About this document

Scope

Document requirements for establishing electrically safe work conditions with risk elimination being the top priority in the implementation of safety-related work practices for all employees and contractors at COPA facilities while:

1. performing work within the limited approach boundary OR
2. interacting with equipment where conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to and arc flash hazard exists

The Electrical Safety Program is not a standalone document. It is intended to be used in conjunction with requirements of:

- NFPA 70E – Standard for Electrical Safety in the Workplace
- Alaska Safety Handbook
- COPA Energy Isolation Procedure Execution Standard

Training Requirements

Training levels

There are multiple levels of training regarding electrical safety.

Unqualified Person	Qualified Person

• Craft workers must be familiar with safe work practices
• Unqualified/Level I Training - electrical awareness and hazards of electrical equipment operating at ≥50V.
• Minimum of Initial & every 3 years
	• Qualified/Level II Training
	• Qualified/Level III Training
	  ○ Level IIIa Utility
	  ○ Level IIIb Premise wiring
	• Level IV
	• Contact Release Training
	• Battery Training
	• Capacitor Training

Qualified Person

Qualified Person: One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received NFPA 70E and safety training to identify the hazards and reduce the associated risk.

Such persons will be familiar with the proper use of special precautionary techniques, personal protective equipment (PPE), insulating and shielding materials, and insulated tools and test equipment. A person can be considered qualified with respect to certain electrical equipment and methods, but still is unqualified for others.

Qualified persons will be proficient in the decision-making process necessary to determine the following:

- Perform the job safety planning,
- Identity electrical hazards,
- Assess the associated risk,
- Select the appropriate risk control method, including personal protective equipment.

NOTE: A worker who is undergoing on-the-job training and who in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, will be considered to be a qualified person for the performance of those duties.

Qualified/Level II Training

Qualified/Level II training is for workers who have moderate electrical exposure, including: operators, supervisors, instrument technicians, mechanics and electrical technicians, electrical as-builters, safety specialists, welders, and telecom workers.

Training will cover topics such as: understanding electrical hazards, limits of approach to energized parts, PPE, test equipment/tools, and safe work practices and procedures for locking out equipment.

NOTE: one-time class training with an annual recertification for demonstrating proficiency in safe work practices.

Qualified/Level III Training

Qualified/Level III training is required for Electrician Journeymen, Power Lineman Journeymen, and Residential Wiremen, that work on or near exposed energized industrial electrical equipment.

Workers must be trained to select test instruments and demonstrate how to verify the absence of voltage. The training must enable the worker to understand limitations of each test instrument that might be used.

COPA electricians are required to have both Level IIIa and Level IIIb training. Electricians not having the required training will be allowed to work with qualified electricians.

All practicing journeymen, wiremen, and linemen working at COPA facilities will have a Certificate of Fitness from the State of Alaska.

Level IIIa Utility

Level IIIa Utility training covers power generation, transmission and distribution (the application of OSHA 1910.269 and 1926.950-960 Subpart V).

NOTE: one-time class training with an annual recertification for demonstrating proficiency in safe work practices by the Lead Electrician and signed off by the Supervisor.

Level IIIb Premise wiring

Level IIIb Premise wiring covers all other non-utility work (application of OSHA 1910 Subpart S 301 through 399).

NOTE: one-time class training with an annual recertification for demonstrating proficiency in safe work practices by the Lead Electrician and signed off by the Supervisor.

Level IV training

Level IV training includes Power Line Workers or Linemen (application of OSHA 1910.269 and 1926.950-960 Subpart V). In addition, they must have special training for the work they are performing, i.e., Pole Top and/or Bucket Rescue.

> **NOTE:** one-time class training with an annual recertification for demonstrating proficiency in safe work practices by the Lead Electrician and signed off by the Supervisor.

Contact Release Training

Contact Release Training for electricians and linemen.

> **NOTE:** one-time class training with an annual refresher course.

