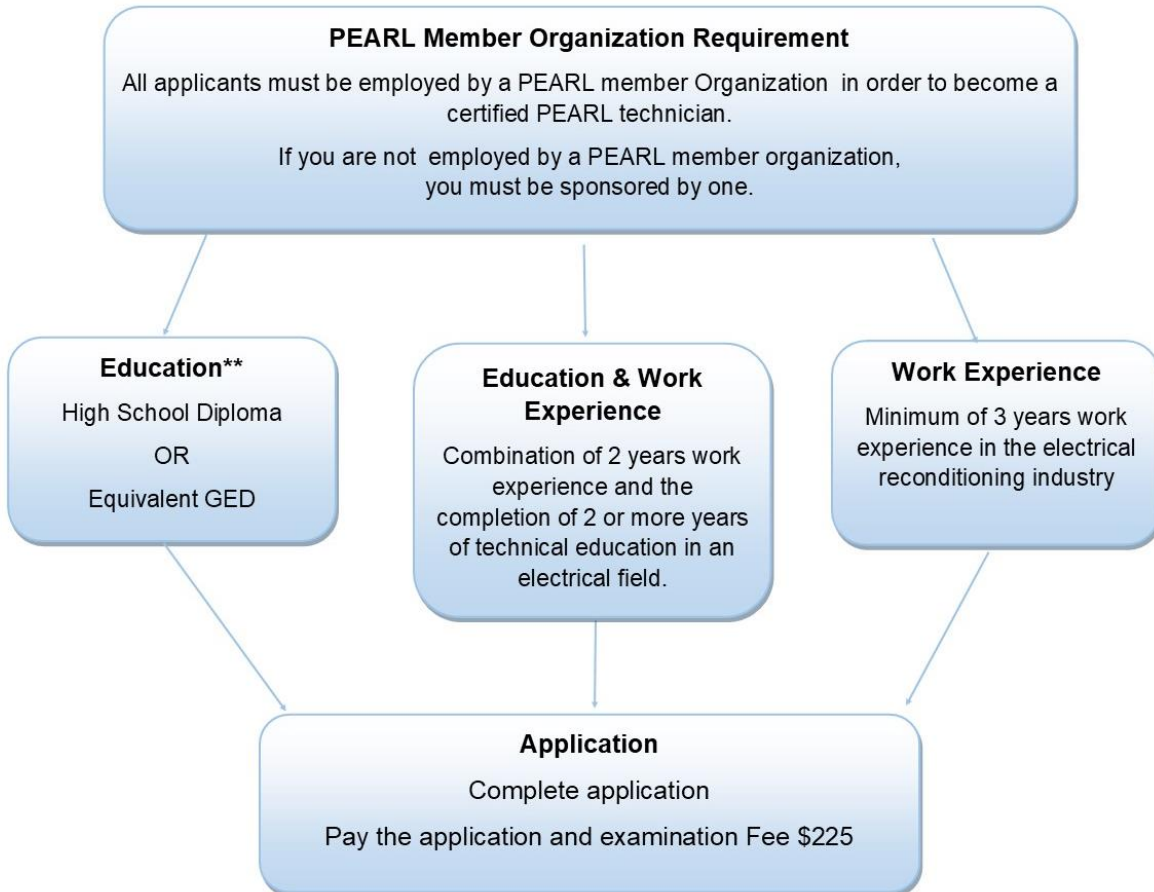
Eligibility Criteria for Taking the Exam

Level I PEARL Certification is designed to demonstrate competency at the entry and basic working level. More specifically, Level I certification implies competence in the knowledge and skills required to perform the *Essential Duties* of an entry-level PEARL-certified technician. A Level I technician should, under the supervision of a higher-level technician, be able to work safely on electrical power equipment and be able to identify and use various shop equipment, warehouse equipment, power equipment, and cleaning equipment used in the electrical equipment reconditioning process.

