ELLEN F. ROSENBLUM
Attorney General

FREDERICK M. BOSS
Deputy Attorney General

DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

November 10, 2016

***via* Hand Delivery**

Oregon Public Utility Commission
ATTN: Filing Center
201 High Street SE, Suite 100
Salem, OR 97301

RE: Docket PCN 1 - In the Matter of UMATILLA ELECTRIC COOPERATIVE ASSN. Petition for Certificate of Public Convenience and Necessity

Dear Filing Center:

Enclosed for electronic filing are the following exhibits:

Staff's Testimony (Exhibits 100 and 200);
Witness Qualification Statements (Exhibits 101 and 201); and
Exhibits 102-103 and 202-204 supporting Staff's Testimony.

Sincerely,

Johanna Riemenschneider
Sr. Assistant Attorney General
Business Activities Section

Enclosures

cc w/encls:
Tommy A. Brooks
Chad M. Stokes
Robert Echenrode

CERTIFICATE OF SERVICE

PCN 1

I certify that I have, this date, caused to be served Staff's Testimony in Docket **PCN 1** upon the parties listed below via first class mail.

TOMMY A BROOKS
CABLE HUSTON BENEDICT, et al.
1001 SW FIFTH AVE, STE 2000
PORTLAND OR 97204-1136

CHAD M STOKES
CABLE HUSTON BENEDICT, et al.
1001 SW 5TH - STE 2000
PORTLAND OR 97204-1136

ROBERT ECHENRODE
UMATILLA ELECTRIC COOPERATIVE ASSN
PO BOX 1148
HERMISTON OR 97838

DATED this 10th day of November, 2016.

Johanna Riemenschneider, OSB # 990083
Sr. Assistant Attorney General
Of Attorneys for Staff of the Public Utility Commission

CASE: PCN 1
WITNESS: GEOFFREY IHLE

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 100

Staff Testimony

November 10, 2016

Q. Please state your name, occupation, and business address.

A. My name is Geoffrey Ihle. I am a Senior Economist employed in the Energy Rates, Finance and Audit Division of the Public Utility Commission of Oregon (OPUC). My business address is 201 High Street SE, Suite 100, Salem, Oregon 97301.

Q. Please describe your educational background and work experience.

A. My witness qualification statement is found in Exhibit Staff/101.

Q. What is the purpose of your testimony?

A. My testimony responds to the opening testimony in PCN 1 filed by Louis S. Toth and Robert Echenrode on behalf of Umatilla Electric Cooperative (UEC), as well as UEC's filed petition. My testimony reviews and analyzes Umatilla Electric Cooperative's (UEC's) proposed five mile overhead transmission line (Project) for necessity, practicability and compatibility with local land use regulations (Goals). Staff Witness Gibbens addresses safety and justification for the Project in his testimony (Staff/200). An examination of these five areas is required for the Commission to issue the requested Certificate of Public Convenience and Necessity (CPCN).

Q. Did you prepare an exhibit for this docket?

A. Yes, I prepared the following exhibits:

- Staff Exhibit 101: Witness Qualification
- Staff Exhibit 102: UEC's Response to Staff Data Requests
- Staff Exhibit 103: Land Use Guidelines

Q. How did you analyze UEC's petition?

A. Staff reviewed the Petition and its supporting testimony, issued 36 data requests and evaluated UEC's responses to those data requests, and considered available guidance on statewide land use planning. I also traveled to the City of Hermiston to attend the September 22, 2016, PCN 1 Public Hearing held in this docket on September 22, 2016.

Q. Please summarize the results of your analysis.

A. I find the Project to be necessary, practicable, and compatible with relevant land use Goals. The Project is necessary in order to maintain and increase system stability. The Project is practicable because the route is feasible and the Project will be effectively and efficiently constructed. The Project is compatible with relevant land use Goals because the Project process allows public involvement, and the Project has little impact on the environment or surrounding land use and supports the surrounding economy.

Q. Does Staff recommend that the Commission grant the request for a CPCN?

A. Yes. Staff Witness Gibbens and I find that the Project is necessary, safe, practicable, justified, and compatible with land use regulations, and conclude that UEC has met all requirements for a CPCN.

Q. How is your testimony organized?

A. Staff's testimony separates the examination into five topics: safety, justifiability, necessity, practicability, and conformance to land use guidelines. My testimony is organized as follows:

The remaining topics of safety and justification are addressed in the Staff testimony of Scott Gibbens.

ISSUE 1, BACKGROUND

Q. What is UEC, and why did UEC file a petition with the Commission for a Certificate of Public Convenience and Necessity?

A. UEC is an Oregon electric cooperative, serving members in Morrow, Umatilla, Union, and Wallowa counties. Due to significant load increases over the past five years, UEC identified the need for a new, 115 kV overhead transmission line running the five miles between BPA's McNary substation and the Hermiston Butte substation. The need was identified first in UEC's February 2016 construction work plan. The proposed line was specifically identified by UEC Board resolution in July, 2015, which resolved that the line is necessary for continued public health, safety, and economic welfare.[1] UEC believes it may need to obtain easements on properties along the transmission path in order to construct the line as proposed.[2] Therefore UEC has petitioned the Commission for a CPCN in order to initiate condemnation proceedings for necessary land or interests in land. As of the time of its initial filing, UEC had reached private agreements with roughly three-quarters of the affected property owners. Since that time, the Company has reached agreements in all but 17 of the 71 parcels.[3]

[1] UEC/203, Echenrode/1.
[2] UEC Petition at 1.
[3] Exhibit Staff/102, Ihle/29-30. Data request response 36, attachment 1.

While the Commission does not regulate retail rates for member-owned utilities, all utilities—including member-owned utilities—must petition the Commission in order to obtain a CPCN.[4]

Q. How does the Commission determine whether a CPCN should be granted, and what is Staff's role?

Commission review is triggered when condemnation of certain land interests is required to build transmission infrastructure. This is infrequent; the most recent similar review occurred in 2011.[5] In such a review, Oregon Revised Statute (ORS) 758.015 and Oregon Administrative Rule (OAR) 860-025-0030 require the Commission to conduct an investigation to "determine the necessity, safety, practicability and justification in the public interest for the proposed transmission line...."[6]

In Order 11-366, the Commission concluded that "these words are delegative terms, and we have broad discretion to construe and apply them in the context of the laws and policies governing the condemnation of public property."[7] In its Order, the Commission discussed the specific meanings of each of those terms;[8] Staff relies on that guidance in this testimony.

Staff's testimony supports this investigation by providing an independent analysis of these factors. Furthermore, in consideration of the Commission's

[4] ORS 758.015(1).
[5] *See In re Pacific Power & Light*, OPUC Docket No. UM 1495, Order No. 11-366 (Sept. 22, 2011).
[6] ORS 758.015(2).
[7] Order No. 11-366 at 3.
[8] *See* Order 11-366 at 3-4.

guidance in Order 11-366, Staff considers the "public interest" when addressing each of these requirements, rather than as a separate standard.[9]

[9] Order 11-366 at 2-3.

ISSUE 2, NECESSITY

Q. What is the relevant "necessity" standard?

A. Regarding "necessity," the Commission found that "the petitioner must demonstrate that Oregonians will forego something desirable and useful without [the proposed transmission Project]."[10]

Q. Why has UEC asserted that the Project is necessary?

A. UEC has asserted that the Project is necessary in order to maintain and increase system stability.[11]

Q. What criteria did Staff consider when reviewing the necessity of the Project?

A. Staff used the standard the Commission previously set out for necessity discussed above. In this case need means that without the Project, members of the Oregon public will forego something desirable or useful. Staff notes that most specific projects are not truly "necessary" in the sense that no alternatives exist at any price. Therefore Staff believes that the necessity requirement should be deemed met if it is shown that some action should be taken to provide the Oregon public something desirable or useful, and the transmission construction Project in question is shown to be favorable to other options available, if any.