NFPA 70E training

Training in electrical safe work practices that include hazard assessment, risk management, personal protective equipment, and safe work procedures.

> **NOTE:** one-time initial course with a triennial 16-hour NFPA 70E Changes/Refresher for qualified workers.

Requirements for retraining

Retraining in NFPA 70E and the NEC must be performed at intervals not to exceed three years. A worker must receive additional training (or retraining) when:

- A worker is found to not comply with safety-related work practices
- New equipment, PPE, or new technology is introduced to work
- New or revised procedures are used
- A worker is scheduled for a task that is performed less often than once per year
- A worker is scheduled for a task not associated with regular job duties

Roles and Responsibilities

All workers who work around electrical sources or electrical equipment	All workers who work around electrical sources or electrical equipment must: • **Understand** and **adhere** to the requirements set forth in this document • **Recognize** what work they can perform and what work they may not perform under this procedure • **Follow** Electrical Hazards and Requirements of the Alaska Safety Handbook • **Report** errors and near-misses
Electrically Qualified Personnel	Electrically qualified personnel (e.g., Electricians: Construction and Maintenance, Electrical Engineers, Instrument Engineers, Instrument Technicians, Vendor Service Representatives, Electrical Administrator) must: • **Understand** and **adhere** to the requirements set forth in this document • **Understand** and **adhere** to the requirements of the current version of NFPA 70E • **Ensure** Electrical Energy Isolation Procedure (E-EIP) Form is completed and followed for all applicable work • **Utilize** proper personal protective equipment (PPE) appropriate to the assigned task • **Apply** LOTO to electrical circuits
Unqualified Personnel	Unqualified Personnel (e.g., crafts personnel, including but not limited to: Insulators, Equipment Operators, Roustabouts, Mechanics, Scaffolders, Welders etc.) must: • **Understand** and **adhere** to the requirements set forth in this document • **Recognize** what work they can and what work they may not perform under this procedure
Operators	Operators must: • **Follow** Electrical Hazards and Requirements of the Alaska Safety Handbook • **Receive** training before performing LOTO on electrical equipment in preparation of work on non-electrical equipment • **Inspect** above-ground cables for issues during their daily rounds

Safety and Health Specialists

Safety and Health Specialists must:

- **Follow** Electrical Hazards and Requirements of the Alaska Safety Handbook
- **Perform** and **maintain** records of the following audits using requirements in section 9 of the COPA Energy Isolation Procedure Execution Standard and utilizing a Qualified Person as part of the audit when necessary:

Audit Type	Audit Cycle
Electrical Safety Program Audit	Every 3 years
Field work using Electrical Safety Audit Verification form to verify that the requirements contained in the electrical safety program are being followed	Annual
LOTO Program, Procedure, training, and worker execution	Annual

- **Document** and **retain** audits per company Document Retention Management requirements

Maintenance Supervisors

Maintenance Supervisors must:

- **Follow** Electrical Hazards and Requirements of the Alaska Safety Handbook
- **Provide** final approval authority over energized work permit

Field Electrical Engineers

Field Electrical Engineers must:

- **Perform** triennial updates to this program
- **Perform** arc flash calculations
- **Ensure** arc flash information is readily available

Electrical Safe Work Requirements

Electrically Safe Work Condition

Policy	Every electrical conductor or circuit part must be considered energized until proved otherwise. Energized electrical conductors and circuit parts operating at voltages ≥50V must be placed into an electrically safe work condition before an employee performs work if any of the following conditions exist: • The employee is within the limited approach boundary • The employee interacts with equipment where conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists It is imperative to utilize hazard risk elimination as the first priority for each task

Process for establishing and Verifying an Electrical Safe Work Condition

An electrically safe work condition will be established and verified at each point of work by the following process:

Step	Action
1.	**Determine** all possible sources of electrical supply to the specific equipment. **Check** applicable up-to-date drawings, diagrams, and identification tags.
2.	**Ascertain** what other equipment, if any will be affected by disconnecting electrical power sources to the specific equipment.
3.	After properly stopping the equipment, **open** the disconnecting device(s) for each source of power and **try to start** the equipment to determine that it has been de-energized.
4.	Where possible, visually **verify** that all blades of the disconnecting devices are fully open, or that draw-out type circuit breakers are withdrawn to the fully disconnected position.
5.	**Release** stored electrical energy
6.	**Block** or **relieve** stored nonelectrical energy in devices to the extent the circuit parts cannot be unintentionally energized by such devices.
7.	**Apply** lockout/tagout devices in accordance with a documented and established policy.
8.	**Test** each connector or circuit part with an adequately rated voltage detector at each point of work to verify absence of voltage. Before and after each test, **determine** that the voltage detector is operating correctly by testing on a known energized source.
9.	Where the possibility of induced voltages or stored electrical energy exists, **ground** the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, **apply** ground connecting devices rated for the available short circuit duty.

Electrical Safe Work Practices

Incident Energy Analysis Method	The incident energy exposure level is based on the working distance of the employee's face and chest areas from a prospective arc source for the specific task to be performed.
Equipment labeling	Electrical equipment that is likely to require examination, adjustment, servicing, or maintenance while energized must be field marked with a label containing the following information: • Nominal system voltage • Arc flash boundary • Available incident energy and corresponding working distance **CAUTION:** If equipment is missing such arc flash label or equipment is powered by an alternate power source such as a portable generator or E bus, **contact** COPA Field Electrical Engineer for guidance.
Approaching live parts	No qualified person will approach or take any conductive object closer to live parts than the restricted approach boundary unless: • The qualified person is insulated or guarded from the live parts by using voltage rated tools and/or PPE, and no uninsulated part of the qualified person's body enters the restricted space set forth in NFPA approach boundaries, or • The live part is insulated from the qualified person and from any other conductive object at a different potential, or • The qualified person is insulated from any other conductive object as during live-line bare-hand work.
Unqualified Persons Approach to Live Parts	Unqualified persons will not be permitted to enter the limited approach boundary of a conductor energized at ≥50V even if accompanied by a qualified person. Where unqualified person(s) is (are) working at or close to the limited approach boundary, the electrically qualified worker in charge of the work space where the electrical hazard exists must cooperate with the designated person in charge of the unqualified person(s) to ensure that all work can be done safely. This will include advising the unqualified person(s) of the electrical hazards and warning him or her to stay outside of the limited approach boundary.

Uninsulated and Energized Overhead Conductors

Where work is performed in locations containing uninsulated, energized overhead conductors that are not guarded or isolated, precautions must be taken to prevent workers from contacting such lines directly with any unguarded parts of their body or indirectly through conductive materials, tools, or equipment.

If	Then
Work to be performed is such that contact with uninsulated, energized overhead lines is possible	The lines must be: • de-energized and • visibly grounded at the point of work or suitably guarded.

De-energizing or Guarding lines

If the lines are to be de-energized, arrangements must be made with the COPA Facility Electrician that operates or controls the lines to de-energize them and visibly ground them at the point of work.

If arrangements are made to use protective measures, such as guarding, isolating, or insulation, these precautions must prevent each worker from contacting such lines directly with any part of his or her body, or indirectly through conductive materials, tools, or equipment.

Approach Distances for Unqualified Persons

When personnel without electrical training are working on the ground or in an elevated position near overhead lines, the location will be such that the worker and the longest conductive object the worker might use cannot come closer than 15 feet to any unguarded, energized overhead power line.

Conductive Materials, Tools, and Equipment Being Handled Near Live Equipment

Conductive materials, tools, and equipment that are in contact with any part of a worker's body must be handled in a manner that will prevent accidental contact with conductors energized at ≥50V.

Means must be employed by qualified persons to ensure that conductive materials approach live parts no closer than the limited approach boundary.