Each certification level has individual eligibility requirements, including required education and training, work history requirements, and the ability to perform specific essential duties. To receive technical certification from PEARL, a Level I technician must have met the following eligibility requirements:

1. Have a high school diploma or equivalent GED, or three (3) years work experience in the electrical reconditioning industry
2. Be currently employed by a PEARL Full Dealer, Full Service, or Satellite Member Organization. Candidates who do not meet this employment requirement may have this requirement waived if they have sponsorship from a PEARL member organization
3. Completed the online application
4. Paid the appropriate application fee
5. Passed the Level I exam

Level I Exam Eligibility*



*For detailed instructions on eligibility, expectations and how to apply, please refer to the PEARL Certification Handbook

**Although not required, it is recommended to have 1 year experience in the electrical reconditioning industry

Although work experience for Level I is only required if a candidate does not have a high school diploma or GED, it is recommended that Level I candidates have a minimum of one year of relevant industry experience working for a company that performs electrical equipment reconditioning as well as performing the Essential Duties listed below. Many candidates without the recommended experience have difficulty successfully completing the test.

Essential Duties for Level I

1. Familiar with general shop safety procedures such as correct use of portable fire extinguishers, ladders, and inspection of electrical extension cords; how to recognize sources of safety information such as OSHA 29CFR, NFPA 70E; and be able to read and interpret visual warning signs, Material Safety Data Sheets (MSDS), and understand the meaning of Lock-out Tag-out (LOTO).

2. Training in accident prevention for a shop environment; understands and observes back safety and proper lifting procedures; able to apply first aid, CPR, and AED if needed; and proper use of personal protection equipment (PPE) for a shop environment, including foot, hand, eye, hearing, and breathing protection as required for the job task being performed.
3. Able to safely operate a shop forklift, assist in equipment loading and unloading, and ensure the safe operation of warehouse or shop cranes.
4. Understands the chemical and material hazards found in a shop equipment reconditioning environment, particularly hazardous materials such as asbestos, PCBs, polishing water, lead paint, cleaning solvents, and thinners used in the manufacturing of electrical equipment.
5. Able to follow safe and proper use of various hand, power, and pneumatic tools used in a shop reconditioning environment.
6. Able to interpret source materials regarding hardware, fasteners, and torque values; able to select appropriate bolt grades, hardware, and fasteners when performing basic maintenance repairs and reconditioning functions to electrical equipment; able to use and understand a bolt grade and strength chart.

7. Has a fundamental understanding of the various forms of metal corrosion, the conditions under which they occur, and how they can be addressed and controlled.
8. Capable of solving mathematical problems requiring simple addition, subtraction, multiplication, division, and fractions.
9. Able to understand basic electricity and how it works, as well as the ability to measure current, voltage, and resistance.
10. Able to identify and match basic test and measurement equipment to the task being performed, as well as able to determine if equipment is in current calibration and can make simple test connections and test.
11. Recognize basic electrical symbols and the components they represent on an electrical wiring schematic.
12. Has a fundamental knowledge of common acronyms, symbols, and abbreviations used in the electrical equipment reconditioning business.
13. Understands the cleaning processes specific to reconditioning electrical equipment, and be able to properly use shop cleaning equipment and cleaning materials safely.
14. Able to identify the names of major component parts of low-voltage equipment, and understands their mechanical and electrical functions and nameplate values.
15. Able to perform pre-reconditioning inspection and cleaning tasks on low-voltage equipment, and assist on basic maintenance, repairs, and rebuilding of low-voltage electrical equipment.
16. Understands and able to use OEM instruction, operation, and maintenance catalogs, and be able to use an OEM renewal part bulletin to identify and research a component part number.
17. Has a fundamental knowledge and awareness of electrical equipment counterfeiting in the U.S., the potential impact of counterfeit parts, and how to recognize potential counterfeit parts and PEARL's position toward counterfeit products.
18. Has a general understanding of the PEARL Standards, including the Reconditioning Standard as well as the Standard Terms & Warranties and Code of Business Practices.

Continuing Professional Development Policy

All certifications expire three years after an individual's initial certification is awarded and every third year after renewal. Certification renewal will be based on the certificate-holder's activities during that three-year period. Renewal notices are mailed to certificate holders two months before the due date. Renewal applications will be sent to the last postal or email address provided by the certificant. It is the responsibility of the certificate-holder to ensure that his or her certificate remains valid. Certificate renewals that are less than one year past due are subject to the renewal fee plus an additional reinstatement to Active Status fee. If the application with payment is not received by PEARL prior to the expiration date, the certificate will expire. If reinstatement has not occurred one year after the expiration date, retesting will be required to regain certification.

