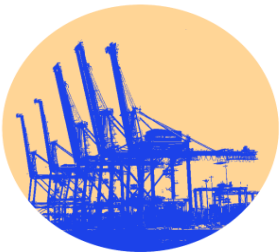


# 2015 MAINTENANCE TRAINING GUIDE



## **PTTI**

Port Technical Training Institute  
1160 McLester St., Unit #8, Elizabeth, NJ 07201  
Phone: 908-355-0758 Fax: 908-355-2171  
Web: [www.porttechnicaltraining.com](http://www.porttechnicaltraining.com)



## **MMMCA**

Metropolitan Marine Maintenance Contractors Association, Inc.  
301 Route 17N, 7<sup>th</sup> Floor  
Rutherford, NJ 07070  
Phone: 201-842-0202  
Web: [www.mmmcassoc.com](http://www.mmmcassoc.com)

The following 2015 Maintenance Training Guide is intended to be a complete compendium of training available to maintenance employees. Included, as an overview, is a table to guide course selection by shop area or position to include course level (entry, intermediate, advanced), course length as well as any course prerequisites. Highly recommended and/or required courses are also listed. These courses are recommended for a safe workplace, are required, in many cases, by various regulatory/oversight agencies and could subject employers to fines if an inspection/audit revealed that this training was not performed. Many of these courses are flexible and can be modified to suit specific employer needs. Some of these courses can be conducted at an employer’s site location if this is desirable. Additional courses can be developed upon request. At the end of the guide is a listing, as a reference, of recommended/required training areas with regulatory references and selected requirements.

- I. Summary Table – Recommended Courses By Position** **Page 3**
  
- II. 2015 Courses Offered** **Page 4**
  - Recommended / required Safety Courses for all Port Personnel Page 4
  - Recommended / required Equipment Operator Courses for Mechanics and Equipment Operators Page 6
  - Courses for Crane, RTG/RMG and Straddle Carrier Mechanics Page 7
  - Courses for Power Shop Mechanics Page 10
  - Courses for Reefer Shop Mechanics Page 12
  - Courses for M&R Shop Mechanics Page 14
  - Courses for TIR Inspectors Page 16
  - Courses for Facility Maintenance Shop Mechanics Page 16
  - Courses for Welders Page 17
  
- III. Recommended / Required Training Areas – Regulatory References & Selected Requirements** **Page 18**

## Summary Table - Recommended Courses by Position

**Summary reference table of recommended training courses by position with skill level, prerequisites and course length shown.**