Insulated Tools and Equipment

Only qualified workers will use insulated tools and/or handling equipment when working inside the limited approach boundary of live parts where tools or handling equipment might make accidental contact. Insulated tools will be protected from damage to the insulating material.

- Fuse or fuse holder handling equipment, insulated for the circuit voltage, must be used to remove or install a fuse if the fuse terminals are energized.
- Ropes and hand lines used near live parts must be nonconductive.

Safety Interlocks

Only a qualified person working inside the restricted approach boundary may defeat or bypass an electrical safety interlock over which the qualified person has sole control, and only temporarily while the qualified person is working on the equipment.

The safety interlock system must be returned to its operable condition when the work is completed.

Portable Ladders

Portable ladders must have nonconductive side rails if used where the worker or the ladder could contact live parts.

Protective shields

Protective shields, protective barriers, or insulating materials must be used to protect workers in the following scenarios:

If	Then
Working near conductors energized at ≥50V which might be accidentally contacted or where dangerous electric heating or arcing might occur	**Use** protective shields, protective barriers, or insulating materials to protect each worker from electrical-related injuries
Normally enclosed conductors energized at ≥50V are exposed for maintenance or repair	**Guard** conductors to protect unqualified persons from contact
Working in confined or enclosed spaces (such as a manhole or vault) that contain live parts	**Use** protective shields, protective barriers, or insulating materials, as necessary, to avoid inadvertent contact with these parts. Doors, hinged panels, etc. must also be secured to prevent swinging into a worker and causing worker to contact live parts.

Overcurrent Protection Modification

Overcurrent protection of circuits and conductors must not be modified, even on a temporary basis, without approval from the:

- COPA Field Electrical Engineer and/or
- COPA Electrical Technical Authority (or alternate)

Above grade cable marking	All above grade temporary cables must be sufficiently marked, guarded and inspected periodically along with their signage and barricades to ensure they remain known and protected. Notify the Board Operator and Lead Electrician of any problems or concerns regarding above grade cables. Unit operators should inspect the cable for issues during their daily rounds.

Energized Electrical Work Permit Requirements

Energized Electrical Work Permit Requirements	When energized work is performed as permitted by NFPA 70E, an energized electrical work permit will be required and documented when work is performed within the restricted approach boundary OR performed work increases likelihood of injury from an exposure to an arc flash hazard. Refer to NFPA 70E Table 130.4(E)(a) for restricted approach boundary distances and Table 130.5(C) for a non-exhaustive list of tasks deemed having increased likelihood of occurrence of an arc flash event. Some of common tasks performed at COPA facilities that require Energized Electrical Work Permit include but not limited to: • Replacing motor overloads which are installed in the restricted approach boundary • Operating overhead power line switch or fuse cutouts switches • Operating fuse cutouts in pad mount switches • Inserting/removing MCC bucket • Operating power circuit breakers that don't have up to date maintenance records • Operation of a circuit breaker or switch the first time after installation or completion of work or maintenance in the equipment • Operating breaker/switch in equipment where normal operating condition doesn't exist Refer to NFPA 70E 130.5(C) for a non-exhaustive list of tasks deemed having increased likelihood of occurrence of an arc flash event, thus requiring energized electrical work permit.

Energized Work Permit Exceptions	An Energized Electrical Work Permit will not be required if a qualified person is provided with and uses appropriate safe work practices and appropriate PPE under any of the following conditions: • Testing, troubleshooting, and voltage measuring. • Thermography and visual inspections if the restricted approach boundary is not crossed. • Access to and egress from an area with energized electrical equipment if no electrical work is performed and the restricted approach boundary is not crossed. • General housekeeping and miscellaneous non-electrical tasks if the restricted approach boundary is not crossed.