Payment of new testing and/or application fees does not substitute for payment of the full renewal fee when due. However, obtaining a higher level PEARL certification "resets" the established three-year certification period. A certificant will be required to have Active Status on a lower level certification before a higher certification can be awarded.

Conditions of Application for Technicians

1. **PEARL has established policies, procedures, and fees** that govern certification decisions, the uses of certification, and interactions with applicants and certificants. These policies, procedures, and fees may be changed by PEARL at any time without prior notification. Each person who signs any PEARL application accepts and agrees to follow these policies and procedures in all dealings with PEARL.
2. **Each PEARL certification may have multiple criteria** that must be met by a candidate in order for the certification to be conferred. These criteria may be changed by PEARL at any time without prior notification. Individuals who are not resident in, or working in, the United States, Canada, or U.S. territories may not be eligible for certification. These individuals must contact PEARL before applying and may be required to follow additional procedures, with additional fees, to demonstrate they meet the criteria.
3. All applicants and certificants **must comply with the PEARL Code of Ethics** and follow generally accepted ethical practices at all times. For example, acquiring and/or providing specific knowledge of test questions prior to testing, or acquiring or providing assistance during an examination; intentionally providing information to PEARL that is incomplete or inaccurate; or knowingly providing technical services in an unsafe, inaccurate, or unprofessional manner may be cause for denial, suspension, or revocation of certification.
4. PEARL reserves the right to **deny, suspend, or revoke any certification** (pending or awarded) should the association determine that an applicant or certificant has misrepresented information, violated a PEARL policy or procedure, or violated the PEARL Code of Ethics.
5. Maintenance of **current accurate contact information** is the responsibility of the applicant. PEARL requires accurate contact information to communicate to the applicant important information related to testing, certification, and renewal.
6. **The PEARL name, logo, and certification mark** are the property of PEARL and may not be used without the expressed written permission of PEARL.
7. **PEARL approval letters, wallet cards, and certificates** are issued to certificants for their use but remain PEARL property at all times and may be recalled by the association at any time without prior notification.
8. **PEARL test questions and examinations** are the property of PEARL. Any copying, sharing, or distribution of the content of those test questions and/or examinations will be cause for denial, suspension, or revocation of certification.
9. Each person who completes a PEARL application grants PEARL the **right to contact individuals** named in the application to confirm the accuracy of information provided by the applicant.
10. **PEARL certification must be used, represented, and displayed** in accordance with PEARL policies.
11. Each person who is certified by PEARL grants PEARL the **right to provide that information** to others in response to bona fide inquiries. Test scores will be given to the test-taker only, unless the test-taker submits a release form authorizing PEARL to give the scores to another specified individual.
12. **All certifications expire** three years after an individual's initial certification is awarded and every third year after renewal. Certification renewal will be based on the certificant's activities during that three-year period.

13. To **cancel your application** you must submit a signed written request (a letter or email stating you wish to cancel your application) to PEARL. PEARL will reimburse a full refund, less a \$40 administration fee, within four (4) weeks after the scheduled date.
14. **Certification payment** is required with an individual's application. If a certificant's application is denied by PEARL, PEARL will reimburse a full refund, less a \$40 administration fee, within four (4) weeks after the scheduled date.

Exam Payments and Fee Details

Certification payment is required with an individual's application. If an individual's application is cancelled prior to acceptance or denied by PEARL, the application administrative fee will still be charged.

PEARL Level I Certification Exam	\$225.00
Application Administrative Fee (Charged if application is denied or cancelled by applicant)	\$ 75.00
Certification Renewal (good for 3 years)	\$ 75.00
Certification Reactivation Fee (if within 1 year of due date)	\$ 125.00

- **Application Administrative Fee:** \$50.00 (Charged if applicant's supervisor fails to submit approval of employee's application within 30 days of application submission)
- **Application Administrative Fee:** \$50.00 (Charged if applicant fails to schedule AND complete within 90 days of supervisor approval)

Preparing For Your Test

This section addresses a few possible methods for preparing for the PEARL certification exam. Since the applicants and sponsoring PEARL member companies are the most familiar with the applicant's abilities, they are responsible for determining the best method for preparing for the certification exam. Following the suggestions in this section does not guarantee an applicant will pass the certification exam.