| Course  | Recommended Prerequisites                   | Length Days  | Maintenance Personnel Type |         |          |       |        |     |          |     |        |   | Comments                          |
|---|---|--------------|----------------------------|---------|----------|-------|--------|-----|----------|-----|--------|---|-----------------------------------|
|   |   |              | Crane                      | RTG/RMG | Straddle | Power | Reefer | M&R | Facility | TIR | Welder |   |                                   |
| <b>Core Courses Applying to Most Maintenance Employees</b>  |   |              |                            |         |          |       |        |     |          |     |        |   |                                   |
| R = Required / Recommended                                  |   |              |                            |         |          |       |        |     |          |     |        |   |                                   |
| 1   | ELECTRICAL HAZARD AWARENESS                 | None         | 1                          | R       | R        | R     | R      | R   |          | R   |        |   | Required by NFPA/OSHA             |
| 2   | RIGGING                                     | None         | 2                          | R       | R        | R     |        |     |          |     |        | R |                                   |
| 3   | OXYGEN & ACETYLENE (Cert of Fitness)        | None         | 1                          | R       | R        | R     | R      | R   | R        | R   |        | R | Required by NYFD/PA/USCG/ANZI     |
| 4   | GHS (HAZARDOUS COMMUNICATION)               | None         | 1/2                        | R       | R        | R     | R      | R   | R        | R   | R      | R | Required by OSHA                  |
| 5   | POWER INDUSTRIAL TRUCK                      | None         | 1/2                        | R       | R        | R     | R      | R   | R        | R   |        | R | Required by OSHA                  |
| 6   | FORKLIFT OPERATOR TRAINING                  | 5            | 2                          | R       | R        | R     | R      | R   | R        | R   |        | R | Required by OSHA                  |
| 7   | YARD TRACTOR OPERATOR TRAINING              | 5            | 5                          |         |          |       | R      | R   | R        |     |        |   | Required by OSHA                  |
| <b>Technical/Skill Courses by Area</b>                      |   |              |                            |         |          |       |        |     |          |     |        |   |                                   |
| E = Entry Level, I = Intermediate Level, A = Advanced Level |   |              |                            |         |          |       |        |     |          |     |        |   |                                   |
| 8   | CRANE/RTG/Straddle ELECTRIC 101             | None         | 8                          | E       | E        | E     |        |     |          |     |        |   |                                   |
| 9   | CRANE/RTG/Straddle ELECTRIC 102             | 8            | 8                          | I       | I        | I     |        |     |          |     |        |   |                                   |
| 10  | CRANE/RTG/Straddle ELECTRIC 103             | 8,9,17       | 8                          | A       | A        | A     |        |     |          |     |        |   |                                   |
| 11  | STS CRANE                                   | None         | 3                          | E       |          |       |        |     |          |     |        |   |                                   |
| 12  | HYDRAULICS 101                              | None         | 8                          | E       | E        | E     | E      |     |          |     |        |   |                                   |
| 13  | HYDRAULICS 102                              | 8,12         | 8                          | A       | A        | A     | A      |     |          |     |        |   |                                   |
| 14  | P L C 101                                   | 8,9,10,17    | 8                          | A       | A        | A     | A      |     |          |     |        |   |                                   |
| 15  | P L C 102                                   | 8,9,10,14,17 | 8                          | A       | A        | A     | A      |     |          |     |        |   |                                   |
| 16  | FIBER OPTICS                                | None         | 4                          | E       | E        |       |        |     |          |     |        |   |                                   |
| 17  | IEC SCHEMATICS                              | 8            | 2                          | I       | I        | I     | I      |     |          |     |        |   |                                   |
| 18  | SPREADER 101                                | 8,12,17      | 8                          | I       | I        | I     | I      |     |          |     |        |   |                                   |
| 19  | HIGH VOLTAGE BASICS                         | 8            | 2                          | A       | A        |       |        |     |          | A   |        |   |                                   |
| 20  | MOBILE EQUIPMENT A/C                        | None         | 6                          | E       | E        | E     | E      | E   |          |     |        |   |                                   |
| 21  | STS CRANE OPERATOR TRAINING                 | None         | 5                          | E       |          |       |        |     |          |     |        |   |                                   |
| 22  | RUBBER Tired GANTRY                         | 8,12,17      | 8                          |         | I        |       |        |     |          |     |        |   |                                   |
| 23  | ELECTRIC STRADDLE (Hybrid equipment)        | 8            | 8                          |         |          | I     |        |     |          |     |        |   |                                   |
| 24  | DIESEL ENGINES 101                          | None         | 8                          |         | E        | E     | E      |     |          |     |        |   |                                   |
| 25  | DIESEL ENGINES 102                          | 24           | 8                          |         | A        | A     | A      |     |          |     |        |   |                                   |
| 26  | POWER SHOP ELECTRIC 101                     | None         | 8                          |         | E        | E     | E      |     |          |     |        |   |                                   |
| 27  | POWER SHOP ELECTRIC 102                     | 26           | 8                          |         | I        | I     | I      |     |          |     |        |   |                                   |
| 28  | POWER SHOP ELECTRIC 103                     | 26,27        | 8                          |         | A        | A     | A      |     |          |     |        |   |                                   |
| 29  | BRAZING FOR REFRIGERANT TUBING              | None         | 1                          |         |          |       |        | E   |          |     |        | E |                                   |
| 30  | REFRIGERATED CONTAINER 101                  | None         | 8                          |         |          |       |        | E   |          |     |        |   |                                   |
| 31  | REFRIGERATED CONTAINER 102                  | 30           | 8                          |         |          |       |        | I   |          |     |        |   |                                   |
| 32  | REFRIGERATED CONTAINER GENERATOR            | None         | 3                          |         |          |       |        | E   |          |     |        |   |                                   |
| 33  | REFRIGERATED CONTAINER GENERATOR CONTROLS   | 32           | 2                          |         |          |       |        | I   |          |     |        |   |                                   |
| 34  | REFRIGERANT GAS 608 ACCA CERTIFICATION      | 30           | 3                          |         |          |       |        | E   |          |     |        |   | Required by the EPA Clean Air Act |
| 35  | REFRIGERANT GAS 609 MACS CERTIFICATION      | 30           | 3                          |         |          |       | E      | E   |          |     |        |   | Required by the EPA Clean Air Act |
| 36  | CHASSIS AIR/ABS BRAKES & INSPECTION         | None         | 8                          |         |          |       |        |     | E        |     |        |   | Required by the DOT/FMCSA         |
| 37  | ANNUAL CHASSIS INSPECTION / BRAKE INSPECTOR | None         | 2                          |         |          |       |        |     | E        |     |        |   | Required by the DOT/FMCSA         |
| 38  | CHASSIS OUT OF SERVICE CRITERIA             | None         | 1                          |         |          |       |        |     |          |     | E      |   | Required by the DOT/FMCSA         |
| 39  | FMCSA RULES & REGULATIONS UPDATE            | None         | 1                          |         |          |       |        |     | E        |     | E      |   | Required by the DOT/FMCSA         |
| 40  | CONTAINER REPAIR                            | None         | 8                          |         |          |       |        |     | E        |     |        |   |                                   |
| 41  | FACILITY BASIC ELECTRICAL                   | None         | 8                          |         |          |       |        |     |          | E   |        |   |                                   |
| 42  | WELDING 101                                 | None         | 8                          |         |          |       |        |     |          |     |        | E | Required by OSHA/ANZI/USCG        |
| 43  | WELDING 101B                                | 42           | 8                          |         |          |       |        |     |          |     |        | I | Required by OSHA/ANZI/USCG        |
| 44  | WELDING 102                                 | 42           | 8                          |         |          |       |        |     |          |     |        | A | Required by OSHA/ANZI/USCG        |
| 45  | WELDING 103                                 | 42,44        | 8                          |         |          |       |        |     |          |     |        | A | Required by OSHA/ANZI/USCG        |

***All courses include custom binders, prepared by PTTI instructors, and technical books. Certain courses include meters, tools and safety equipment for the student to be better prepared in the workplace. Each student receives a Certificate of Completion for each completed course.***

**Recommended/Required Safety Courses for all Port Personnel**

**Comprehensive Port & Terminal Awareness Program – Length 5 Days**

*Course prerequisites: none.*

This program includes the following courses: Electrical Hazard Awareness, GHS Hazardous Communication, Powered Industrial Truck, Safe handling of Oxygen & Acetylene and Rigging.

**Electrical Hazard Awareness – Length 1 Day**

*Course prerequisites: none.*

This is an entry level course covering an introduction to Electrical Hazards tailored to the port environment working around electrical panels, covering Lock Out, Tag Out, Arc-Flash Hazards, Arc-Blast, Electrical Dead Work (injuries incurred while performing work on what is assumed to be dead equipment), effects of Electrical Shock. The objective of this course is for the student to understand the hazards of working around electrical equipment and to know the proper PPE to be worn in different categories of electrical work. This course covers NFPA 70E regulations and is for all maintenance personnel working on or near electricity (control voltage DC 60, AC 120 volts or higher).

**GHS Hazardous Communication – Length ½ Day for Basic, 1 Day for Comprehensive**

*Course prerequisites: none.*

*All workers need to be trained about the hazards present in the chemical substances they use on the job (fuels, lubricants, paints, primers, adhesives, solvents, etc.) Employers shall train employees regarding the new label elements and safety data sheets format by 12/1/2013.*

This course covers OSHA's Hazard Communication Standard, labeling, physical and health hazards of handling chemicals, material safety data sheets (MSDS), Personal Protective Equipment (PPE).

**Rigging – Length 2 Days, (1 Day More Basic Available)**

*Course prerequisites: none.*

*Applicable to all mechanics, gear men, heavy lift personnel and marine superintendents using slings in their work environment.*

This is an entry level course covering an introduction to Rigging principles, proper hardware applications(ex. slings, knots, hooks, shackles, eye bolts, etc...), rigging (loads, rigging triangle, COG), inspection on rigging hardware, wire rope clips and terminations. The objective of this course is for the student to understand the proper procedures for overhead lifting as per current OSHA and ASME standards.