Batteries, Power Electronic Equipment and Capacitors

Batteries	Working hazards like the battery effect, electrical shock, arc flash, and chemical exposure are present when working on batteries. Workers must complete an electrical risk assessment utilizing hierarchy of controls, perform pre-job planning and select appropriate PPE as outlined in above sections. **NOTE:** Additional safety guidance can be found in Articles 310 and 320 of NFPA 70E.
Power Electronic Equipment	UPS systems and adjustable speed drives present potential stored energy, electrical shock, and arch flash hazards. Workers must complete an electrical risk assessment utilizing hierarchy of controls, perform pre-job planning, and select appropriate PPE as outlined in above sections. **NOTE:** Article 340 of NFPA 70E covers additional responsibilities.

Capacitors	Workers must complete an electrical risk assessment prior to working with capacitors if stored energy hazard thresholds exceed any of the following: • <100V and >100 Joules of stored energy • ≥100V and >1.0 Joule of stored energy • ≥400V and >0.25 Joules of stored energy The risk assessment must include: • all components in the Electrical Risk Assessment section • written procedure developed by an Electrical Engineer for establishing an electrically safe work condition Employees working with capacitors must consult Article 360 of NFPA 70E and Appendix R for essential safety guidance such as practices of discharging stored energy and using appropriate boundaries.

Site Safety Equipment and PPE

Safety signs and barricades	Safety signs will be posted to warn of electrical hazards. Barricades will be used to limit access to work areas where there is potential for contact with exposed or uninsulated energized conductors.
PPE usage	Arc-rated clothing and other PPE will be used by the employee based on the incident energy exposure associated with the specific task. Recognizing that incident energy increases as the distance from the arc flash decreases, additional PPE will be used for any parts of the body that are closer than the working distance at which the incident energy was determined. When an individual is within the flash protection boundary, he/she must wear appropriate PPE in accordance with NFPA 70E, Section 130.7. Workers within the approach boundaries of conductors energized at ≥50V must use PPE and insulated tools required for the work. This equipment may consist of: • rubber insulating gloves • insulated or insulating tools • hoods • sleeves • matting • blankets • line hose • industrial protective helmets All PPE must be inspected before use. A periodic inspection of all electrical PPE must be performed per manufacturer's instructions.
Insulated tool/PPE care and standards	Maintain insulated tools and protective equipment in a safe, reliable condition. Only use tools/PPE in good working condition. Damaged tools or PPE equipment must be removed from service and properly tagged. Insulated tools and other equipment should be maintained and tested in accordance with the manufacturers published instructions. Tools that are used by workers to handle energized conductors must be rated and listed for the voltages and stresses to which they are exposed. Specific requirements for the use and periodic testing of electrical protective equipment are provided in NPFA 70E Section 130.7.

Electrical Risk Assessment and Pre-Job Planning

Electrical Risk Assessment

Electrical Risk Assessment

Risk assessment will be performed to identify hazards, assess arc flash and electric shock risks, and implement risk control according to the hierarchy of risk control methods. The assessment must include the components in this section.

Determine

Determine the following:

Item	Check	Item	Check
Task to be performed	☐	Equipment voltage(s)	☐
Protective measures	☐	Available incident energy	☐
Equipment Tag	☐	Arc flash boundary	☐
Shock protection boundaries	☐	Shock & arc flash PPE requirements	☐
Chemical/thermal hazards	☐	Arc blast hazards	☐
Stored energy hazards	☐		

Estimate Potential Risk of Injury

The estimate of the likelihood and severity of occurrence of injury or damage to health and potential severity of injury or damage to health will take into consideration the following:

- The design of the electrical equipment, including its overcurrent protective device and its operating time
- The electrical equipment operating condition and condition of maintenance

Consider Human Factors

Human errors are often identified as a root cause of incidents. The Electrical Risk Assessment must consider factors such as:

- fatigue
- complacency
- distraction
- stress
- miscommunication
- overconfidence, and physical limitations

Utilize Hierarchy of Risk Control Methods

Preventive and protective risk control methods must be implemented in accordance with the following hierarchy:

Hierarchy	Control Method
1	Elimination
2	Substitution
3	Engineering Controls
4	Awareness
5	Administrative Controls
6	PPE

Appropriate PPE selection will be based on equipment voltage for shock protection and available incident energy and arc flash boundary for arc flash protection.