Determining Applicant's Preparedness

An individual's preparedness for the certification test depends on a number of things, including amount of practical experience in the vocation and years of education. If you are unsure how prepared you are for the exam, you should review the Exam Content Areas for the associated PEARL Technician Certification level. If the applicant is not familiar with the required subjects for that level, he/she should consider reviewing some of the material listed in the Selected References section of this booklet.

Using the Selected References

After reviewing the Exam Content Areas, the applicant may want to review some of the Selected References. The references in this list were selected to supplement the applicant's knowledge in relevant Exam Content Areas. Experienced candidates only may have to brush-up on a few topics while those with less practical experience may have to study extensively.

Using the Exam Content Areas as a Guide to Your Study

The Exam Content Areas are a basic outline of the exam subject matter. You can use the Exam Content Areas as your study guide by referring to them in the primary selected study references. For example, if the applicant is unfamiliar with area #5 (Recognize lock-out and tag-out (LOTO)), he/she may review that

material in NFPA 70E, Article 120, or OSHA 29 CFR 1910.147 (listed in the Selected References section of this booklet). Many of the selected study references can be found on the Internet at no cost. Other sources not listed also may be helpful in reviewing these subjects. The best preparation for the exam is practical industry experience in an electrical equipment reconditioning and repair facility. No single book is adequate to prepare individuals with the varied experiences they can receive working in an electrical equipment reconditioning and repair facility.

Exam Content Areas for Level I

Exam Content Areas (ECAs):	Skills to:	References:
1. Correct use of portable fire extinguishers	<ul style="list-style-type: none"> - Use proper fire-fighting techniques for each type of fire - Confirm that an extinguisher is of the appropriate type and properly certified for use 	OSHA 29CFR, Parts 1910.157
2. Safe work practices involving ladders	<ul style="list-style-type: none"> - Recognize safe procedures and hazards associated with ladders - Select a ladder that is appropriate to the application and free of defects - Follow correct fall protection procedures 	OSHA 29CFR, Parts 1926 and 1910 ANSI ASC A14 Standards ANSI Z359 Standard on Fall Protection
3. Safe work practices involving electrical extension cords	<ul style="list-style-type: none"> - Recognize safe procedures and hazards associated with electrical extension cords - Select an extension cord that is appropriate to the application and free of defects - Follow correct extension cord use procedures 	OSHA 29CFR, Parts 1926 and 1910
4. Recognize sources of safety information	<ul style="list-style-type: none"> - Read and interpret common shop visual warning signs - Read and interpret common job safety hazard information - Locate information in the MSDS 	NFPA 70E OSHA 29CFR, Parts 1926 and 1910 Electrical Safety Foundation International (ESFI)
5. Recognize lock-out and tag-out (LOTO)	<ul style="list-style-type: none"> - Know the difference between a lock-out and a tag-out device - Respond appropriately to the presence of tags and locks - Recognize potential hazards of stored energy 	NFPA 70E, Article 120 OSHA CFR 1910.147
6. Apply first aid and CPR if needed	<ul style="list-style-type: none"> - Recognize situations requiring first aid or CPR - Apply standard first aid - Apply CPR - Use an AED 	OSHA 29CFR, Parts 1926 and 1910, 1,2,3,4,5,6 NFPA70E American Red Cross First Aid Manual American Heart Association Guidelines for CPR
7. Safe work practices for safe lifting and material handling	<ul style="list-style-type: none"> - Recognize situations requiring safe lifting practices - Safe lifting and carrying techniques 	OSHA Technical Manual (OTM), Section VII, Chapter 1 American Red Cross First Aid Manual
8. Proper use of personal protective equipment, including safety shoes, safety glasses, hearing protection, breathing apparatus, and work gloves	<ul style="list-style-type: none"> - Recognize when and what PPE is needed - Know how to properly put on, adjust, wear, and remove the PPE - Useful life and limitations of the PPE - Proper care, storage, and disposal of the PPE 	OSHA 29CFR, Parts 1926 and 1910, 1,2,3,4,5,6 NFPA 70E, article 130.7
9. Safe work practices for forklift operation	<ul style="list-style-type: none"> - Verify a vehicle's inspection and maintenance - Determine a vehicle's operating limitations - Perform proper load manipulation, stacking, and un-stacking - Navigate narrow aisles and ramps that could affect vehicle's stability 	OSHA 29CFR, Parts 1910.178 ANSI/ITSDF B56, Industrial Power Truck Standards
Exam Content Areas (ECAs):	Skills to:	References:
10. Recognize and evaluate types of hazardous materials associated with the reconditioning of electrical equipment, including asbestos, PCBs, polishing water, cleaning solvents, paint and thinners, and lead paint	<ul style="list-style-type: none"> - Recognize potential hazardous materials in a service shop - Recognize shop operations that could result in hazardous materials exposure - Proper handling and care of hazardous materials 	OSHA 29CFR, Parts 1910.120 EPA, 40 CFR Toxic Substances Control Act (TSCA)
11. Safe work practices for safe operation of various hand, power, and pneumatic tools	<ul style="list-style-type: none"> - Perform proper tool safety inspections - Select proper PPE when using power tools 	OSHA Standard 29 CFR 1910.241