**Welding Gas Handling (Certificate of Fitness for Safe Handling of Oxygen and Acetylene) - Length 1 Day**

*Course prerequisites: none.*

*Applicable to all mechanics who handle a torch for welding, cutting and burning.*

This is an entry level course covering an introduction to Oxy-Acetylene Gas Welding & Cutting equipment, preparation, regulators, operation and applications, cutting attachments, cutting torches, cutting tips, heating assemblies, heating tips, peripheral equipment, fire extinguishing devices and systems, The objective of this course is for the student to understand the proper procedures to handling Gas Welding & Cutting equipment. Demonstration and practice on proper lighting and adjusting the flame, shutting down and cleaning up.

### **Recommended/Required Equipment Operator Courses for Mechanics and Equipment Operators**

*Any mechanic who drives a forklift, yard tractor, man lift, container handler, etc. must have a 4 hour PIT course (plus they must have hands-on training for the specific piece of equipment they are operating). Available courses:*

#### **Powered Industrial Truck (PIT): General Safety & Awareness – Length ½ Day**

*Course prerequisites: none.*

This is an entry level course covering the minimum OSHA 29 CFR 1910.178, 29 CFR 1917 & 29 CFR 1918 requirements for powered industrial trucks (PIT). The objective of this course is for the student to understand the requirements of OSHA's PIT Operator standard: safe operation of various types of equipment used in marine terminals, hazard identification, abatement methods and procedures. Certification given upon successful completion of the course.

#### **Forklift Operator Training – Length 2 Days**

*Course prerequisites: Powered Industrial Truck: General Safety & Awareness.*

This course covers the OSHA safe operation of general use forklifts including 4 hours of classroom training followed by one and half days of hands-on training. The objective of this course is to ensure that the operator has knowledge and skills needed to operate forklifts. Certification given upon successful completion of the course.

#### **Yard Tractor Driver Training – Length 5-10 Days depending on experience**

*Course prerequisites: Powered Industrial Truck: General Safety & Awareness.*

This is an entry level course covering operation and handling of terminal yard tractor with chassis and/or container. The course covers the operation of yard tractor including four hours of classroom training followed by hands-on training. Certification given upon successful completion of the course.

#### **Crane Operator Training – Length 5 Days**

*Course prerequisites: none.*

The course covers the safe operation of STS Cranes including eight hours of classroom training followed by 32 hours of hands-on training at your site. The objective of this course is for the student to be able to identify the crane components & controls, understand the basic workings of a STS Crane and be able to safely operate a STS Crane.

**Courses for Crane, RTG/RMG and Straddle Carrier Mechanics**

**Crane/RTG/Straddle Electric 101 – Length 8 Days**

*Course prerequisites: none.*

This is an entry level course covering basic electrical theory, electrical circuits & devices found on Cranes, RTGs and Straddle Carriers. The objective of this course is for the student to understand the Cranes/RTG/Straddle electrical system and be able to use a digital multi-meter for testing and troubleshooting.

This course covers Electrical Safety (PPE in the workplace); Electrical Quantities (what your digital multi-meter is measuring); Series / Parallel circuits (differences in testing and troubleshooting); Switches and switching concepts; Electromagnetism (how they work, testing and troubleshooting coils, relays, solenoids); AC vs. DC voltage / current and Transformer concepts.

**Crane/RTG/Straddle Electric 102 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101.*

This is an intermediate level course covering the principles of DC and AC Motors & Generators, Solid-State devices, Motor Starters, Overload Relays, Relays, Contactors, Sensors, Control Transformers,. The objective of this course is for the student to understand the Cranes/RTG/Straddle motors and components and be able to troubleshoot faults and perform preventative maintenance.

This course covers principles of Motor Control, Solid-State devices, Motor Starters, Overload Relays, Relays, Contactors and Motor Starters, Sensors, Control Transformer, Motor Control circuits, DC and AC Motor control, symbols and schematic diagrams, reading large schematic diagrams, DC and AC motors. Labs performed utilizing Delmar's Virtual Laboratory in Industrial Motor Control.

**Crane/RTG/Straddle Electric 103 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101, 102 and IEC Schematics.*

This is an advanced level course covering the principles of DC & AC Motor Controls, Testing Equipment and Troubleshooting. The objective of this course is for the student to understand the principles of DC & AC Motor Controls and to be able to troubleshoot using an oscilloscope, motor insulation tester and advanced digital multi-meter techniques.

This course covers advanced electrical troubleshooting on DC, single-phase and three-phase AC circuits, components and motors, collecting information, detailed use of diagrams, practical on-line troubleshooting, specialized tests and equipment, Hands-on labs include fault finding on circuits utilizing the Lab-Volt Industrial Motor Controls Training System with test equipment (insulation tester, DC/AC TRMS clamp meter, Digital Multi-Meter).

### **Electric Straddle Carrier – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101.*

This course is an intermediate level course covering the dangers, warnings, cautions and notices when working on a hybrid Straddle Carrier. The objective of this course is for the student to learn different types of Drives and AC components utilized for safe operation of Electric Straddle Carriers plus how to test and troubleshoot for faults.

This course covers Dangers, Warnings, Cautions and Notices when working on hybrid equipment, Electrical Safety, AC Electrical Theory and Basic circuits on Variable Frequency Drives, PPE requirements. Different types of drives for front and back end, AC components utilized for operation of equipment. Variable Frequency drives utilizing Lab-Volt's Industrial Motor Controller Training System. Specialized tests and equipment, Hands-on labs include DC / AC voltage testing with test equipment (insulation tester, DC/AC TRMS clamp meter, Digital Multi-Meter).

### **IEC Electrical Schematics – Length 2 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101.*

This is an intermediate level course designed for students to learn how to read IEC Electrical Schematics. The objective of this course is for the student to identify and name the various types of symbols, understand the color-coding insulation identification system and learn how to follow the various types of circuits for troubleshooting.

### **Fiber Optics – Length 4 Days**

*Course prerequisites: none.*

This course is an entry level course covering an introduction to fiber optics, fiber theory, cables, connectors and terminations, fusion splicing, mechanical splicing, installation, test equipment, restoration and maintenance, system components, design issues, system design exercise. The objective of this course is for the student to understand the fundamentals of fiber optics, be able to troubleshoot the system and be able to splice cables. Hands-on labs performed to include fusion splicing, terminations / connectors, cable preparation, OTDR operation and optical loss testing.

