The information contained in this Appendix is a summary of the technical requirements of Safety Code 11. This summary is provided for convenience only and cannot be relied on in lieu of the actual safety standards.

# APPENDIX D TO CODE 11 - SUMMARY OF 29 C.F.R. §1910.269 ELECTRIC POWER GENERATION, TRANSMISSION, AND DISTRIBUTION

(a) Application.

This section covers the operation and maintenance (repair) of electric power generation, control, transformation, transmission, and distribution lines and equipment.

Employees shall be trained in safety related work practices. The employer must certify that each employee has received their training.

(b) Medical services and first aid. G95

A suitable number of employees need to be trained in first aid and CPR when work is being performed on energized lines of 50 volts or more.

(c) Job briefing.

Job briefing will be conducted before the start of each job and before any significant changes occur during the job.

(d) Hazardous energy control.

A lockout-tagout program must be developed and implemented by the company. All affected employees must be trained on these procedures and the employer must certify this training.

(e) Enclosed spaces.

The employer must ensure the use of safe work practices during all enclosed space entries. All affected employees must be trained in enclosed space entry.

(f) Excavations.

A competent person must be in charge of all excavation work to insure safety for employees.

(g) Personal protective equipment (PPE).

PPE must be suitable for the task to be performed. The employer must perform an evaluation of each employee's job and provide adequate PPE.

(h) Ladders and platforms.

Ladders and platforms must be secured in place and not overloaded. Conductive ladders may not be used

near exposed energized lines except under special conditions.

(i) Hand and portable tools.

Cord and plug electrical equipment must be properly grounded or be of the double insulated type. All pneumatic and hydraulic tools shall be used in accordance with the manufacturer's instructions. Quick acting, self-closing connectors are recommended for attaching tools to air hoses.

### (J) Live line tools.

Live line tools must be properly maintained to prevent contamination and maintain mechanical integrity of the tool.

#### (k) Materials storage and handling.

Construction or other type materials may not be stored in the area of exposed energized lines or equipment parts.

(1) Working on or near exposed energized parts.

Only qualified employees may work on or with exposed energized lines or parts of equipment. At least two qualified employees shall be present while the following types of work are performed:

- 1. Work on lines of 600 volts or more.
- 2. Work on deenergized lines if adjacent lines are more than 600 volts,
- 3. Work on transformers, capacitors or regulators when exposed to more than 600 volts,

4. Work involving the use of mechanical equipment that can be energized and when exposed to 600 volts or more.

Clothing made from acetate, nylon, polyester, or rayon is prohibited for use by employees exposed to flames or electric arcs. Suitable tools and PPE must be worn by employees when handling fuses. (m) Deenergizing lines and equipment.

A system operator or a designated employee shall be in charge of clearance while a crew is energizing or deenergizing lines or equipment.

#### (n) Grounding for the protection of employees.

Before employees can work lines or equipment as deenergized, the provisions of 1910.269 (m)(3) must be followed. If the employer decides to not install ground sets, then additional requirements such as assuring that contact with other electrical sources is prevented and no induced voltage is possible. Before grounds are installed, all lines and equipment shall be tested for the presence of voltage.

### (o) Testing.

Safe work practices shall be followed for high voltage and high power testing performed in laboratories, shops, substations, and in the field on electric transmission lines and equipment. Safety practices governing employee work at temporary or field test areas shall provide for a routine check of such test areas for safety at the beginning of each series of tests.

## (p) Mechanical equipment.

All mechanical elevating and rotating equipment shall receive a thorough visual inspection before use on each shift. All vehicular equipment when operated in reverse shall be equipped with backup alarms or be directed by a signal person. All rubber tired equipment must be equipped with rollover protective structures. A designated employee other than the operator shall observe the approach distance of mechanical equipment to exposed, energized power lines and equipment. Mechanical equipment used to lift materials shall not be overloaded.

#### (q) Overhead lines.

All overhead work places shall be evaluated and determined as safe before work is started. All holes for poles or other excavations must be covered, guarded by a barrier or have an attendant to prevent employees from stepping or falling into the holes. Tension stringing methods, barriers or other equivalent measures must be used to protect employees from high voltage.

Ground sets must be used where necessary to protect employees or lines must be worked as if energized when installing or removing overhead lines. Before employees are allowed to perform live-line bare-hand work, they must be properly trained in live-line bare-hand handling techniques.

#### (r) Line-clearance tree trimming.

Before work is started on tree trimming operations an evaluation must be conducted to determine how the work can be performed safely. All employees performing tree trimming will be trained in the special hazards related to this type of work. Employees need training and a safe place to work from such as a platform with guardrails or a platform with a safety harness and lanyard when working with sprayers and related equipment.

All power saws shall be operated in a safe manner. All backpack power units shall be equipped with a quick shutoff switch readily accessible to the operator. Each employee shall be tied in with climbing rope and safety saddle when working in trees.

### (s) Communication facilities.

Microwave antennas shall be located or arranged so employees cannot be injured by the transmission of microwaves. Radiation warning signs and hazard warning instructions shall be posted in prominent locations to warn employees of radiation hazards.

### (t) Underground electrical.

A suitable ladder or other safe climbing device shall be used to enter or exit a manhole or subsurface vault. While work is being performed in a manhole where energized electric equipment is located, an attendant properly trained in first aid and CPR will be available at all times on the surface.