Does Normal Operation Condition of Equipment exist?

Item	Check
Properly installed	☐
Properly maintained	☐
Rated for the available fault current	☐
All doors are closed and secured	☐
Used per instructions by listing/labeling/manufacturer	☐
No evidence of impending failure	☐
All covers are in place & secured	☐

Pre-Job Planning

Pre-Job Planning

A pre-job meeting must be held to identify hazards and/risks to be mitigated before work is started on conductors or equipment operating at ≥50V.

Before starting each job, the person in charge must conduct and document a job briefing with the workers involved. The briefing must consider the components in the checklists below in this section.

Topic	Item	Check
Hazard Identification	Hazards associated with the job	☐
	Voltage Level involved	☐
	Skills Required	☐
	Any secondary voltage sources	☐
	Number of people to do job	☐
	Available incident energy	☐
	Electrical Risk assessment	☐
	Arc flash boundary	☐
	Any evidence of impending failure	☐
	Shock protection boundaries	☐
Ask	Can equipment be de-energized?	☐
	Are backfeeds of the circuits to be worked on possible?	☐
	Is standby person required?	☐
	Is energized electrical work permit required?	☐
	Is the equipment properly installed and maintained?	☐
Check	Job plans	☐
	Single line diagrams	☐
	Vendor prints	☐
	Information is up to date	☐
	Safety procedures	☐
	Individuals are familiar with the facility	☐
Know	What the job is	☐
	What skills are required	☐
	Who else needs to know? Communicate	☐
Think	About the unexpected event… what if?	☐
	Test for voltage FIRST	☐
	Use the right tools and equipment, including PPE	☐
	Install & remove temporary protective grounding equipment	☐
	Install barriers and barricades	☐
	Lock – Tag – Test – Try	☐
	What else?	☐

Preparing for Emergencies

Two qualified employees with the same level of training will be present when working on energized circuits above 480V.

Prior to start, the following must be completed:

Item	Check
Identify all electrical disconnects	☐
Ensure safety equipment is made available	☐
Confirm availability and contact info of certified CPR/AED trained person	☐
Review emergency contacts and communication (radio, telephone numbers, etc.)	☐

Additional meetings will be held if significant changes occur during work.

NOTE: A "Qualified" Level II worker cannot observe a Level III work, nor can a Level III watch a Level IV.

Energized Electrical Work Permit

Part 1: TO BE COMPLETED BY THE REQUESTOR					
1. Requestor / Job Title:		2. Job / Work Order #:		3. Date:	
4. Description of circuit / equipment / job location:					
5. Description of work to be done:					
6. Justification of why the conductors or circuit parts cannot be placed into electrically safe condition or work postponed until the next scheduled outage:					

Part 2: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK									Check when complete
7. Detailed job description procedure to be used in forming the above detailed work:									☐
8. Description of the safe work practices to be employed:									☐
9. Results of the shock risk assessment									
9a.	Voltage to which personnel will be exposed:		Volts		☐	AC	☐	DC	☐
9b.	Limited approach boundary:		Feet			Inches			☐
9c.	Restricted approach boundary:		Feet			Inches			☐
9d.	Necessary shock personal, and other protective equipment to safely perform the task:								☐
10. Results of the arc flash risk assessment									
10a.	Available incident energy at the working distance:		cal/cm^2						☐
10b.	Arc flash boundary:		Feet			Inches			☐
10c.	Necessary arc flash personal, and other protective equipment to safely perform the task:								☐
11. Means employed to restrict the access of unqualified persons from the work area:									☐
12. Evidence of completion of a job briefing and electrical assessment									☐
13. Do you agree the work described above can be completed safely?				☐	Yes	☐	No		
Electrically qualified person:			Electrically qualified person:						

