

POWERLINE SYSTEMS (90 Hours)

Course No.: 79-85-53

COMPETENCY CHECKLIST

Student Name _____

Teacher Name _____ School Site _____

Start Date _____ Completion Date _____ Certificate Date _____

Teacher Signature _____ Student Signature _____

(Signatures verify completion of course competencies)

A. ORIENTATION, SAFETY AND PHYSICAL FITNESS

(10 hrs)

- _____ 1. Hazards in electrical powerline work
- _____ 2. Listed items to minimize accidents
- _____ 3. Contributing factors to work accidents
- _____ 4. Proper use of tools and equipment
- _____ 5. Proper clothing for the job
- _____ 6. Pass safety exam with 100%
- _____ 7. Importance of good communication
- _____ 8. Participate in Powerline Athlete Program

B. APPLIED MATHEMATICS (10 hrs)

- _____ 1. Metric system as it applies to line work
- _____ 2. Decimal system as it applies to line work
- _____ 3. Fractional system as it applies to line work
- _____ 4. Solve basic math problems in listed areas
- _____ 5. Transpose three element formulas
- _____ 6. Solve problems using 3 element formulas
- _____ 7. Solve problems using powers of ten

C. BASIC ELECTRICAL CONCEPTS (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. List five sources of electricity
- _____ 3. Operation of a simple battery or cell
- _____ 4. Polarity as it applies to batteries
- _____ 5. Properties of direct current circuit
- _____ 6. Conductors, cables, and insulators
- _____ 7. Electron structure of conductors/insulators
- _____ 8. List magnetic and nonmagnetic metals
- _____ 9. Relation between magnetism & electricity
- _____ 10. Draw diagram of generator & listed items

D. OHM'S LAW (15 hrs)

- _____ 1. Define listed terms related to topic

- _____ 2. List other names for voltage
- _____ 3. List other names for current flow
- _____ 4. Describe various forms of resistance
- _____ 5. Describe *work* as it relates to Ohm's law
- _____ 6. Five elements in practical electrical circuits
- _____ 7. Draw simple circuit illustrating Ohm's law
- _____ 8. Solve various Ohm's law problems
- _____ 9. Describe effects of electrical power
- _____ 10. Features of a simple series circuit
- _____ 11. Draw a simple series circuit
- _____ 12. Rules for current & voltage in series circuits
- _____ 13. Features of a parallel circuit
- _____ 14. Draw a simple parallel circuit
- _____ 15. Rules for voltage & current in parallel circuit
- _____ 16. Differentiate among listed circuits
- _____ 17. Reduce series-parallel circuits to simplest form
- _____ 18. Solve problems with series-parallel circuits
- _____ 19. Common wire sizes used in electrical trade
- _____ 20. Compare numerical size & physical size of wire
- _____ 21. Common types of insulation used in trade

E. ALTERNATING CURRENT THEORY (20 hrs)

- _____ 1. Define terms related to topic of AC theory
- _____ 2. Generation of alternating current
- _____ 3. Delta electrical versus wye electrical systems
- _____ 4. Rules of magnetism & electricity to sine wave
- _____ 5. Values of RMS and peak voltage of currents
- _____ 6. Describe listed systems and their generation
- _____ 7. Differentiate among listed power systems
- _____ 8. Units of measure for inductance
- _____ 9. Describe transformer action
- _____ 10. Compare listed ratios
- _____ 11. General rules for transformer operation

- ___ 12. Features of listed transformers
- ___ 13. Operating conditions for transformer
- ___ 14. Compare transformer input/output
- ___ 15. Efficiency of transformers
- ___ 16. Nameplate info on transformers
- ___ 17. Calculate input and output current
- ___ 18. Parts of capacitors
- ___ 19. Construction of capacitors
- ___ 20. Reasons to reduce power factor
- ___ 21. Two methods of reducing power factor

F. POWERLINE SYSTEM (10 hrs)

- ___ 1. Basic structure of utilities power system
- ___ 2. Receiving stations vs. distributions stations
- ___ 3. Conductors use in distribution system
- ___ 4. Function of distribution transformer

G. RIGGING (10 hrs)

- ___ 1. Define listed items based on rope type
- ___ 2. Use/care of synthetic ropes & steel slings
- ___ 3. Demo listed knots
- ___ 4. Identify types of sheaves uses in rigging
- ___ 5. Proper 'block size to rope size' ratio
- ___ 6. Demo 'hand-line' operation & preparation
- ___ 7. Calculate mechanical advantage problems
- ___ 8. Identify rigging w/use of A-frame gin

H. EMPLOYABILITY SKILLS (5 hrs)

- ___ 1. Industry standards for employment
- ___ 2. Job specifics for various positions
- ___ 3. Sources for employment information
- ___ 4. Describe working conditions and pay scales
- ___ 5. Prepare cover letter and résumé
- ___ 6. Complete application forms
- ___ 7. Role-play basic interview skills
- ___ 8. Describe work habit required to hold a job