When multiple cables are present in subsurface vaults, the cable to be worked shall be identified by electrical means, unless its identity is obvious.

#### (u) Substations.

Sufficient access and working space shall be provided and maintained around electrical equipment. Conductive fences around substations shall be grounded. Guards need to be provided around all live electrical parts of more than 150 volts to ground that do not have an insulating covering. When guards are removed from energized equipment, barriers shall be installed to protect any employees that are not working

### directly on the energized equipment.

### (v) Power generation.

All interlocks and other safety devices shall be maintained in a safe and operable condition. Signs warning unqualified persons to keep out shall be displayed at entrances to rooms containing electric supply equipment. Entrances to rooms and spaces containing electric supply equipment that are not under the observation of an attendant shall be kept locked.

Eye protection or full face protection shall be worn when condenser, heater or boiler tubes are being cleaned. Areas where chemical cleaning of boilers or pressure vessels is in progress shall be cordoned off to restrict access and signs restricting entry and warning of hazards shall be posted. Chlorine system enclosures must be posted with warning signs. Signs shall warn employees of health as well as fire and explosion hazards.

### (w) Special conditions.

Before employees work on capacitors, the capacitors shall be disconnected from energy sources and, after a wait of at least five minutes, proceed with caution to short circuit them.

Sufficient illumination needs to be provided to enable employees to work safely on electric lines or equipment.

Whenever employees are exposed to the hazard of drowning, they need to wear US Coast Guard approved flotation devices. An employee may cross streams or bodies of water only if safe passage is provided, such as a bridge.

Employees working in the vicinity of vehicular traffic need to be protected from danger by suitable traffic control signs or devices.

# TABLE 1. ELECTRICAL SAFETY-RELATED WORK PRACTICES IN **SECTION 1910.269**

Compliance with subpart S is considered	Paragraphs that apply regardless of compliance
as compliance with §1910.269	with subpart S
(d) electric shock hazards only	$(a)(2)^2$ and $(a)(3)^2$ .
(h)(3)	$(b)^{2}$ .
(i)(2)	$(c)^{2}$ .
(k)	(d), other than electric shock hazards.
(I)(1) thru (I)(4), (I)(6)(i), and (I)(8) thru (I)(10)	(e).
(m)	(f).
(p)(4)	(g).
(s)(2)	(h)(l) and (h)(2).
(u)(1) and $(u)(3)$ thru $(u)(5)$	$(i)(3)^2$ and $(i)(4)^2$ .
(v)(3) through $(v)(5)$	$(j)^2$ .
(w)(1) and (W)(7)	$(1)(5)^2$ , (1)(6)(iii) <sup>2</sup> , and (1)(7) <sup>2</sup> .
	$(n)^2$ .
	$(o)^2$ .
	(p)(1) through $(p)(3)$ .
	$(q)^2$ .
	(r).
	(s)(1).
	$(t)^{2}$
	$(u)(2)^2$ and $(u)(6)^2$ .
	$(v)(1)$ , $(v)(2)^2$ , and $(v)(6)$ through $(v)(12)$ .
	$(w)(2)$ through $(w)(6)^2$ $(w)(8)$ and $(w)(9)^2$

<sup>1</sup>If the electrical installation meets the requirements of §§1910.332 through 1910.308 of this Part, then the electrical installation and any associated electrical safety-related work practices conforming to §§1910.332 through 1910.335 of this Part are considered to comply with these provisions of §1910.269 of this Part. <sup>2</sup>These provisions include electrical safety requirements that must be met regardless of

compliance with Subpart S of this Part.

Appendix A-1 to Section 1910.269--Application of Section 1910.269 and Subpart S of this Part to Electrical Installations.



<sup>1</sup>Electrical installation design requirements only. See Appendix A-2 of this section for electrical safety-related work practices. Supplementary electric generating equipment that is used to supply a workplace for emergency, standby, or similar purposes only is not considered to be an electric power generation installation.

<sup>2</sup>See Table 1 of Appendix A-2 of this section for requirements that can be met through compliance with subpart S of this part.

Appendix A-2 to Section 1910.269--Application of Section 1910.269 and Subpart S of this Part to Electrical Safety-Related Work Practices.



<sup>1</sup>Commingled to the extent that the electric power generation, transmission, or distribution installation poses the greater hazard.

Appendix A-3 to Section 1910.269--Application of Section 1910.269 and Subpart S of



<sup>1</sup>10 feet plus 4 inches for every 10 kilovolts over 50 kilovolts.

Appendix A-4 to Section 1910.269--Application of Section 1910.147, Section 1910.269 and Section 1910.333 to Hazardous Energy Control Procedures (Lockout/Tagout).



<sup>1</sup>If the installation conforms to §§1910.303 through 1910.308 of this part, the lockout and tagging procedures of §1910.333(b) of this part may be followed for electric shock hazards.

<sup>2</sup>Commingled to the extent that the electric power generation, transmission, or distribution installation poses the greater hazard.

<sup>3</sup>Section 1910.333(b)(2)(iii)(D) and (b)(2)(iv)(B) of this part still apply.

Appendix A-5 to Section 1910.269--Application of Section 1910.146 and Section 1910.269 to Permit-Required Confined Spaces.



<sup>1</sup>See §1910.146(c) for general non-entry requirements that apply to all confined spaces.