Part 3: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED					
Lead / Foreman:		Date:		Time:	
Maint. Supervisor:		Date:		Time:	

Electrical – Energy Isolation Procedure (E-EIP) Form

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 1 of 7)

Job Description:

Date:

Location:

EIP Review / Approval

E-EIP Prepared by: _____

Approved by: _____ **(ConocoPhillips Electrical Lead, required)**

Approved by: _____ **(Electrical Contractor Lead, required)**

Approved by: _____ **(Performing Authority, optional)**

Audited / Reviewed by: _____ **(Isolation Authority, optional)**

EIP Guideline

This form will be used for defining the electrical energy isolation procedure (E-EIP) for working on electrical systems only. Workers will be trained in the site-specific lockout tag out procedures.

This E-EIP is to be used as a standalone document for work which encompasses only electrical systems (e.g., transmission and distribution systems), and which does not involve any crafts other than electrical workers.

This document can be attached or referenced in a generic multi-discipline EIP or Energy Isolation List for work which involves multiple disciplines.

References

- Alaska Safety Handbook (ASH)
- SkillsNOW Shutdown and Restart Procedures
- Drawings
- COPA Electrical Safety Program
- NFPA 70E Article 120, Establishing an Electrically Safe Work Condition
- OSHA 1910 Subpart S, Electrical
- OSHA 1910.269, Electric Power Generation, Transmission, and Distribution

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 2 of 7)

Preparation

The following drawings describe the work area:

Drawing Number	Rev.	Description

Task	Electrician Performing Work		COPA Electrician	
	Name	Date	Name	Date
Completed Power system walk down?				
Completed Pre-job planning meeting?				
1-Lines, Isolation Drawings, Panel Schedules attached?				
All multiple power sources identified?				
All potential back feed sources identified?				
All control power sources identified?				
Arc Flash labels verified?				
Correct PPE for incident energy?				

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 3 of 7)

De-Energizing Circuits - Shutting Down, Isolating, & Eliminating Electrical Energy

No work will commence until permission has been received from COPA Operations and COPA Electricians.

Enter specific sequence for de-energizing circuits.
Identify specific equipment tag number, circuit numbers, and locations for all devices included in the energy isolation.
Apply lock out/tag out devices as per the Alaska Safety Handbook.
List all specific breakers, contactors, disconnects, etc. that are locked out; and all grounding clusters and the locations that are applied.
Circle the step numbers for locks and ground clusters.
All locks and ground clusters will be entered in the Electrical Energy Isolation List.

Ref. No	Description	Electrician Performing Work
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 4 of 7)

Verify There is No Electrical Energy

Verification Step	Electrician Performing Work
Ensure all test equipment is correct, in safe condition, recently calibrated, and set up for the maximum expected	
Disconnect power capacitors from circuit.	
De-energize, **lock-out**, and **tag-out** the work area per the steps listed on page 3 of this form.	
At each point of work, **verify** absence of voltage on each phase conductor or circuit by using an adequately rated test instrument. **Determine** that the test instrument is operating satisfactorily through verification on a known voltage source.	
Enter specific procedure steps for confirming that there is no voltage on the equipment to be worked on. Identify specific equipment tag numbers, circuit numbers, descriptions, and locations, etc.:	
1.	
2.	
3.	
4.	
5.	
Discharge capacitors and long shielded power cables.	
Re-confirm there is no voltage in the work area, before applying grounding device.	
Attach personal grounding clusters and/or grounding devices to equipment as required.	

Completion of Required Work

	Individual or designated worker	
	Signature	**Date**
Work is complete and ready for EIP removal.		

Release from Lock Out/Tag Out

- Ensure that field work is completed.
- Ensure all workers are accounted for and safely positioned.
- Ensure all tools, test equipment, etc. have been removed and are accounted for.
- Ensure ***Electrical Energy Isolation List*** and the ***Electrical Energy Isolation Worker Log*** are closed out.
- Notify Operations and other affected people before equipment is re-energized.