Q. Has UEC's system experienced rapid growth?

A. Yes. UEC represents that its power sales have increased by more than 70 percent over the last five years.[12] In response to a Staff data request, UEC

[10] *Ibid.*
[11] UEC/100, Toth/6.

provided Staff with annual customer count by class (residential, irrigation, etc.) as well as monthly non-coincident peak demand data for the time period January 2011 through December 2015.[13] While the growth in the number of customers in most classes is modest, I note that the five-year growth of the "Commercial and Industrial over 1,000 kVA" class has been greater than 30 percent comparing beginning and end-period values.[14] Furthermore, in that same window of time, maximum non-coincident peak demand on UEC's system has almost doubled.[15]

Q. Is UEC's system expected to continue to experience significant growth?

A. Yes. In response to a data request, UEC provided their 2014 – 2026 load forecast, as well as a letter indicating it had been reviewed and approved by the United States Department of Agriculture (USDA) Rural Utilities Service (RUS).[16] This forecast shows UEC's total electric need increasing from 2.6 million MWh in 2017 to 3.5 million MWh in 2026.[17]

Q. What impact is this growth expected to have on UEC's system?

A. UEC represents that reliability is expected to increasingly suffer without the proposed transmission line: *"There have historically been outages on the existing 115 kV system and the existing 115 kV line (...). With the load growth UEC has experienced, and continues to experience, reliability issues are*

[12] UEC/200, Echenrode/2.
[13] Staff/102, Ihle/9. Data request response 18, attachment 1.
[14] *Ibid.*
[15] 2011 peak demand was set in August at 251,043 kW. 2015 peak demand occurred in November at 498,203 kW. *Ibid.*
[16] Staff/102, Ihle/23-24. Data request response 32, attachment 2.
[17] Staff/102, Ihle/22. Data request response 32, attachment 1.

expected to increase in severity due to the added duty of the line."[18] In response to a data request, UEC provided summary outage information of the existing transmission line along the proposed route for the 10-year periods 1996 – 2005 and 2006 – 2016.[19] While the frequency of outages does not appear to have increased—with seven in each of the two periods—the severity of the outages did: the average outage duration was one hour in the first period, and two-and-one-half hours in the second period.[20]

Q. How was this Project identified by UEC?

A. This Project was identified in UEC's Construction Work Plan, which is the process UEC uses to *"determine construction that will be required in order to provide adequate and reliable electric service to new and existing members. (...)The proposed Transmission Line is identified in the CWP as one of the Projects UEC must undertake to provide adequate and reliable service."*[21]

Q. Did UEC consider alternatives to this transmission Project to meet its reliability need?

A. Yes. UEC considered upgrading the existing line. This was determined to be an unfavorable option, as it would be more expensive than the Project, and would not provide the same level of long-term reliability benefits.[22] Staff agrees that having a second transmission path from McNary into the Hermiston area

[18] UEC/100, Toth/4.
[19] Staff/102, Ihle/13-14. Data request response 24, attachment 1.
[20] *Ibid.*
[21] UEC/200, Echenrode/2-3.
[22] UEC/100, Toth/8-9.

will likely improve reliability more than having only one transmission path—even if it is upgraded.

Additionally, Staff learned through a data request that because UEC's entire system is at one voltage—115 kV—alternative line voltages were not considered.[23] Staff finds this to be reasonable, as the additional expense to create compatibility with another voltage level would not be an economic investment.

Q. Does Staff believe UEC has met the "necessity" requirement?

A. Yes. In the course of planning to accommodate a growing system, UEC identified the need for this Project. Alternatives to this Project were found to be inadequate to support UEC's long-term needs, and were therefore appropriately rejected. Without the Project, UEC's customers will likely be exposed to increasing reliability issues. Improving reliability is in the public interest. Therefore Staff concludes that the Project is necessary and in the public interest.

[23] Staff/102, Ihle/1.

ISSUE 2, PRACTICABILITY

Q. What is the relevant "practicable" standard?

A. Staff relied upon the standard set forth by the Commission in Order 11-366: "… to establish the practicability of a Project, the petitioner must show the Project is feasible and will be effectively and efficiently constructed."[24]

Q. Why has UEC asserted that the Project is practicable?

A. UEC asserts that the Project is practicable because "UEC has selected the most practical, least-cost route for the Transmission Line. The starting and ending points for the line are fixed, as UEC must be able to transmit electricity from the McNary Substation to the Hermiston Butte Substation. By utilizing an existing transmission corridor that takes a relatively straight route between those two points, the Transmission Line will impact as few properties as is reasonably possible, will occupy a space already set aside for that purpose, and will keep costs lower than other, longer routes."[25]

Q. What criteria did Staff consider when determining whether the Project is practicable?

A. Staff considered whether the Project is feasible, and will be effectively and efficiently constructed.

Q. Is the proposed route feasible?

A. Yes. The route is feasible because it follows the route of existing power lines, i.e. routes that have already been shown to be feasible for this use. In its response to Staff DR 10, UEC indicates that the entire proposed route—with

[24] Order No. 11-366 at 4.
[25] UEC Petition at 9.

the exception of a single road crossing—utilizes existing transmission corridors.[26] The alternative routes considered are less feasible, as they each require several miles of corridor that are not in existing transmission corridors.

Q. Will the Project be effectively and efficiently constructed?

A. Yes. Founded in 1937, UEC has recently been growing at a rapid rate. UEC is now the largest electric cooperative in the 10 western states in terms of power sales.[27] In its response to Staff DR 15, UEC indicates: 1) preliminary design work is already complete; 2) it will award the construction contract to the winning bidder from a list of pre-qualified bidders; 3) bid documents will present the construction schedule in detail and consequences of deviation; 4) a UEC engineer will have Project management responsibility for UEC, overseeing materials procurement, contractor management, and budget and schedule; and, 5) ordering of major equipment requiring long lead times will be done so as to not cause delay.[28] Staff believes UEC's long and safe operational history make it uniquely qualified to select a contractor that can effectively and efficiently complete the work called for in UEC's design.[29]

Q. Is the Project practicable without the CPCN?

A. No. At the time of UEC's initial filing, UEC had been unsuccessful in obtaining easements for 19 of the 72 parcels on the proposed primary route. At the time of this filing, 17 of 71 required easements were still outstanding.

---

[26] Staff/102, Ihle/3.
[27] "2015 Annual Report Summary," *2015 Umatilla Electric Cooperative Annual Report*, accessed at: https://www.umatillaelectric.com/wp-content/uploads/2016/07/UEC-2015-Annual-Report-Summary_final.pdf.
[28] Staff/102, Ihle/2.
[29] See Staff/200, Gibbens/3.

Q. Is UEC able to avoid the need for obtaining land or an interest in land by using an alternate route?

A. No. The Company examined two reasonable alternative routes between McNary and Hermiston Butte (one to the left and one to the right of the proposed Project, both following existing rights of way). The west alternative route would affect 56 parcels and the east alternative route would affect 82 parcels.[30] The proposed primary route affects 77 parcels.[31] It is reasonable to assume that in either of the two alternative routes, UEC would find that some percentage of landowners would not be willing to consensually sell required easements. Further, the primary route follows existing right-of-ways (with the exception of one road crossing) and overlaps existing easements. The alternative routes each have several miles that do not follow right-of-ways, and would require construction of an entirely new line instead of the replacement of an existing line, and thus should be viewed less favorably.

Q. Are either of the alternative routes economically favorable to the proposed primary route?

A. No. The west alternative route is estimated to be $400,000 more expensive than the proposed route, and the east alternative route is estimated to be $1.26 million more expensive.[32]

[30] UEC/102, Toth/3.
[31] UEC/102, Toth/3.
[32] UEC/106, Toth/12.

Q. What is Staff's recommendation related to practicability?

A. I recommend the Commission find that the proposed Project is practicable and in the public interest because it uses a feasible route in an existing power line right of way and is economically favorable to the feasible alternatives studied.

ISSUE 3, COMPATIBILITY WITH LAND USE REGULATIONS

Q. What does the Commission require in order to adopt the land use findings described at OAR 860-025-0030(2)?

A. To issue a CPCN, the Commission must adopt findings that a proposed transmission line complies with Statewide Planning Goals and is compatible with the acknowledged comprehensive plan and land use regulations of each local government where the project will be located.[33] The available processes for making such findings are set forth in OAR 860-025-0030(3):

> *"The Commission's land use findings assuring the proposed project's goal compliance and plan compatibility shall be based on the hearing record, which shall include at least one of the following:*
>
> *(a) A copy of the local land use permit from each affected city or county planning agency, building department, or governing body stating that the proposed transmission project has received the jurisdiction's approval; or*
>
> *(b) A copy of a letter from each affected local planning agency, building department, or governing body stating that the proposed transmission project is permitted under the jurisdiction's comprehensive plan, land use regulations, and development codes, but does not require specific approval by the jurisdiction; or*
>
> *(c) Other written or oral land use information and documentation equivalent to OAR 860-025-0030(3)(a) or (b) above properly presented to the Commission from an authorized representative from each affected city or county; or*
>
> *(d) Commission goal compliance findings adopted pursuant to OAR 660-030-0065(3) in situations when the Commission is unable to assure Goal compliance by acting compatibly with one or more of the affected comprehensive plans."*

[33] OAR 860-025-0030(2).