used in a shop reconditioning environment		
12. Interpret sources of information regarding hardware and fasteners, including torque values, hardware grades, and strength charts	<ul style="list-style-type: none"> - Read and interpret a bolt grading and strength chart - By visual inspection determine a bolt's grade - Read and interpret a bolt torque chart - Ability to torque a bolt using a torque wrench 	NETA MTS SAE J429 Society of American Engineers
13. Able to recognize various forms of metal corrosion, and understand the conditions under which they occur and can be controlled	<ul style="list-style-type: none"> - Recognize different metals and how they react to corrosion - Determine if corrosion is present and its severity - Recognize various metals and the different electrical and mechanical characteristics they possess 	
14. Able to solve simple mathematical problems requiring addition, subtraction, multiplication, division, and fractions	<ul style="list-style-type: none"> - Measure using customary units of measurement such as length, area, perimeter, volume, weight, and temperature - Perform and verify part dimensions by using various handheld gauges such as calipers and micrometers - Ability to determine correct trip unit test values at different percentages 	
15. Able to identify test equipment and correctly measure electrical current, voltage, and resistance	<ul style="list-style-type: none"> - Measure voltage, current, and resistance, and make basic test connects 	
16. Visual inspection of low-voltage electrical equipment for damaged insulation and perform basic insulation test	<ul style="list-style-type: none"> - Operate a circuit breaker and contactor including auxiliary devices - Test insulation system of a circuit breaker - Recognize different types of electrical insulators 	ANSI/NETA Standard for Acceptance Testing Specifications ANSI/NETA Standard for Maintenance Testing
17. Recognize basic electrical symbols on a legend associated with an electrical wiring diagram on a low-voltage circuit breaker or motor control bucket	<ul style="list-style-type: none"> - Identify the wiring point necessary to test an electrical device - Identify the control and power circuit of an electrical device - Identify standard elementary diagram nomenclature 	IEEE electrical symbols OEM application guides
18. Recognize and understand common acronyms and abbreviations used in the electrical equipment reconditioning industry	<ul style="list-style-type: none"> - Identify and use EASA condition reference acronyms - Recognize industry standards and providers 	NEMA EASA Handbook PEARL Reconditioning Standards OEM application guides
19. Performs reconditioning teardown inspection and evaluation as well as cleaning task on low-voltage electrical equipment	<ul style="list-style-type: none"> - Identify any damaged or missing parts - Identify the appropriate test equipment - Evaluate damage and non-conforming components - Identify the appropriate reference materials for the product - Ability to properly use shop cleaning equipment and cleaning materials safely 	PEARL Reconditioning Standards OEM instruction and maintenance bulletins
Exam Content Areas (ECAs):	Skills to:	References:
20. Recognize the names of major component parts of low-voltage equipment	<ul style="list-style-type: none"> - Identify electrical equipment control accessories - Identify electrical equipment protective devices - Ability to identify the basic components of a circuit breaker, contactor, and switch - Ability to identify the basic components of switchgear that interact with the switching element 	PEARL Reconditioning Standards OEM manufacturing installation and maintenance manuals OEM application guides
21. Recognize basic electrical equipment markings and nameplate information	<ul style="list-style-type: none"> - Read and interpret a manufacturer's equipment nameplate - Verify equipment interrupting rating from available nameplate data and/or component markings - Verify charging and closing voltages and currents from available nameplate data and/or component markings - Verify equipment tripping characteristics from available nameplate data and/or component markings 	ANSI C37.13 IEEE Standard for Low-Voltage AC Power Circuit Breakers OEM application guides and equipment manuals