### **High Voltage Basics (over 600 volts) – Length 2 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101.*

This is an advanced level course covering high voltage theory, safety, arc-flash and grounding in accordance to NFPA 70E (Standard for Electrical Safety in the Workplace). The objective of this course is for the student to be able to identify high voltage equipment and to understand the hazards associated with it.

### **Hydraulics 101 – Length 8 Days**

*Course prerequisites: none.*

This is an entry level course covering the basic principles of hydraulics, hydraulic components (actuators, pumps, motors, valves and ancillary hydraulic mechanisms), symbols, circuitry and schematics. The objective of this course is for the student to be able to identify and name the various hydraulics components, understand how these components work together, be able to read hydraulic schematics and troubleshoot faults. Hands-on labs performed using the Lab-Volt Hydraulics Trainer and LVVL Hydraulics Simulator.



### **Hydraulics 102 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101 & Hydraulics 101.*

This is an advanced level course covering the Electrical Control of Hydraulic Systems with sensors, servo controls, control relays, timers, counters, pressure switches and proportional controls. The objective of this course is for the student to be able to name and identify the hydraulic electrical controls, understand how these electrical devices control hydraulic components and be able to troubleshoot and test for faults. Hands-on labs performed using the Lab-Volt Hydraulics Trainer and LVVL Hydraulics Simulator.

### **PLC 101 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101, 102, 103 and IEC Schematics.*

This is an advanced level course covering the basics of Programmable Logic Controllers (PLCs), Input and Output modules and Counters and Timers. The objective of this course is for the student to understand the basics of PLCs, be able to name and identify the components associated with PLCs and to be able to read logic diagrams. Hands-on labs performed on the Siemens S7-200, Omron CPM1A and Allen-Bradley Micrologix 1000 including troubleshooting, understanding and interpreting PLCs in schematics.

### **PLC 102 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101, 102, 103, PLC 101 and IEC Schematics.*

This is an advanced level course covering the troubleshooting and maintenance programming of PLCs. The objective of this course is for the student to be able to log into a PLC program for troubleshooting, testing and minor programming. The student will learn how to view and edit parameters, view motor and control status, view, view and force limit switches and how to decipher and debug faults. Hands-on labs performed utilizing the Lab-Volt Siemens S7-200, Omron CPM1A or Allen-Bradley Micrologix 1000 with Hydraulics and / or Motor-Control Trainer(s).

### **Rubber Tired Gantry – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101, Hydraulics 101 and IEC Schematics.*

This is an intermediate level course covering RTG/RMG components and their locations, Diesel Engine Control, Power Generation, Spreader, Steering and Hydraulics. The objective of this course is for the student to be able to identify and name the various components of an RTG/RMG, understand how the components work together for a safe operation, be able to perform routine maintenance tasks and be able to effectively troubleshoot faults.

### **Spreader 101 – Length 8 Days**

*Course prerequisites: Crane/RTG/Straddle Electric 101, Hydraulics 101 and IEC Schematics*

This an intermediate level course covering spreader controls, components, electrical system, hydraulic system, mechanical systems, troubleshooting and maintenance. The objective of this course is for the student to be able to identify and name all of the spreader components, understand how all of the components work together for safe operation, perform routine maintenance tasks and be able to troubleshoot faults.

### **STS Crane Course – Length 3 Days**

*Course prerequisites: None*

This is a beginner level course covering the STS Crane components and their locations, Power Sources, Spreader and Control Functions. The objective of this course is for the student to be able to name and identify all of the STS Crane components, understand how all of these components work together, learn how to perform routine maintenance tasks and be able to effectively troubleshoot faults.

### **Courses for Power Shop Mechanics**

*Mechanics working on 12/24 volt Straddle Carriers, Forklifts, Yard Tractors, Reach Stackers, Top Picks, Empty Container Handlers & Pick-up Trucks*

#### **Diesel Engines 101 – Length 8 Days**

*Course prerequisites: none.*

This is an entry level course covering mechanical operation of a diesel engine. The objective of this course is for the student to be able to identify and name the mechanical components of a diesel engine, understand how a diesel engine operates and to be able to identify faults. The course covers compression verses spark, fuel systems (Cummins), lube system (Cummins), combustion, turbo, basic servicing (fuel filters, injectors...), preventative maintenance, problem solving (how does it work, repair procedures, basic troubleshooting, causes, effects...) and working around heavy duty batteries.

#### **Diesel Engines 102 – Length 8 Days**

*Course prerequisites: Diesel Engines 101.*

This is an advanced course covering Diesel Engine Performance and Diagnostics, Parameter Output verification and Efficiency analysis, Computer Processing / Outputs, Fault Codes, Control System Adjustments, System or Component malfunctions, Corrective Procedures and Troubleshooting.

#### **Mobile Equipment A/C – Length 6 Days**

*Course prerequisites: none.*

This course is structured to teach the basic principles of air conditioning theory (Refrigeration Cycle), System Components and Functions and Electronic Controls, System Service Procedures, System Diagnostics. MACS (Mobile Air-Conditioning Systems) or MVAC (Mobile Vehicle Air-Conditioning) and a 609 Certification exam given. The 609 Certification can be used on all passenger cars, trucks and off-road equipment that isn't commercial refrigeration as long as R-134a or R-22 is utilized.

#### **Power Shop Electric 101 – Length 8 Days**

*Course prerequisites: none.*

This is an entry level course covering the electrical systems on port power equipment (forklifts, reach stacker, top picks, empty container handler and yard tractor). The objective of this course is for the student to be able to name and identify the electrical components on a port power equipment, to be able to understand how these components work together for safe operation and to be able to perform basic troubleshooting using a digital multi-meter.

This course covers Electronic Quantities, Circuit connections, different types of circuits, switches and switching concepts, magnetism and electromagnetism, DC power sources, use of Digital Multi-meter functions and circuit diagrams. Hands on testing and troubleshooting performed through use of Lab-Volt's F.A.C.E.T system and Digital Multi-meter with applications in everyday work environment.

### **Power Shop Electric 102 – Length 8 Days**

*Course prerequisites: Power Shop Electric 101.*

This is an intermediate level course covering Electric and Electronic Transmissions, electronic display error code troubleshooting, fault finding utilizing schematics, different components utilized in various transmissions. The objective of this course is for the student to be able to diagnose faults.