Q. How has UEC proposed to support the necessary findings under OAR 860-025-0030(3)?

A. UEC identified two local authorities that have planning jurisdiction over the proposed line: the City of Hermiston, and Umatilla County, including the urban growth boundary area for the City of Umatilla that is outside the city limits.[34] UEC has submitted a letter from the City of Hermiston stating that the proposed transmission Project is permitted under the jurisdiction's comprehensive plan, land use regulations, and development codes, but does not require specific approval by the jurisdiction.[35] With regard to Umatilla County, UEC also submitted a letter from an assistant planner with the Umatilla County Department of Land Use Planning. The letter states a conditional use permit or, in the case of an F-1 zone, a zoning permit, is required for construction of a utility facility within its jurisdiction, and that issuance of such permits "would be consistent with the County's acknowledged Comprehensive Plan and land use regulations."[36] The County Planning Department reviewed the proposed route prior to preparation of this letter, but noted that a formal application and approval is still required before construction may occur.[37] UEC further provides an analysis showing the compatibility of its project with Statewide Planning Goals.[38]

---

[34] UEC/200, Echenrode/4.
[35] UEC/204, Echenrode/1.
[36] UEC/205, Echenrode/1-2.
[37] *Ibid.*
[38] UEC Petition at 23-26.

Q. Do both the City of Hermiston and Umatilla County have State-acknowledged comprehensive plans that implement Oregon's Statewide Planning Goals?

A. Yes. UEC's witness and Umatilla County both confirm that the local jurisdictions have acknowledged comprehensive plans and Staff concurs.[39]

Q. Does UEC provide adequate support for the project's goal compliance and plan compatibility within the City of Hermiston?

A. Yes. UEC provides a letter from Clinton F. Spencer, Hermiston City Planner, which states that the route passes through two zones: R-4 (Multi Structure Residential), and M-1 (Light Industrial). The letter goes on to state: *"Within the R-4 zone, transmission lines are permitted outright pursuant to Hermiston City Code §157.025(A)(7). Within the M-1 zone, transmission lines are permitted outright pursuant to Hermiston City Code §157.055(A)(20). As outright permitted uses, no land use approval is required and the City does not directly regulate this use."*[40]

Staff concludes this letter is sufficient to demonstrate that UEC's proposed line is permitted under the City's comprehensive plan, land use regulations, and development codes, but does not require specific approval by the jurisdiction. The Commission's rule specifically contemplates such a showing as adequate under OAR 860-025-0030(3)(b).

---

[39] UEC/200, Echenrode/5; UEC/205, Echenrode/1.
[40] UEC/204, Echenrode/1.

Q. Does UEC provide adequate support for the Project's goal compliance and plan compatibility within Umatilla County, including the urban growth boundary area for the City of Umatilla?

A. Yes. UEC provides a letter from Umatilla County confirming that the proposed line is compatible with its comprehensive plan and land use regulations, though permitting remains required: "Issuance of the permits described below would be consistent with the County's acknowledged Comprehensive Plan and land use regulations."[41] The County lists each of the various zones the proposed line would impact, including RLI, rural light industrial, LI, light industrial, RR-4, rural residential 4 acre, RR-2, rural residential 2 acre, M-1light industrial, F-2, general rural, F-1 Exclusive Farm Use, R-1, agricultural residential, R-3, urban residential, and C-1, general commercial.[42] The letter concludes, "If UEC applies for a conditional use permit and satisfies all of the applicable approval standards, the proposed transmission line could be approved as a Conditional Use Permit, and would be in compliance with the County's land use regulations."[43] Staff regards this letter as confirmation that the proposed line is generally compatible with an acknowledged comprehensive plan and local land use regulations for Umatilla County.

[41] UEC/205, Echenrode/1.
[42] UEC/205, Echenrode/2.
[43] *Ibid.*

Q. Of the 19 Oregon Statewide Planning Goals of OAR 660-015-0000, which do UEC identify as relevant to this application?

A. UEC identifies eight of the State's 19 Statewide Planning Goals as applicable to its petition: Goal 1: Citizen Involvement, Goal 2: Land Use Planning and Exceptions, Goal 3: Agricultural Lands, Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources, Goal 6: Air, Water, and Land Resources, Goal 8: Recreational Needs, Goal 9: Economy of the State, and Goal 13: Energy Conservation.

Q. What is the aim of Goal 1: Citizen Involvement?

A. It is, "To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process."[44]

Q. How does UEC assert this Goal is satisfied?

A. UEC asserts that this Goal will generally be met when local governments follow their public involvement procedures in their acknowledged plans and land use regulations. UEC notes that the proposed line is being noticed to affected property owners as part of the CPCN process, and that the County land use permitting process causes broader notice and will allow participation by anyone in the county.[45]

Q. Does Staff agree the project is compatible with this Goal?

A. Yes. In addition to agreeing with UEC's assertions regarding ways the public can participate, Staff also notes that the Umatilla County has an acknowledged

[44] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal1.pdf, included as Exhibit Staff/103, Ihle/1.
[45] UEC Petition at 23.

citizen involvement program, implemented through Umatilla County Development Code (UCDC) Chapter 152.[46] The CPCN process affords the public the opportunity to attend an open public hearing and affected parties the opportunity to intervene and participate in a contested case.

Q. What is the aim of Goal 2: Land Use Planning and Exceptions?

A. It is "To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions."[47]

Q. How does UEC assert this Goal is satisfied?

A. UEC notes that because UEC will need to obtain a conditional use permit from Umatilla County. A conditional use permit will only be issued if indeed the proposed Project is consistent with the Goals and policies in the acknowledged Umatilla County Comprehensive Plan. Therefore UEC asserts that this Goal is satisfied.[48]

Q. Does Staff agree this Goal is satisfied?

A. Yes. The Department of Land Use Planning for Umatilla County has opined that the proposed line would be generally compatible with its acknowledged plan. Therefore the Project does not require an exception under Goal 2, part II. The CPCN process also provides for consideration of the Statewide Planning Goals.

---

[46] Umatilla County Development Code, accessed at www.co.umatilla.or.us/planning/pdf/Umatilla_County_Development_Code.pdf.

[47] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal2.pdf, included as Exhibit Staff/103, Ihle/2.

[48] UEC Petition at 23-24.

Q. What is the aim of Goal 3: Agricultural Lands?

A. "To preserve and maintain agricultural lands."[49]

Q. How does UEC assert it has met this Goal?

A. UEC asserts that the proposed route avoids all lands zoned for exclusive farm use (EFU) and uses an existing transmission corridor.[50]

Q. Does Staff agree the project is compatible with this Goal?

A. Yes. The proposed route follows existing transmission corridors and UEC asserts it does not impact EFU lands. Staff's review of the map provided by UEC showing the applicable zones along the proposed route indicates there is an area near the proposed line that is zoned as EFU in the City of Umatilla urban growth boundary, but the line may be sited to avoid EFU lands.[51] Therefore the Project complies with Goal 3 by avoiding using, and thereby maintaining, lands zoned for exclusive farm use. If necessary, mitigating conditions may be imposed with any conditional use permit that may be issued by Umatilla County. UEC is correct that the line will follow an existing transmission corridor. Further, UEC anticipates staging construction equipment in the adjacent right of way, and expects the length of activity at each structure location to be relatively short.[52] Staff does not find evidence of any short-term activity that would impact agricultural production, nor any effect on long-term use of agricultural land.

---

[49] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal3.pdf, included as Exhibit Staff/103, Ihle/3.
[50] UEC Petition at 24.
[51] UEC/205, Echenrode/2-3.
[52] Exhibit Staff/102, Ihle/4.

Q. What is the aim of Goal 5: Open Spaces, Scenic and Historic Area, and Natural Resources?

A. It is "To protect natural resources and conserve scenic and historic areas and open spaces."[53]

Q. How does UEC assert this Goal is satisfied?

A. UEC asserts the local planning process provides for protection of natural resource areas, and that the proposed line does not pass through any inventoried significant natural resource areas, but commits to obtain any appropriate permits should such areas be identified.

Q. Does Staff agree this Goal is satisfied?

A. Yes. Staff has viewed the proposed route for UEC's transmission line, and has reviewed the documentation provided by UEC of the lands affected.[54] The existing transmission corridor runs through areas that are already developed for industrial, commercial, residential and agricultural uses. It does not appear to cross any wetlands, rivers or streams. Staff confirmed with the Umatilla County Department of Land Use Planning that the Project route does not cross any aggregate overlay zones,[55] which are zones that could potentially be Goal 5 resources. The proposed line will primarily use single wood poles, spaced approximately 300 feet apart.[56] In response to Staff data requests, UEC reported that it reviewed US Fish and Wildlife Information for Planning and

[53] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal5.pdf, included as Exhibit Staff/103, Ihle/4.
[54] UEC/107, Toth/1-25; UEC/108, Toth/5-15.
[55] Teleconference with Brandon Seitz, Assistant Planner, Umatilla County Department of Land Use Planning, November 09, 2016.
[56] UEC/100, Toth/12-13.