	<ul style="list-style-type: none"> - Ability to distinguish between indoor, outdoor, walk-in, non-walk-in, NEMA 1, and NEMA 3R type electrical equipment 	
22. Performs basic maintenance, repairs, and rebuilding of low-voltage electrical equipment	<ul style="list-style-type: none"> - Identify the reconditioning steps required for the reconditioning of the equipment - Perform and verify mechanical adjustments on electrical equipment - Recognize and perform any necessary metal treatment - Ability to disassemble and perform inspection of electrical equipment per PEARL reconditioning standards - Ability to select the appropriate processes required to perform maintenance and rebuilding of electrical equipment 	PEARL Reconditioning Standards OEM manufacturing maintenance manuals
23. Recognize appropriate sources of equipment information	<ul style="list-style-type: none"> - Ability to recognize source of information and select appropriate literature for identifying components on electrical equipment - Ability to collect relevant data from an electrical device nameplate - Ability to distinguish between manually operated and electrically operated devices - Ability to distinguish between draw-out and bolt-in type electrical equipment - Ability to determine equipment frame size rating - Ability to identify correct part numbers using manufacturer's renewal parts catalog - Know how to research reference materials to find a part - Know how to use an index, table of contents, and glossary 	Electrical manufacturer's instruction manuals, operating manuals and renewal parts bulletins
24. Recognize sources of information and the dangers of counterfeit molded case breaker products	<ul style="list-style-type: none"> - Recognize the sources for identifying counterfeit products - Recognize the common indicators of counterfeit products - Recognize the types of electrical products most commonly affected by counterfeiting 	Electrical Safety Foundation International (ESFI) – <i>Buyer Beware</i> Anti-Counterfeiting Campaign NEMA Anti-Counterfeiting Public Policy PEARL recall and counterfeit notices and labeling policy OEM anti-counterfeiting training Available OEM counterfeiting notices and tools
25. Understands standard industry selling terms and warranties for PEARL members	<ul style="list-style-type: none"> - Understands the industry selling terms used for describing various conditions of electrical equipment 	PEARL Standard Terms & Warranties Policy

Sample Test Questions

The following sample test questions are provided to help candidates become familiar with the question format. The following questions reflect only a sample of the subject matter covered on the test. An answer key is given at the end of this section.

Level I

1. What type of fire extinguisher is this?

- A. Air-pressurized water extinguisher
- B. CO₂ (carbon dioxide) extinguisher
- C. Dry chemical extinguisher
- D. Multipurpose dry chemical extinguisher



2. Which of the following industry references were designed specifically for electrical safety in the workplace?

- A. ANSI
- B. UL 508A
- C. NFPA-70E
- D. NEC

3. An MSDS is a document that contains which of the following information? (Choose 3)

- A. How to work safely with a chemical product
- B. Storage and handling of chemical products
- C. Emergency procedures related to hazards of materials
- D. Proper chemical material mixing procedures

4. Which of the following are sources for knowing which first aid procedures to follow for chemicals in your place?

- A. MSDS
- B. NFPA-70E
- C. OSHA 1910
- D. ANSI

5. Which of the following is the correct ampere rating for a 600A trip unit with a 75% rating plug install?

- A. 500A
- B. 150A
- C. 800A
- D. 450A

6. When asbestos fibers become airborne, what is the primary health risk?

- A. Lung disease
- B. Allergies
- C. Eye disease
- D. Skin disease

7. Which of the following does an insulation test set measure?

- A. Amperes
- B. Resistance
- C. Trip rating
- D. Voltage

8. Which of the following does this electrical symbol represent?



- A. Ground
- B. Normally open contact
- C. Pilot light
- D. Thermal overload

9. Which of the following best describes what “FLA” stands for according to PEARL?

- A. Front load amperes
- B. Forced load amperes
- C. Full load amperes
- D. Fuse load amperes

10. According to PEARL, which of the following are not required when performing an evaluation of a low-voltage circuit breaker?

- A. Digital low resistance test set or DC current source
- B. Secondary injection test set
- C. High current test set
- D. Insulation resistance test set

Sample Test Answers:

1. B
2. C
3. A,B,C
4. A
5. D
6. A
7. B
8. D
9. C
10. B