This course covers Electric and Electronic Transmissions, electronic display error code troubleshooting , fault finding utilizing schematics, different components utilized in various transmissions (transmission types covered include the Allison WTEC II, Allison WTEC III, Allison 4<sup>th</sup> Gen, Clark-Hurth 28000 – 40000 series, Dana TE and other Electronic transmissions).

### **Power Shop 103 – Length 8 Days**

*Course prerequisites: Power Shop Electric 101 & 102.*

This is an advanced course covering solid-state devices, pulsed width modulation (pwm), symbols used in schematic reading, detailed use of diagrams, practical on-line troubleshooting, inverter rated three-phase motors and drives. The objective of this course is for the student to be able to understand solid-state devices, principles of inverter rated motors and drives. Hands-on labs include fault finding on circuits utilizing the Lab-Volt Training System with test equipment (DC/AC TRMS clamp meter, Digital Multi-Meter, Insulation Tester).

**Courses for Reefer Shop Mechanics**

*Mechanics working on refrigerated containers and gen-set equipment.*

**Refrigerated Container 101 – Length 8 Days**

*Course prerequisites: none.*

This course covers Electrical Circuits and Troubleshooting the Basic Refrigeration Electrical System(s), Refrigeration Cycle, System Components and Functions, System Service Procedures, System Diagnostics, System Vacuum and Recharging, System Troubleshooting and Component Replacement Procedures. The objective of this course is for the student to be able to identify the container refrigeration components, be able to explain how the system works, be able to perform routine service and be able to troubleshoot basic system faults. Each student will receive a DMM meter, manuals and technical documents.

**Refrigerated Container 102 – Length 8 Days**

*Course prerequisites: Refrigerated Container 101.*

This course covers refrigerant flow control, recovery, recycle, recharge, testing procedures via the electronic control system, fault codes and corrective procedures using display panel. The objective of this course is for the student to be able to explain the advanced operation of refrigerant flow controls, be able to perform recovery, recycle & recharge, be able to troubleshoot the electronic control system and explain fault codes & take corrective measures.

**Brazing for Refrigerant tubing – Length 1 Day**

*Course prerequisites: none.*

This course covers the basics on how to handle a torch, prep work for tubing, proper techniques and safety. The objective of this course is for the student to be able to adequately perform brazing using a torch.

**Refrigerated Container Generator – Length 3 Days**

*Course prerequisites: none.*

Overview of components and their functions, diesel engine, cranking system, battery and charging circuits, fuel system, cooling system, 12 v electrical system, diagnostics / troubleshooting / repair process. The objective of this course is for the student to be able to identify the generator components, explain how the system works, troubleshoot the system operation and perform routine maintenance. Equipment includes Carrier and Thermo King.

**Refrigerated Container Generator Controls – Length 2 Days**

*Course prerequisites: Refrigerated Container Generator*

This course covers generator control circuits, sensors, testing using an electrical meter, fault codes, messages and an overview of components and their functions. The objective of this course is for the student to be able to identify the various control components and sensors and be able to perform system troubleshooting using an electrical meter.

**Refrigerant Gas Handling/Recycling & Recovery Certification**

*Any mechanic who handles refrigerant (puts gauges on an AC or reefer unit) must have:*

**608 ACCA Certification – Length 3 Days**

*Course prerequisites: Refrigerated Container 101.*

This course covers the Section 608 Refrigeration Gas review and certification test used in Container Refrigeration, the correct handling procedures for refrigerants, EPA refrigerant recycling and recharging procedures. The objective of this course is for the student to be able to pass the EPA Clean Air Act 608 Certification Exam.

**609 MACS Certification – Length 3 Days**

*Course prerequisites: Refrigerated Container 101.*

This course covers the AC Theory, system components, service procedures, the correct handling procedures for refrigerants, EPA refrigerant recycling and recharging procedures and system diagnostics used in motor vehicle like equipment. The objective of this course is for the student to be able to pass the EPA Clean Air Act 609 Certification Exam.

**Courses for M&R Shop Mechanics**

*Mechanics working on containers and chassis*

**Federal Motor Carrier Safety Administration**

Every motor carrier and intermodal equipment provider must systematically inspect, repair, and maintain or cause to be systematically inspected, repaired, and maintained, all motor vehicles and intermodal equipment subject to its control. Available courses:

**Chassis Air/ABS Brakes & Inspection – Length 8 Days**

*Course prerequisites: none.*

This course covers the chassis electrical system, foundation air & ABS brake system and periodic chassis inspection in accordance with the Department of Transportation Federal Motor Carriers Safety Administration Intermodal Equipment Rules 49 CFR 390, 393 – Parts and Accessories Necessary for Safe Operation, 396 – Inspection, Repair & Maintenance, Appendix G to Subchapter B of Chapter III – Minimum Periodic Inspection Standards, and Appendix B to Part 386 - Penalty Schedule; Violations and Monetary Penalties. Upon successful completion the student will be able to troubleshoot electrical faults, inspect (wheels pulled), service and adjust brakes and perform periodic “annual” FHWA inspections in accordance with the FMCSA rules and regulations. Hands-on shop work includes testing the electrical system, removal and replacing chassis brakes on both non-ABS and ABS chassis, diagnostics of ABS system on ABS chassis, brake adjustment and chassis inspection.

Brake focus includes: the different types, parts, assembly, adjustments, lubrication, seals, bearings, system operation, diagnostics & repairs, diagnostic codes, use of scanners and laptops for diagnostics and safety, proper tools to use during inspection and maintenance. Inspection focus includes: the brake system, lighting system, structural components, tires, rims, lug nuts, fifth wheel, glad hands, air lines, rear impact guard, suspension system and landing gear.

Upon successful completion of this course, a document is provided students’ employers to indicate the student has received training in these areas.

**Annual Chassis Inspection / Brake Inspector for Intermodal Equipment – Length 2 Days**

*Course prerequisites: none.*

This course covers periodic chassis inspection in accordance with the Department of Transportation Federal Motor Carriers Safety Administration Intermodal Equipment Rules 49 CFR 390, 393 – Parts and Accessories Necessary for Safe Operation, 396 – Inspection, Repair & Maintenance, Appendix G to Subchapter B of Chapter III – Minimum Periodic Inspection Standards, and Appendix B to Part 386 - Penalty Schedule; Violations and Monetary Penalties. Hands-on shop work includes performing inspections of chassis brakes (wheels pulled). Upon successful completion of this course, the student will be able to inspect the brakes perform periodic “annual” FHWA inspections in accordance with the FMCSA rules and regulations.