Conservation requirements and its website, but did not identify any critical habitats for listed species that may be present in Umatilla County.[57] UEC further indicated that it will need to clear only a minimal amount of trees, due to work on developed land and adjacent to the road rights of way.[58] No known bird collisions have been recorded within the route area with the existing line.[59] Staff anticipates any impacts on wildlife, open spaces and natural resources to be minimal.

Q. What is the aim of Goal 6: Air, Water, and Land Resources?

A. It is "To maintain and improve the quality of the air, water and land resources of the state."[60]

Q. How does UEC assert this Goal will be met?

A. UEC asserts the transmission line's operation will create little or no waste or material discharges. UEC further asserts that the Project will be constructed in accordance with all applicable statutes, regulations, and standards.[61]

Q. Does Staff agree UEC has met this Goal?

A. Yes. Staff agrees that transmission lines do not create significant waste through construction or through use, nor do they emit regulated air emissions. As stated above, the proposed route does not appear to cross any wetlands, rivers or streams, which minimizes the likelihood of any impact on water quality. To the extent construction or maintenance of the line would involve the

[57] Exhibit Staff/102, Ihle/5.
[58] Exhibit Staff/102, Ihle/6.
[59] Exhibit Staff/102, Ihle/7.
[60] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal6.pdf, included as Exhibit Staff/103, Ihle/5.
[61] UEC Petition at 24.

handling of materials that present a risk of harm to the environment, UEC commits in its petition to comply with all applicable statutes, regulations and standards.

Q. What is the aim of Goal 8: Recreational Needs?

A. It is "To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts."[62]

Q. How does UEC assert this Goal has been satisfied?

A. UEC asserts it meets this Goal by using existing transmission corridors, thus leaving relatively more undeveloped land available for recreation.[63]

Q. Does Staff agree the project is compatible with this Goal?

A. Yes. Using existing transmission corridors is the least-impactful way to route the Project. The proposed route is not located near any recreational facilities or properties. Staff confirmed with the Umatilla County Department of Land Use Planning that the affected parcels would not appear in any existing recreational plan based on their zoning.[64] Staff does not foresee the proposed project having an impact on recreational opportunities in the area.

---

[62] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal8.pdf, included as Exhibit Staff/103, Ihle/7.

[63] UEC Petition at 25.

[64] Teleconference with Brandon Seitz, Assistant Planner, Umatilla County Department of Land Use Planning, November 09, 2016.

Q. What is the aim of Goal 9: Economy of the State?

A. "To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens."[65]

Q. How does UEC assert this Goal has been satisfied?

A. UEC asserts that the increased reliability the Project will provide and the additional transmission capacity available will support future load growth, which allows for growth in commercial and industrial loads.[66]

Q. Does Staff agree the project is compatible with this Goal?

A. Yes. Staff agrees with UEC's assertions, and notes that the construction of the Project itself is also a positive economic activity.

Q. What is the aim of Goal 13: Energy Conservation?

A. It is "To conserve energy."[67]

Q. How does UEC assert this Goal is satisfied?

A. UEC asserts that using the shortest route practicable uses the least amount of materials. Further, UEC notes that shorter lines experience proportionally less line-loss, i.e. they conserve more energy.[68]

Q. Does Staff agree the Project is compatible with this Goal?

A. Yes. Short, direct routes are consistent with energy conservation principles. In addition, UEC has noted that continuing area growth in wind and solar

---

[65] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal9.pdf, included as Exhibit Staff/103, Ihle/8.
[66] UEC Petition at 25.
[67] OAR 660-015-0000(13).
[68] UEC Petition at 25-26.

resources provides a basis for ongoing growth in system electrical loading, which would be supported by the proposed line.[69]

Q. Which Goals does UEC not address in its Petition?

A. Goal 4: Forest Lands, Goal 7: Areas Subject to Natural Disasters and Hazards, Goal 10: Housing, Goal 11: Public Facilities and Services, Goal 12: Transportation, Goal 14: Urbanization, Goal 15: Willamette River Greenway, Goal 16: Estuarine Resources, Goal 17: Coastal Shorelands, Goal 18: Beaches and Dunes, Goal 19: Ocean Resources.

Q. Does Staff agree with UEC's assessment that those Goals are not applicable to this Project?

A. Many of these goals are not applicable to this petition. These goals by title alone, are not applicable: Goal 15: Willamette River Greenway, Goal 16: Estuarine Resources, Goal 17: Coastal Shorelands, Goal 18: Beaches and Dunes, Goal 19: Ocean Resources. Staff reviewed the remaining Goals, and finds, to the extent they are relevant, that issuance of a CPCN is compatible with these goals.

For the purposes of Goal 7: Areas Subject to Natural Disasters and Hazards, "natural hazards" refers to floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires.[70] Staff confirmed with the Umatilla County Department of Land Use Planning that there are no inventoried natural hazards—hazards specifically identified

[69] Exhibit Staff/102, Ihle/11.
[70] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal7.pdf, included as Exhibit Staff/103, Ihle/6.

as being worthy of special note—along the route of the proposed transmission line.[71]

Regarding Goal 10: Housing, Staff is not aware of any need for housing that may be generated by the project but cannot be met, and agrees this goal is not applicable.

Goal 11: Public Facilities and Services, focuses on the need for planning for the development of public facilities in a manner compatible with urban and rural growth.[72] Staff agrees this goal is not applicable.

Regarding Goal 12: Transportation, UEC indicates that it will stage construction to minimize impacts at any particular site as well as focus on work in the right of way.[73] And, the line itself will be relocated from within the right of way to an adjacent location, further minimizing impacts should the road rights of way be modified.[74] Staff finds the proposal is generally compatible with this goal.

Finally, Staff agrees that Goal 14: Urbanization, concerning urban growth boundaries, is not applicable in this context.

Q. Does this conclude your testimony?

A. Yes.

---

[71] Teleconference with Brandon Seitz, Assistant Planner, Umatilla County Department of Land Use Planning, November 09, 2016.
[72] Department of Land Conservation and Development's publication, Oregon's Statewide Planning Goals & Guidelines, accessed at https://www.oregon.gov/LCD/docs/goals/goal11.pdf, included as Exhibit Staff/103, Ihle/9.
[73] Exhibit Staff/102, Ihle/4.
[74] Exhibit Staff/102, Ihle/15.

CASE: PCN 1
WITNESS: GEOFFREY IHLE

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 101

Witness Qualifications Statement

November 10, 2016

WITNESS QUALIFICATIONS STATEMENT

NAME: Geoffrey Ihle

EMPLOYER: Public Utility Commission of Oregon

TITLE: Senior Economist
Energy Rates, Finance & Audit Division

ADDRESS: 201 High Street SE. Suite 100
Salem, OR. 97301

EDUCATION: B.B.A., Finance, Investments & Banking (1997)
University of Wisconsin-Madison

EXPERIENCE: I have been employed by the Public Utility Commission since August 2016 as a Senior Economist in the Utility Program's Energy – Rates, Finance and Audit Division. My current responsibilities include analysis and technical support for rate, finance, and audit related proceedings, with an emphasis on transmission and regional ISO-related matters.

Prior to working for the OPUC I was employed by Berkshire Hathaway Energy subsidiaries PacifiCorp, MidAmerican Energy, and Intelligent Energy Solutions. At PacifiCorp, I held the positions of Senior Analyst-Mid Office Risk, Analyst-Structuring & Pricing, and Manager-Structuring & Pricing. At MidAmerican Energy, I held the positions of Manager, Risk Management, and Director-Risk Management. At Intelligent Energy solutions, I held the position of Director-Strategy.

I also completed all course work necessary for Ph.D.'s in both Finance and Real Estate Economics at the University of Wisconsin-Madison. During this time I was a Teaching Assistant for courses such as Introduction to Finance, Low Income Housing Development, and Green and Sustainable Development.

CASE: PCN 1
WITNESS: GEOFFREY IHLE

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 102

Exhibits in Support of
Cross-Answering Testimony

November 10, 2016

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 1: Please explain why lower-voltage and higher-voltage lines were not considered as alternatives to UEC's proposed 115 kV transmission line.

Response

UEC's area transmission system is operated at 115 kV. The substation bus voltage at the source substation (BPA's McNary Substation) is 115 kV for service to UEC and the bus voltage of Hermiston Butte substation where the new line will terminate is 115 kV. Therefore, the line will be designed and insulated at 115 kV for compatibility purposes.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 5: Please describe controls UEC would use to keep this project on schedule and at or below budget.

