

Revision No. 2	06/ 01 / 2006	Page 1 of 2
Kennecott Utah Copper Corporation Safety and Health Standards		Standard No. 16.22 Electrical Transmission Lines

16.22.1 **INTRODUCTION**

16.22.1.1 This standard covers design, construction, operation, and maintenance of all transmission lines in the KUC power network.

16.22.2 **REQUIREMENTS**

16.22.2.1 **GROUNDING** - Wood structures shall have a copper butt plate and spiral wrapped with a minimum #6 AWG soft-drawn copper wire up to ground level. Spiral wraps shall be short-circuited together by the vertical ground wire and stapled at every crossing. The wire is to be extended straight up the pole and stapled at no more than three foot intervals. All hardware and shield wires shall be connected to pole ground wires.

- Steel lattice-type towers shall be grounded through the steel structure. Bolted joints shall be inspected for tightness at such intervals as experience has shown to be necessary.
- Tubular steel towers shall be grounded through anchor bolts and grounding lugs provided.
- Ground resistance should be monitored at strategic locations and records kept in accordance with the [Electrical Grounding Standard 16.10](#).

16.22.2.2 **LIGHTNING PROTECTION** - All transmission lines shall have shield wires in place. Shield wires shall be extra high strength galvanized steel or copper-clad steel, as determined by location and shall be securely connected to structure ground conductors. Lightning arrestors shall be installed at transformer bank primaries, fused disconnects, and in substations.

16.22.2.3 **WARNING SIGNS** Warning signs must be posted on all steel transmission line towers. Signs shall be mounted at a height of 5 to 7 feet on all four sides of the tower. These signs shall clearly indicate **Danger and High Voltage**.

16.22.2.4 **CLIMBING STEPS** - Climbing steps will be installed on steel structures, if needed, and will begin at a point at least 12 feet above ground level. Steps below 12 feet high will be removed. Steps will not be installed on wood poles. Structures accessible to the public will have steps beginning at 15 feet above ground level, if steps are required.

16.22.2.5 **CLEARANCES** - Vertical and horizontal clearances between power lines and ground or other obstructions will be in accordance with published standards, taking into account line voltage, structure type, loading class, span length, type of terrain, and all other applicable constraints.

References: KUCC Safety and Health Standard 16.10 Electrical Grounding KUCC Safety and Health Standard 16.12 Lockout / Tagout (Isolation) FAA Part 77 Airspace Obstruction Analysis FAA Obstruction Marking and Lighting					
Signatures					
Original signed by: Frank Klobchar	08/29/06	Original signed by: Scott Lawson	08/31/06	Original signed by: Bill Champion	09/11/06
_____ Standards Committee Chairman	_____ Date	_____ Vice President Human Resources	_____ Date	_____ President, KUCC	_____ Date

- Approved clearances will be maintained between energized conductors and grounded structure parts. Energized conductors with less than minimum clearance will be shielded or insulated to protect personnel and equipment. Safety hazard signs shall also be posted.
- Any powerline that could be an obstruction to air navigation will be identified by marker balls. This includes overhead lines exceeding 200 feet above ground level. In the event of a valley, ravine or gorge, the lowest point is used to determine elevation.
 - Markers should be spaced equally along the wire at intervals of approximately 200 feet or fraction thereof.

16.22.2.6 **INSULATION** - Insulation of energized conductors from structures shall be installed in accordance with operating voltage, impulse level required, and ambient conditions.

16.22.2.7 **VISUAL INSPECTION** - All transmission lines shall be visually inspected at such intervals as experience has shown to be necessary. Inspections shall be documented and corrective action shall be promptly taken to correct problems identified during the inspection.

- Switches shall be exercised at such intervals as experience has shown to be necessary.

16.22.2.8 **THERMOGRAPHIC SURVEY** - An infrared thermographic survey of all transmission lines shall be conducted at such intervals as experience has shown to be necessary. Any hot spots discovered in the thermographic survey shall be promptly corrected. Accurate records of location, equipment, and temperature rise shall be taken and maintained.

16.22.2.9 **WEED CONTROL** - Areas around wood poles subject to weed growth shall have an environmentally-acceptable herbicide applied in a six-foot radius around each pole at intervals as necessary to control weeds and eliminate danger of pole damage from ground fires.

16.22.2.10 **GUY WIRES** - Guy wires on wood poles shall have insulators installed at 8 feet above ground level to protect personnel. Guy wires shall be adequately marked and protected from damage.

16.22.2.11 **LINE WORK** - Line work shall be performed only by qualified linemen.

- Tools and safety equipment shall be inspected and tested at prescribed intervals.
- Wherever possible, before line work is begun, the line will be isolated and grounded according to the [Lock and Tag Procedure 16.12](#), Kennecott Electrical Switching Procedures, and the Kennecott Substation and Switchyards Manual.
- Hot line work, if required, will be performed in strict compliance with established procedures.

16.22.2.12 **NEW CONSTRUCTION and MAINTENANCE** - New construction and maintenance shall conform to all applicable requirements contained in this standard and all other codes and regulations.