Inspection focus includes: the brake system, lighting system, structural components, tires, rims, lug nuts, fifth wheel, glad hands, air lines, rear impact guard, suspension system and landing gear. Upon successful completion of this course, a document is provided students’ employers to indicate the student has received training in these areas.

**FMCSA Rules & Regulations Update – Length 1 Day**

*Course prerequisites: none.*

This course covers updates to FMCSA Intermodal Equipment Rules. This course is recommended for all previous students who took the above Chassis Air/ABS Brakes & Inspection course between 2005 – 2011 in order to become knowledgeable on the current FMCSA regulations. Upon successful completion of this course, a document is provided students' employers to indicate the student has received training in these areas.

**Container Repair – Length 8-10 Days**

*Course prerequisites: none.*

This course covers the repair procedures for reefer and steel cargo containers. Focus is on welding safety, SMAW, MIG, TIG, Oxy Acetylene and Basic Fabrication Program.

**Courses for TIR Inspectors**

**Federal Motor Carrier Safety Administration**

Every motor carrier and intermodal equipment provider must systematically inspect, repair, and maintain or cause to be systematically inspected, repaired, and maintained, all motor vehicles and intermodal equipment subject to its control. Available courses:

**Intermodal Chassis Out of Service Criteria – Length 1 day**

*Course prerequisites: none.*

This course covers chassis out of service criteria in accordance with the Department of Transportation Federal Motor Carriers Safety Administration Intermodal Equipment Rules 49 CFR 390, 393 – Parts and Accessories Necessary for Safe Operation, 396 – Inspection, Repair & Maintenance, Appendix G to Subchapter B of Chapter III – Minimum Periodic Inspection Standards, and Appendix B to Part 386 - Penalty schedule; violations and monetary penalties. Upon successful completion of this course, the student will be able to perform a systematic “trip” inspection of an intermodal chassis in accordance with FMCSA rules and regulations and perform a “walk around” inspection of primary brake components (wheels not pulled) to identify any out of service conditions. Upon successful completion of this course, a document is provided students’ employers to indicate the student has received training in these areas.

**FMCSA Rules & Regulations Update – Length 1 Day**

*Course prerequisites: none.*

This course covers updates to FMCSA Intermodal Equipment Rules. This course is recommended for all previous students who took the above Chassis Air/ABS Brakes & Inspection or TIR Chassis courses between 2005 – 2011 in order to become knowledgeable on the current FMCSA regulations. Upon successful completion of this course, a document is provided students’ employers to indicate the student has received training in these areas.

**Courses for Facility Maintenance Shop Mechanics**

**Facility Basic Electric – Length 8 Days**

*Course prerequisites: none.*

This course is an entry level course covering electrical working drawings, electrical component types (commercial and industrial), recommended conductor color coding, different types of materials used in commercial / industrial environments (receptacles, switches, breakers, etc). The objective of this course is for the student to understand and perform proper techniques in wiring components and troubleshooting in facility maintenance. Hands on labs include wiring / replacing ballasts, panel circuit breakers, receptacles, GFIC protection, single-pole, three-way, four-way and double pole switches.



### **Courses for Welders**

*Any mechanic who performs welding must be trained on both the safety and technique of welding, after which a welder can be tested/certified as required. Available courses:*

#### **Welding 101 – Length 8 Days**

*Course prerequisites: none.*

This is an entry level course covering lecture and instruction on Welding Principles and Applications, correct operation and handling of different types of welding equipment, welding symbols, metal types and welding procedures. The objective of this course is for the student to understand the proper procedures welding in different positions. The welder has hands-on instruction on proper use of welding electrodes, techniques and welding positions.

#### **Welding 101B – Length 8 Days**

*Course prerequisites: Welding 101.*

This is an intermediate level course covering lecture and instruction on Welding Repair Principles and Techniques. Utilizing different types of welding equipment, welding procedures used for repairs. The objective of this course is for the student to understand the proper procedures utilizing various types of equipment. The welder has hands-on instruction on advanced torch use, air-arc gouging, die and disk grinding techniques for proper preparation to perform task.

#### **Welding 102 – Length 8 Days**

*Course prerequisites: Welding 101.*

This is an advanced level course covering lecture and instruction for the welder to be tested for competency of welding in the Shielded Metal Arc Welding mode for structural steel in all positions, in a thickness range of “zero inches” up to and including one inch thick carbon steel with “stick electrodes”. The objective of this course is for the student to understand the proper procedures welding in all positions with a backing plate. Certification given upon successful completion of the American Welding Society testing procedure – Welding Code, Chapter D1.1.

#### **Welding 103 – Length 8 Days**

*Course prerequisites: Welding 101, 102.*

This is an advanced level course covering lecture and instruction for the welder to be tested for Open-root (welding coupons with NO backing plates, root passed removed and back welded) in the Vertical and Overhead positions according to the AWS D1.5 specifications. The objective of this course is for the student to understand the proper procedures welding in all positions open-root (no backing plate). This would prepare the welder to handle repair work where you have breakage and no way to install a backing plate for the repairs. Certification given upon successful completion of the American Welding Society testing procedure.

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

Below is the list of training areas with regulatory references and selected requirements.

### 1) **Hazardous Training**

- a) Hazardous Communication Training - Globally Harmonized System of Classification and Labeling of Chemicals
  - i) OSHA 29 CFR 1910.1200 – All workers who utilize chemical substances (fuels, lubricants, paints, primers, adhesives, solvents, etc.) to be trained about the hazards present in the chemical they utilize on the job. *Completion of training needed by 12/1/2013.*

### 2) **National Fire Protection Association (NFPA) 70E Standard for Workplace Electrical Safety**

- a) NFPA 70E – The employer shall document that each employee has received the training required by 110.2 (D).
- b) Assists in complying with OSHA 29 CFR 1910.332

### Training

(a) Scope. The training requirements contained in this section apply to employees who face a risk of electric shock that is not reduced to a safe level by the electrical installation requirements of §§1910.303 through 1910.308.

Note: Employees in occupations listed in Table S-4 face such a risk and are required to be trained. Other employees who also may reasonably be expected to face a comparable risk of injury due to electric shock or other electrical hazards must also be trained.

(b) Content of training—(1) Practices addressed in this standard. Employees shall be trained in and familiar with the safety-related work practices required by §§1910.331 through 1910.335 that pertain to their respective job assignments.