Response

In order to keep this project on schedule and budget the following actions will be taken:

1. Preliminary design work has already been accomplished. Design work will be targeted to be completed within 30 days of approval of the Certificate of Public Convenience and Necessity by the OPUC. Final easement acquisition will be accomplished as expeditiously as possible.
2. Major equipment items requiring long lead times will be ordered so that equipment availability does not delay construction of the line and related substation improvements.
3. In order to accomplish the project within budget, the job will be bid out to multiple approved contractors utilizing standardized contract documents. Bid documents will detail the construction schedule and consequences if target dates are not met. The bid process is utilized to insure competitive prices for construction. Contract documents will be based on contract document 830 as published by the Rural Utilities Service (of the US Department of Agriculture).
4. UEC will have an engineer representative that will take on project management and responsibility for UEC. This person will be responsible for overseeing the procurement of materials, management of contractors, and ownership of the budget and schedule. There will be daily inspections and weekly progress reports to UEC management.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 10: For the proposed five-mile line as well as each of the two alternative routes, how many miles, per route, are *not* planned to use existing transmission corridors?

Response

The proposed line route is the only one of the three alternatives that utilizes an existing transmission corridor the length of the route with one minor exception at a road crossing. 2.9 miles of the West Alternative do not use existing transmission corridors. 4.8 miles of the East Alternative do not use existing transmission corridors.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 13: Please summarize the impacts, if any, to businesses located adjacent to the right of way and how UEC will minimize or mitigate these impacts.

Response

Potential impacts to businesses adjacent to the right of way include interruption of power and/or disturbances caused by the use of construction machinery. To minimize power outages during construction, the existing line will be left in service until the new proposed upgraded line is constructed and ready to be energized. By staging the construction and removal in this way, if a power outage is necessary, the duration of the outage will be minimized. The use of construction machinery in the right of way is unavoidable, but due to the typical progression of transmission line construction, the length of activity at each structure location on the right of way would be expected to be relatively short. UEC will work with individual property owners to minimize impediments to property access during construction.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 16: Please describe any biological assessments required to evaluate the potential environmental effects on listed and proposed species and critical habitat in the project area. If available, please describe the impacts on such species or habitats identified by applicable environmental assessments.

Response

UEC has reviewed US Fish and Wildlife ("USFW") Information for Planning and Conservation ("IPAC") requirements. Per USFW, there are 19 species that may be present in Umatilla County. These species are listed in the table below. The IPAC website does not list any critical habitats for those species in the UEC project area.

Species	Listing/Season
Fishes	
Bull Trout	Threatened
Mammals	
Gray Wolf	Endangered
Migratory Birds	
Bald Eagle	Year-round
Brewer's Sparrow	Breeding
Calliope Hummingbird	Breeding
Eared Grebe	Breeding
Ferruginous Hawk	Breeding
Flammulated Owl	Breeding
Fox Sparrow	Breeding
Loggerhead Shrike	Breeding
Long-billed Curlew	Breeding
Peregrine Falcon	Breeding
Rufous Hummingbird	Breeding
Sage Thrasher	Breeding
Short-eared Owl	Year-round
Swainson's Hawk	Breeding
Western Grebe	Breeding
White Headed Woodpecker	Year-round
Willow Flycatcher	Breeding

As of this date, none of the 17 migratory birds listed above appear on the list of "Oregon's Endangered Species" as listed by the Oregon Department of Fish and Wildlife (www.dfw.state.or.us).

Additionally, the area of UEC's proposed McNary-Hermiston Butte Line is almost exclusively along road right-of-ways and on already developed land between the cities of McNary and

Hermiston. Clearing of trees associated with construction will be minimal since easement areas are adjacent to road rights-of-way and on developed land between the cities of McNary and Hermiston.

The proposed infrastructure is similar to other electric facilities in the area and the existing line proposed to be upgraded to 115 kV already has structures that were originally designed for 69 kV transmission service.

For these reasons, UEC has concluded that the project will not have a negative impact on listed species, their habitats, or proposed or designated critical habitat.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 17: Do project costs include company mitigation on avian impacts, such as bird diverters on ground wires? If not, what are the costs of mitigations UEC has considered, if any?

Response

Project costs do include an amount for mitigation of avian impacts in the form of conductor covers installed at the crossarms on the distribution circuits, which help prevent bird electrocution. There have not been known bird collisions within the primary line route area. Should future events indicate the need for bird diverter assemblies, the estimated additional cost to install the bird diverters is approximately $50,000 per mile.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 18: Regarding UEC/100, Toth/6 lines 9-11, please provide monthly data by class, including: customer count, non-coincident peak demand, total demand, and reductions attributed to energy efficiency from 2011-2015. If any metric is not available by class or by month, please provide the next closest aggregation available. Please include this data in an excel file.

Response

Please see spreadsheet "Response 18 Attachment 1". Customer count by class is included as is system Non-Coincident Peak demands and reduction attributed to Energy Efficiency. Metered data regarding demand by class is not available. For kwh usages by class, by year, see "Response 18 Attachment 2".

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

Umatilla Electric Cooperative
Herminston, Oregon

Response to PUC Question 18

Customer Count by Class of Service

	Residential	Residential Seasonal	Irrigation	Comm. And Ind. 1000 kVA or Less	Comm. And Ind. Over 1000 kVA	Public Street & Highway Lighting	Total
2011	9,322	1,539	1,396	1,804	16	7	14,084
2012	9,398	1,563	1,416	1,852	18	7	14,254
2013	9,437	1,576	1,443	1,885	17	7	14,365
2014	9,510	1,560	1,465	1,909	20	7	14,471
2015	9,582	1,575	1,473	1,949	21	7	14,607

Source: Part O. Power Requirements Database - Annual Summary, Column (b) Average No. Consumers Served

Non-Coincident Peak Demand (kW)

Jan-11	161,822	Jan-12	144,186	Jan-13	160,986	Jan-14	160,319	Jan-15	319,680
Feb-11	161,257	Feb-12	124,472	Feb-13	121,644	Feb-14	167,282	Feb-15	256,926
Mar-11	132,377	Mar-12	120,352	Mar-13	128,122	Mar-14	169,623	Mar-15	317,225
Apr-11	157,005	Apr-12	211,411	Apr-13	154,413	Apr-14	179,101	Apr-15	286,317
May-11	170,330	May-12	227,259	May-13	203,302	May-14	239,774	May-15	351,353
Jun-11	236,494	Jun-12	220,970	Jun-13	231,338	Jun-14	265,585	Jun-15	395,233
Jul-11	247,398	Jul-12	244,228	Jul-13	256,840	Jul-14	319,383	Jul-15	444,881
Aug-11	251,043	Aug-12	239,742	Aug-13	237,599	Aug-14	298,095	Aug-15	399,728
Sep-11	224,044	Sep-12	213,593	Sep-13	251,858	Sep-14	248,767	Sep-15	332,015
Oct-11	143,932	Oct-12	144,127	Oct-13	216,912	Oct-14	262,472	Oct-15	486,341
Nov-11	175,362	Nov-12	157,081	Nov-13	229,882	Nov-14	281,660	Nov-15	498,203
Dec-11	183,384	Dec-12	138,254	Dec-13	188,915	Dec-14	251,688	Dec-15	279,079

Source: Monthly Power Bills from PGNC Power, Data is based on system non-coincident demands. Class data is not available.

Reductions Attributed to Energy Efficiency

2011	49,081
2012	16,678
2013	16,178
2014	52,278
2015	87,241

Source: Part P. Energy Efficiency Programs, Column (c) Estimated MMBTU Savings Added This Year. Class data not available.

Umatilla Electric Cooperative Association

Repsonse to Question 18 - Usage by Class by Year

Year Ending	Customer Class	kWh Sold
2011	Residential (Excl. Seasonal)	159,951,313
2011	Residential (Seasonal)	8,402,249
2011	Irrigation	274,832,225
2011	Comm/Ind. 1,000 KVA or Less	182,323,667
2011	Comm/Ind. Over 1,000 KVA	296,534,532
2011	Public Street & Hwy. Lighting	387,822
	Totals	922,431,808
2012	Residential (Excl. Seasonal)	156,415,333
2012	Residential (Seasonal)	7,961,557
2012	Irrigation	291,021,355
2012	Comm/Ind. 1,000 KVA or Less	166,986,534
2012	Comm/Ind. Over 1,000 KVA	350,609,087
2012	Public Street & Hwy. Lighting	387,110
2012	Totals	973,380,976
2013	Residential (Excl. Seasonal)	166,260,335
2013	Residential (Seasonal)	8,315,740
2013	Irrigation	307,091,497
2013	Comm/Ind. 1,000 KVA or Less	178,763,383
2013	Comm/Ind. Over 1,000 KVA	424,572,601
2013	Public Street & Hwy. Lighting	387,673
2013	Totals	1,085,391,229
2014	Residential (Excl. Seasonal)	161,976,987
2014	Residential (Seasonal)	8,303,503
2014	Irrigation	330,999,839
2014	Comm/Ind. 1,000 KVA or Less	182,530,033
2014	Comm/Ind. Over 1,000 KVA	663,266,193
2014	Public Street & Hwy. Lighting	388,818
2014	Totals	1,347,465,373
2015	Residential (Excl. Seasonal)	153,061,353
2015	Residential (Seasonal)	7,957,939
2015	Irrigation	334,977,416
2015	Comm/Ind. 1,000 KVA or Less	190,225,904
2015	Comm/Ind. Over 1,000 KVA	893,692,710
2015	Public Street & Hwy. Lighting	390,576
2015	Totals	1,580,305,898

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 20: Regarding UEC/100. Toth/6 lines 9, please explain why UEC expects the current growth trend to continue.