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 5 of 7)

Re-energizing Circuits

Enter specific sequence for re-energizing circuits.

Identify specific equipment tag numbers and locations along with circuit numbers, etc.

Remove Lock Out/Tag Out devices as per the ASH.

List all specific breakers, contactors, disconnects, etc. that are unlocked and closed.

List the removal of all grounding clusters and their locations.

All locks and ground clusters will be signed off in the Electrical Energy Isolation List.

Ref. No	Description	Electrician Performing Work
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 6 of 7)

ELECTRICAL ENERGY ISOLATION LIST

Date:

Facility:

Power Line/Switchgear:

Switchgear:

Designated Operator:

Work Description:

Note: "EIP Change" will be stamped or written in red immediately under the last entry on the Electrical Energy Isolation List if an isolation device, such as a lock, is added to, or removed from the previously established EIP. Changes must be approved by First-Line Supervision or Designee.

- Exceptions are temporary re-energize procedures for servicing or maintenance

***If checked, an isolation device is to be re-installed for return to service

Lockout Tag No.	Power Line / Switchgear	Device #	Description	Installed Date / Initial	Reviewed Date / Initial	Removed Date / Initial	Reviewed Date / Initial

ELECTRICAL – ENERGY ISOLATION PROCEDURE (E-EIP) FORM (Page 7 of 7)

ELECTRICAL ENERGY ISOLATION WORKER LOG

Note: You must clearly designate if you are working under a group lock procedure.

- Indicate who will be the Designated Worker with a check in the proper column
- Designated Worker must initial next to the workers names in their group.
- Multiple Group numbers will indicate multiple independent groups working on the same job.
- Follow the provisions of the Worker Responsibilities Section of the Energy Isolation Standard in the ASH.

Note: "EIP Change" will be stamped or written in red immediately under the last entry on the Electrical Energy Isolation List if an isolation device, such as a lock, is added to, or removed from the previously established EIP. Changes must be approved by First-Line Supervision or Designee.

- Exceptions are temporary re-energize procedures for servicing or maintenance

Designated Worker	Group #	Worker's Name (Print)	Company Craft	Date	Sign In	Sign Out

Electrical Safety Audit Verification

Verification Performed by:	Date:
Area:	Unit:

Instructions:
Answer each question and check one response. For each NO response, write an action item with an explanation. Record both planned action items, as well as any immediate actions you took to correct the problem. Use the reverse side of the form or attach additional pages, if needed. All action items are tracked to document the audit program's value.
Note: A site-specific audit form may be used in lieu of this checklist, but it is the auditor's responsibility to ensure these questions are addressed, as applicable.

Documentation Review	**Yes**	**No**	**N/A**
1. Have you reviewed the current Electrical Safety Program?			
2. Have you reviewed the applicable ASH Policies regarding Electrical Safety?			
3. Has Level III training been documented for Electricians?			
4. Is the annual recertification also documented for current Level III?			
5. Has Level IV training been completed for Electricians performing power line and lineman duties?			
Personnel Interaction / Observation			
6. Has the ASH Energy Isolation Program been implemented and are the NFPA 70E (current edition) tables available and being referenced?			
7. Has an Energized Electrical Work Permit been completed?			
8. Have personnel been trained in CPR/First Aid, as well as Emergency Procedures?			
9. Is PPE available and being properly worn and used while performing electrical work?			
Corrective Action Follow-up from Previous Audits (as applicable to the scope of this audit)			
1. Is corrective action taking place for findings identified in Intelex?			
2. Were findings properly corrected and documented?			
Specific Questions Developed During the Audit (Optional – Use feedback from observed worker)			
General Observations (List both strengths and weaknesses found and verbal feedback from observed worker)			

Action Items – List items immediately corrected, as well as future items. All items must be tracked to resolution in Intelex.

#	Recommended Action	Assigned to:	Due date:
1.			
2.			
3.			
4.			