(2) Additional requirements for unqualified persons. Employees who are covered by paragraph (a) of this section but who are not qualified persons shall also be trained in and familiar with any electrically related safety practices not specifically addressed by §§1910.331 through 1910.335 but which are necessary for their safety.

(3) Additional requirements for qualified persons. Qualified persons (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

- (i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,
- (ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts, and
- (iii) The clearance distances specified in §1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

Note 1: For the purposes of §§1910.331 through 1910.335, a person must have the training required by paragraph (b)(3) of this section in order to be considered a qualified person.

Note 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet §1910.333(c)(2).

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

(c) Type of training. The training required by this section shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the risk to the employee.

Table S-4—Typical Occupational Categories of Employees Facing a Higher Than Normal Risk of Electrical Accident

### Occupation

Blue collar supervisors.1

Electrical and electronic engineers.1

Electrical and electronic equipment assemblers.1

Electrical and electronic technicians.1

Electricians

Industrial machine operators.1

Material handling equipment operators.1

Mechanics and repairers.1

Painters.1

Riggers and roustabouts.1

Stationary engineers.1

Welders

1 Workers in these groups do not need to be trained if their work or the work of those they supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits operating at 50 volts or more to ground for a hazard to exist.

[55 FR 32016, Aug. 6, 1990]

*c) Effective 2012 - Retraining required every 3 years*

### **3) EPA 608/609 Certifications - Refrigerant Handling/Recycling & Recovery**

a) EPA 40 CFR 82.40 –

82.40 Technician training and certification.

(a) Any technician training and certification program may apply for approval, in accordance with the provisions of this paragraph, by submitting to the Administrator at the address in §82.38(a) verification that the program meets all of the following standards:

(1) Training. Each program must provide adequate training, through one or more of the following means: on-the-job training, training through self-study of instructional material, or on-site training involving instructors, videos or a hands-on demonstration.

(2) Test subject material. The certification tests must adequately and sufficiently cover the following:

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

(i) The standards established for the service and repair of MVACs and MVAC-like appliances as set forth in appendices A, B, C, D, E, and F of this subpart. These standards relate to the recommended service procedures for the containment of refrigerant, extraction equipment, extraction and recycle equipment, and the standard of purity for refrigerant in motor vehicle air conditioners.

(ii) Anticipated future technological developments, such as the introduction of HFC-134a in new motor vehicle air conditioners.

(iii) The environmental consequences of refrigerant release and the adverse effects of stratospheric ozone layer depletion.

(iv) As of August 13, 1992, the requirements imposed by the Administrator under section 609 of the Act.

(3) Test administration. *Completed tests must be graded by an entity or individual who receives no benefit based on the outcome of testing; a fee may be charged for grading. Sufficient measures must be taken at the test site to ensure that tests are completed honestly by each technician.* Each test must provide a means of verifying the identification of the individual taking the test. Programs are encouraged to make provisions for non-English speaking technicians by providing tests in other languages or allowing the use of a translator when taking the test. If a translator is used, the certificate received must indicate that translator assistance was required.

b) EPA 40 CFR 82.161

82.161 Technician certification.

(a) Effective November 14, 1994, technicians, except technicians who successfully completed voluntary certification programs that apply for approval under §82.161(g) by December 9, 1994, must be certified by an approved technician certification program under the requirements of this paragraph (a). Effective May 15, 1995, all technicians must be certified by an approved technician certification program under the requirements of this paragraph (a).

(1) Technicians, as defined in §82.152, who maintain, service, or repair small appliances must be properly certified as Type I technicians.

(2) Technicians who maintain, service, or repair medium-, high-, or very high-pressure appliances, except small appliances, MVACs, and MVAC-like appliances, or dispose of medium-, high-, or very high-pressure appliances, except small appliances, MVACs, and MVAC-like appliances, must be properly certified as Type II technicians.

(3) Technicians who maintain, service, or repair low-pressure appliances or dispose of low-pressure appliances must be properly certified as Type III technicians.

(4) Technicians who maintain, service, or repair low- and high-pressure equipment as described in §82.161(a) (1), (2) and (3) must be properly certified as Universal technicians.

(5) Technicians who maintain, service, or repair MVAC-like appliances must either be properly certified as Type II technicians or complete the training and certification test offered by a training and certification program approved under §82.40.

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

### 4) Rigging

Although there are no known specific personnel training requirements for rigging in the maintenance area, there are several regulations covering the selection, use and maintenance of slings and in the recognition of hazards associated with their use. These are listed below with selected language shown as reference:

- a) ASME B30.9, B30.26
- b) ANSI A10.42-2000
- c) OSHA 29 CFR 1910.184

#### Slings

(a) Scope. This section applies to slings used in conjunction with other material handling equipment for the movement of material by hoisting, in employments covered by this part. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

(d) Inspections. Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

- d) OSHA 29 CFR 1910.179 overhead/gantry cranes
- e) OSHA 29 CFR 1917.13 marine terminals
- f) OSHA 29 CFR 1926.1400, .1404, .1425, .1430

### 5) Power Industrial Truck

- a) OSHA 29 CFR 1910.178 (l)

(l) Operator training.

(1) Safe operation. (i) The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (l).

(ii) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (l), except as permitted by paragraph (l)(5).

(2) Training program implementation. (i) Trainees may operate a powered industrial truck only:

(A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

(B) Where such operation does not endanger the trainee or other employees.

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

(ii) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

(iii) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

(4) Refresher training and evaluation. (i) Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (l)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

(ii) Refresher training in relevant topics shall be provided to the operator when:

(A) The operator has been observed to operate the vehicle in an unsafe manner;

(B) The operator has been involved in an accident or near-miss incident;

(C) The operator has received an evaluation that reveals that the operator is not operating the truck safely;

(D) The operator is assigned to drive a different type of truck; or

(E) A condition in the workplace changes in a manner that could affect safe operation of the truck.