Response

UEC's total kwh usage and number of consumers has continued to increase each year since 2011. Those trends are reflected in the responses to PUC Staff DR 18 and PUC Staff DR 19. Based on these ongoing trends, growth is expected to continue to increase. UEC has had customer inquiries from all class sizes; from residential consumers to industry consumers. Area irrigation water allocations have increased through private projects developing and sponsored by local port authorities, local farms and farming organizations, and by the efforts of the Northeast Oregon Water Association. These projects have a projected increase of 500 cubic feet per second of water rights which will require an additional 35 MW of load through the year of 2020 for 21,000 HP of river station pumps, 7,500 HP of booster station pumps, and 13,500 HP of water pipeline intertie pumps. Existing river and booster stations served by the McNary and Hat Rock delivery points total HP rating is roughly 30,000 HP.

UEC provides reasonably priced power to member consumers. Its history, location with access to BPA transmission resources and continuing area growth in wind and solar resources provides an additional basis for ongoing growth in system electrical loading.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 24: Regarding UEC/104, Toth/1, please provide the Outage Report for McNary 115 kV line from 1996-2006.

Response

Please see spreadsheet "Response 24 Attachment 1."

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

1996-2006 Outage Report for McNary 115 kV Feeder #2

Customer Name	Line/POD Name	kV	OutDatetime	InDatetime	Dur Mins	Dispatch Cause	Field Cause
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	7/30/1997 20:40	7/30/1997 22:13	93	Not Reported	Human Element
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	6/24/1998 19:15	6/24/1998 20:25	70	Vehicle	Human Element
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	7/3/1998 13:22	7/3/1998 13:26	4	Terminal Equipment Failure	Lightning
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	7/3/1998 13:42	7/3/1998 15:12	90	Terminal Equipment Failure	Terminal Equipment Failure
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	8/12/2001 22:40	8/12/2001 23:56	76	Not Reported	Human Element
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	8/13/2001 1:32	8/13/2001 1:39	7	Not Reported	Human Element
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	1/30/2004 3:21	1/30/2004 5:05	104	Not Reported	Not Reported

Information Provided by BPA

2006-2016 Outage Report for McNary 115 kV Feeder #2

Customer Name	Line/POD Name	kV	OutDatetime	InDatetime	Dur Mins	Dispatch Cause	Field Cause
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	2/19/2016 14:07	2/19/2016 16:06	119	Unknown	Weather
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	9/29/2015 16:32	9/29/2015 18:34	122	Line Material Failure	Foreign Object
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	9/15/2013 17:34	9/15/2013 19:09	95	Not Reported	Not Reported
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	9/13/2013 4:12	9/13/2013 6:07	115	Not Reported	Not Reported
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	9/13/2013 2:18	9/13/2013 3:59	101	Not Reported	Not Reported
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	4/11/2012 15:25	4/11/2012 15:55	30	Unknown	Not Reported
Umatilla E Coop	McNary: Umatilla E Coop 115kV Feeder 2	115.0	5/19/2006 16:25	5/20/2006 0:24	479	Not Reported	Not Reported

Information Provided by BPA

Response 24 Attachment 1
Rev. 10/11/16

PCN 1 - Staff/102
Ihle/14

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 26: Clarence and Geraldine Charlo filed written comments in this proceeding noting that the proposed new easement would add almost ten additional feet running through their house. The Charlos comment, "The transmission lines will then be over a larger part of our house and we wonder about our safety." In regard to this comment:

a. Please provide the Company's response to the Charlos' comment;

b. If UEC agrees that the proposed line passes above the Charlos residence, please state whether the Company considered routing the proposed transmission line to avoid a route passing over the Charlos' residence. If so, please explain why the Company does not propose such a route.

Response

Contrary to the statement made in the Charlo letter, the power lines for the proposed project will **not** pass over the Charlo's house. The Charlo property is depicted on the aerial photograph in the pre-filed testimony of Louis S. Toth. See UEC/107, Toth/8. The easement UEC would like to obtain from the Charlos is only 25 feet in width, as shown by the yellow cross-hatched area on that figure. The easement is meant to limit future encroachments on the line in the area of the easement for safety. The proposed structures (poles) will be installed 2-5 feet inside the westernmost boundary of the easement. To prevent any overhang of the house, all conductors on this section of the line have been designed to be installed on the west side of those structures. The structures on this easement are designed so that the closest energized conductor will have a minimum of 19.8 feet of total clearance to the west corner of the house consisting of 7 feet of horizontal clearance and a minimum of 18.5 feet of vertical clearance.

The 2017 Edition of the National Electrical Safety Code (NESC) and Rural Utilities Service (RUS) Bulletin 1724E-200 have requirements for the amount of vertical clearance between a line and a building. The minimum vertical clearance required for safe operation by the NESC and RUS Bulletin 1724E-200 between the distribution line and a house is 12.5 feet. The minimum vertical clearance value used in the design of the proposed line, including for this property, is 18.5 feet, well in excess of NESC and RUS Bulletin 1724E-200 requirements. Having the easements in place will allow for the maintenance of the line and ensure that the required safe operating clearances can be maintained by the cooperative. By locating the poles outside the road right-of-way and within the power line easements, the membership will not be required to finance any future line modifications necessary to accommodate upgrades in the road right-of-way, thus gaining financial security.

Response Date: October 20, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

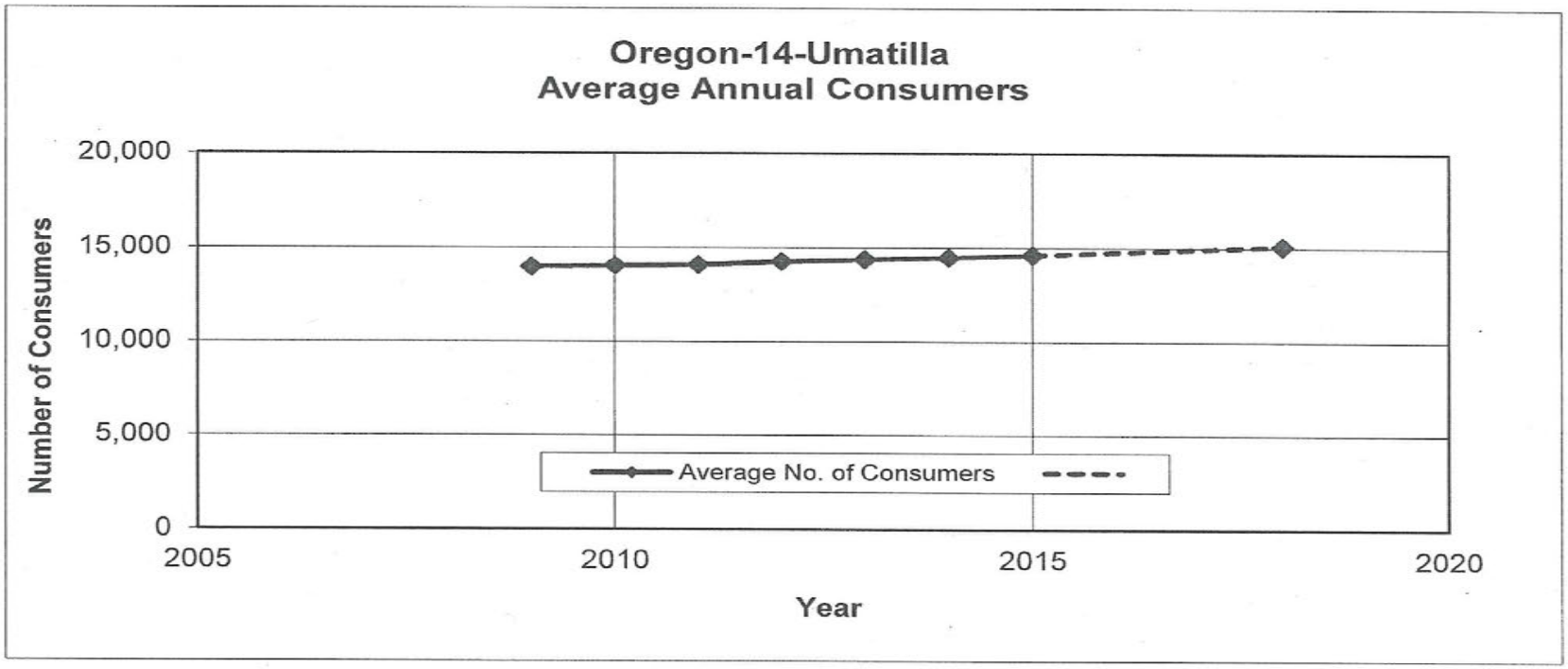
PUC Staff DR 32: Please provide the Company's current forecasts for customer load growth over the next ten years.

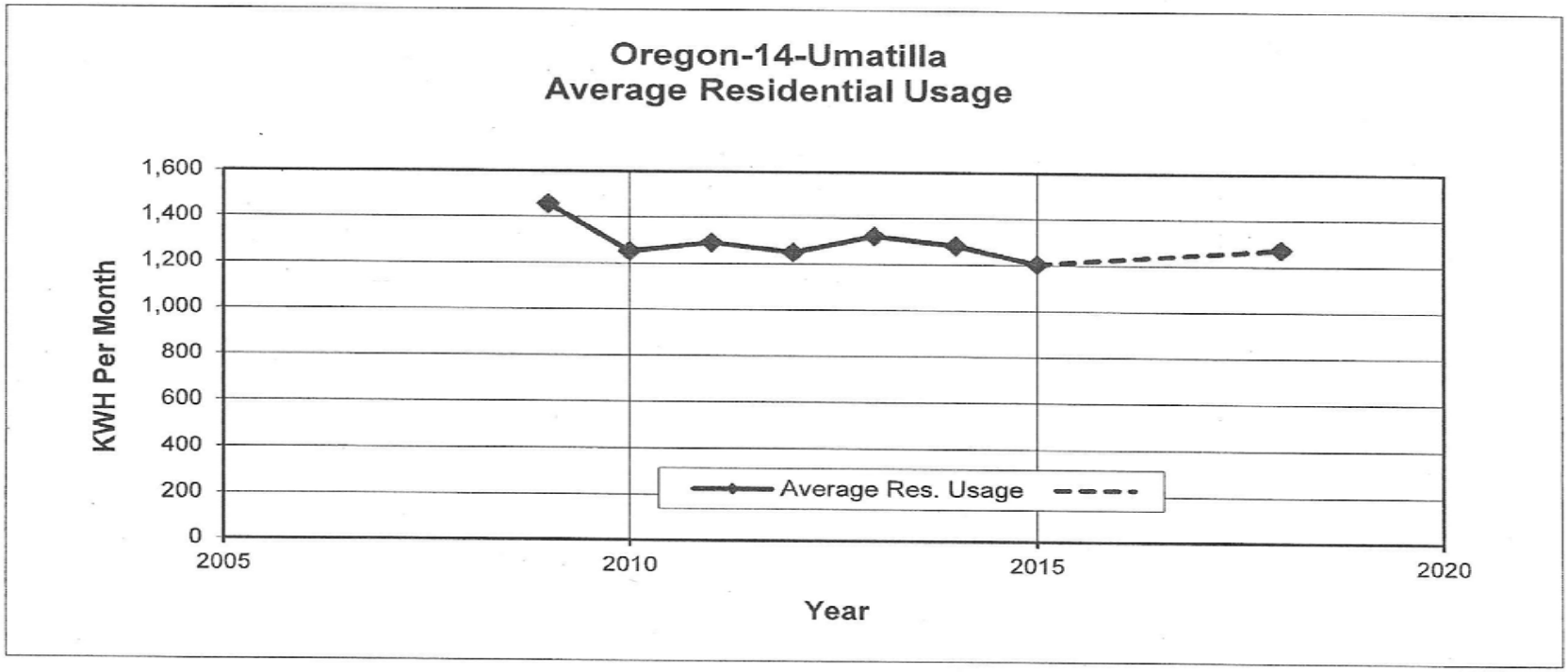
Response

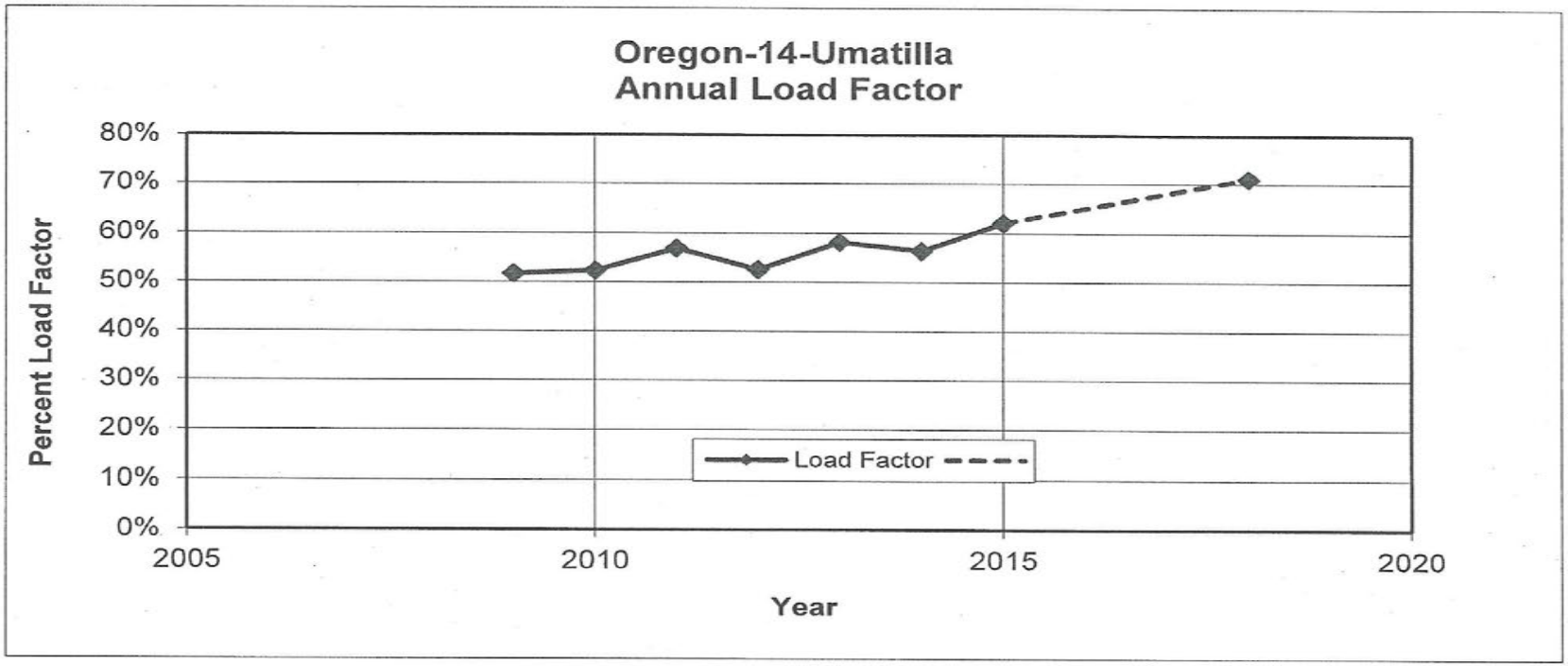
Please see documents "Response 32 Attachment 1" and "Response 32 Attachment 2."