(iii) An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

### 6) **Dept. of Transportation FMCSA Annual Chassis Inspection, Brake Inspection & Brake Repair**

a) DOT 49 CFR 390

b) DOT 49 CFR 393

c) DOT 49 CFR 396

396.19 Inspector qualifications.

(a) Motor carriers and intermodal equipment providers must ensure that individuals performing annual inspections under §396.17(d) or (e) are qualified as follows:

(1) Understand the inspection criteria set forth in part 393 and appendix G of this subchapter and can identify defective components;

(2) Are knowledgeable of and have mastered the methods, procedures, tools and equipment used when performing an inspection; and

(3) Are capable of performing an inspection by reason of experience, training, or both as follows:

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

- (i) Successfully completed a Federal-or State-sponsored training program or have a certificate from a State or Canadian Province that qualifies the individuals to perform commercial motor vehicle safety inspections, or
- (ii) Have a combination of training or experience totaling at least 1 year. Such training or experience may consist of:
  - (A) Participation in a commercial motor vehicle manufacturer-sponsored training program or similar commercial training program designed to train students in commercial motor vehicle operation and maintenance;
  - (B) Experience as a mechanic or inspector in a motor carrier or intermodal equipment maintenance program;
  - (C) Experience as a mechanic or inspector in commercial motor vehicle maintenance at a commercial garage, fleet leasing company, or similar facility; or
  - (D) Experience as a commercial motor vehicle inspector for a State, Provincial or Federal government.
- (b) Motor carriers and intermodal equipment providers must retain evidence of that individual's qualifications under this section. They must retain this evidence for the period during which that individual is performing annual motor vehicle inspections for the motor carrier or intermodal equipment provider, and for one year thereafter. However, motor carriers and intermodal equipment providers do not have to maintain documentation of inspector qualifications for those inspections performed either as part of a State periodic inspection program or at the roadside as part of a random roadside inspection program.

### 396.25 Qualifications of brake inspectors.

- (a) Motor carriers and intermodal equipment providers must ensure that all inspections, maintenance, repairs or service to the brakes of its commercial motor vehicles, are performed in compliance with the requirements of this section.
- (b) For purposes of this section, brake inspector means any employee of a motor carrier or intermodal equipment provider who is responsible for ensuring that all brake inspections, maintenance, service, or repairs to any commercial motor vehicle, subject to the motor carrier's or intermodal equipment provider's control, meet the applicable Federal standards.
- (c) No motor carrier or intermodal equipment provider may require or permit any employee who does not meet the minimum brake inspector qualifications of paragraph (d) of this section to be responsible for the inspection, maintenance, service or repairs of any brakes on its commercial motor vehicles.
- (d) The motor carrier or intermodal equipment provider must ensure that each brake inspector is qualified as follows:
  - (1) Understands the brake service or inspection task to be accomplished and can perform that task; and
  - (2) Is knowledgeable of and has mastered the methods, procedures, tools and equipment used when performing an assigned brake service or inspection task; and

## Recommended/Required Training Areas – Regulatory References & Selected Requirements

(3) Is capable of performing the assigned brake service or inspection by reason of experience, training, or both as follows:

(i) Has successfully completed an apprenticeship program sponsored by a State, a Canadian Province, a Federal agency or a labor union, or a training program approved by a State, Provincial or Federal agency, or has a certificate from a State or Canadian Province that qualifies the person to perform the assigned brake service or inspection task (including passage of Commercial Driver's License air brake tests in the case of a brake inspection); or

(ii) Has brake-related training or experience or a combination thereof totaling at least one year. Such training or experience may consist of:

(A) Participation in a training program sponsored by a brake or vehicle manufacturer or similar commercial training program designed to train students in brake maintenance or inspection similar to the assigned brake service or inspection tasks; or

(B) Experience performing brake maintenance or inspection similar to the assigned brake service or inspection task in a motor carrier or intermodal equipment provider maintenance program; or

(C) Experience performing brake maintenance or inspection similar to the assigned brake service or inspection task at a commercial garage, fleet leasing company, or similar facility.

(e) No motor carrier or intermodal equipment provider may employ any person as a brake inspector unless the evidence of the inspector's qualifications, required under this section, is maintained by the motor carrier or intermodal equipment provider at its principal place of business, or at the location at which the brake inspector is employed. The evidence must be maintained for the period during which the brake inspector is employed in that capacity and for one year thereafter. However, motor carriers and intermodal equipment providers do not have to maintain evidence of qualifications to inspect air brake systems for such inspections performed by persons who have passed the air brake knowledge and skills test for a Commercial Driver's License.

### 7) Certificate of Fitness for Safe Handling of Oxygen & Acetylene

Applicable to all mechanics who handle a torch for welding, cutting, burning.

- a) NYC fire dept. regulation NYFD G-60 (old G95)
- b) 2009 NFPA 51B – standard for i. preventing injury, loss of life, loss of property, and ii. fire prevention during welding, cutting and other hot work
- c) OSHA 29 CFR 1917.152
- d) OSHA 29 CFR 1910.134 - Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations; Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance;
- e) OSHA 29 CFR 1910.252 - Cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process
- f) OSHA 29 CFR 1910.253 - Workmen in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent by their employers for this important work before being left in charge.
- g) US Coast Guard general welding permit – All persons using any cutting, welding, or other hot-work equipment shall be fully qualified in its use and associated safety procedures. All safe practices in NFPA 51B shall be observed.



## Recommended/Required Training Areas – Regulatory References & Selected Requirements

- h) ANSI Z49.1 – Training. Persons exposed to welding hazards shall be trained in the use of, and understand the reasons for, protective clothing and equipment.

### 8) Welding

Welding requires training on both safety and technique, after which a welder can be certified as required. In general OSHA requires that employers train their employees regarding the hazards of their job. Common subjects to cover regarding welding safety include: personal protective equipment (helmet, gloves, apron, etc.), fumes, and fire safety. If you are welding as part of your job, then your employer should provide training about that task.

- a) OSHA 29 CFR 1910.252 - Cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process
- b) OSHA 29 CFR 1910.254 - Workmen designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment as specified in paragraph (d) of this section.
- c) OSHA 29 CFR 1917.152
- d) DOT and OEM's require welding to be in accordance with AWS D1.1 code for structural carbon & low alloy steel
- e) PANYNJ welding permit - Only experienced, trained, and qualified welders or operators shall be used, and all personnel shall be trained in emergency procedures and use of fire extinguishers
- f) US Coast Guard general welding permit – All persons using any cutting, welding, or other hot-work equipment shall be fully qualified in its use and associated safety procedures. All safe practices in NFPA 51B shall be observed.
- g) OSHA 29 CFR 1926.32 (I) - Qualified means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- h) ANSI Z49.1 – Training. Persons exposed to welding hazards shall be trained in the use of, and understand the reasons for, protective clothing and equipment.