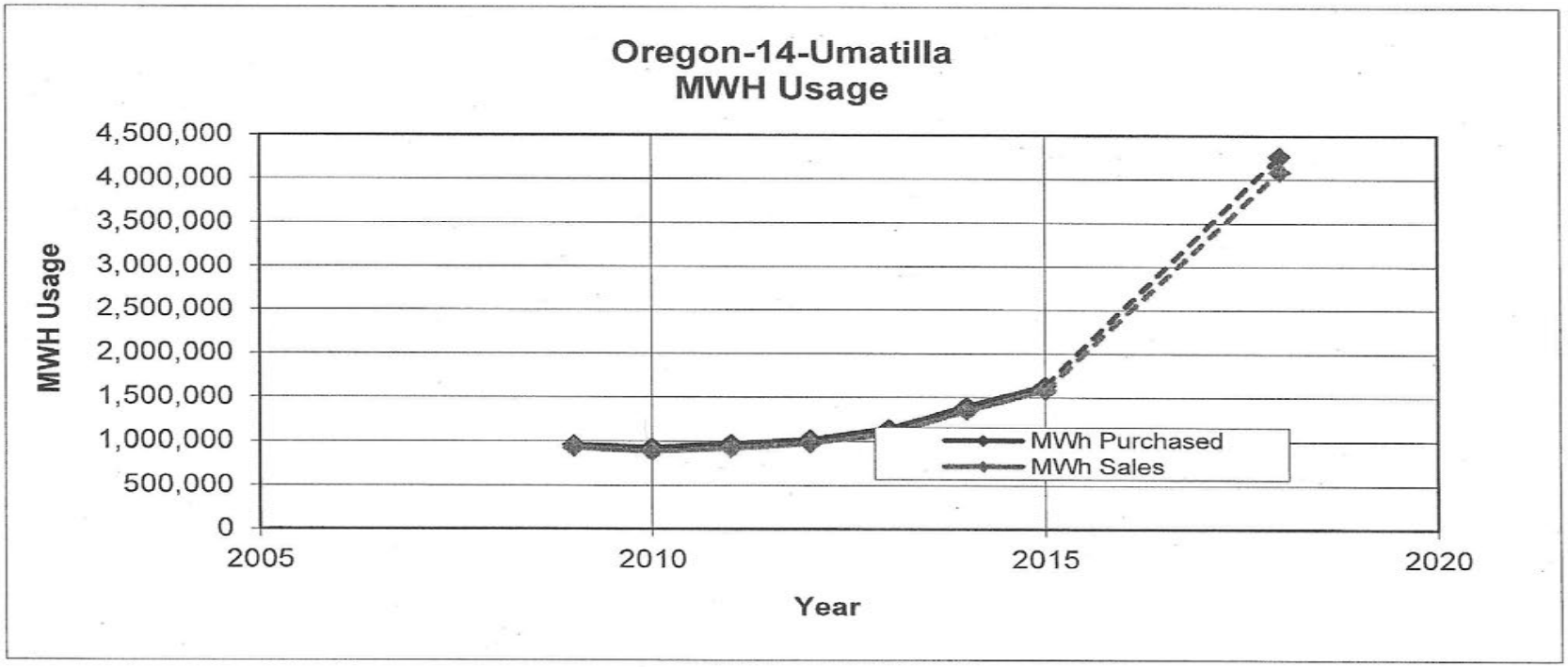
Response Date: October 20, 2016

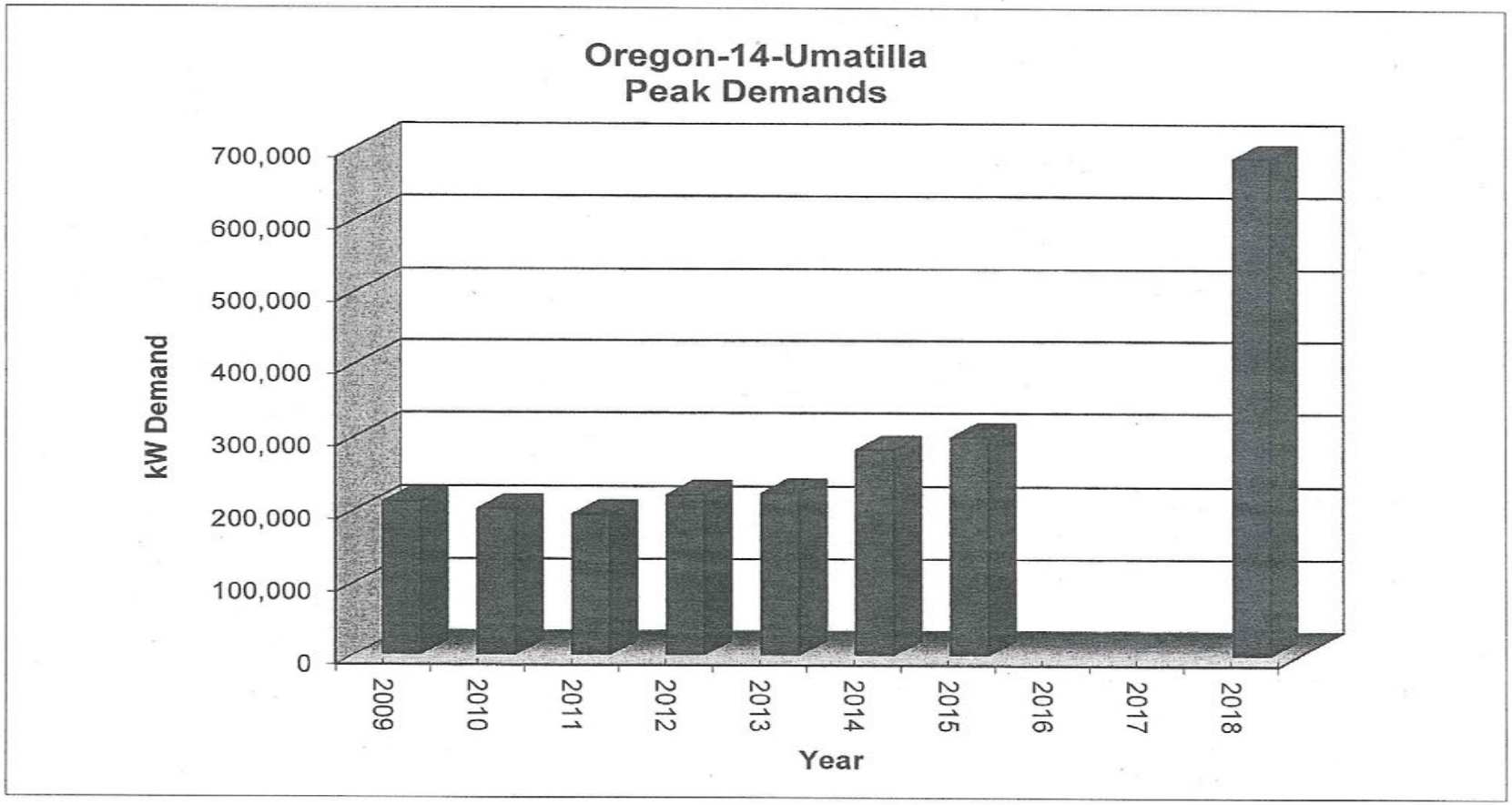
Witness Most Knowledgeable About Response: Louis S. Toth










Oregon-14-Umatilla
Peak Demands
kW Demand
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year

Oregon-14-Umatilla
Umatilla Electric Cooperative
Hermiston, Oregon

Summary of Load Data

Year	Purchases (MWH)[1]	Sales (MWH)[1]	Sum of Mo. Peak Demands[2]	Load Factor[1]	Average No. of Consumers	Average Res. Usage	Average Res. Customers
2009	958,800	926,838	211,793	51.68%	13,968	1,455	10,781
2010	927,408	883,081	202,441	52.30%	14,024	1,252	10,830
2011	970,453	922,432	194,752	56.88%	14,084	1,291	10,864
2012	1,022,506	973,381	221,906	52.60%	14,254	1,250	10,961
2013	1,141,456	1,085,391	224,285	58.10%	14,365	1,321	11,013
2014	1,400,039	1,347,465	283,504	56.37%	14,471	1,282	11,070
2015	1,635,668	1,580,306	300,690	62.10%	14,607	1,203	11,157
2018	4,265,981	4,087,303	685,787	71.01%	15,089	1,272	11,583

Comments:
(1) 2018 Purchases and Sales calculated from the forecast 2018 CWP Demand and the 2018 load factor in the 2014 Load Forecast Study

(2) The 2014 Load Forecast Study only included 190MW of 2018 forecast demand for the customer receiving power at Beach Access, Lewis & Clark, and Rippee Road. The Construction Work Plan forecast for demand at those three substations is 414MW.

Reference data - "2014 Load Forecast"

USDA
United States Department of Agriculture

Rural Development

USDA – RD – RUS – Electric

11471 Business Park BLVD, # 771876
Eagle River, AK
99577 - 1876

Voice 907-688-8732
Cell 907-244-2788
Fax 888-655-3357

October 8, 2014

Mr. M. Steven Eldrige
General Manager & CEO
Umatilla Electric Cooperative
PO Box 1148
Hermiston, OR 97838-3148

Subject: Ten Year Load Forecast 2014 – 2026 – Approval
Umatilla Electric Cooperative (OR 0014)

Dear Mr. Eldrige:

Please reference your memo to the Umatilla Board of Directors recommending approval, the subject Load Forecast (LF) for Umatilla Electric Cooperative along with your Board of Director's Certified Resolution# 2014 09 010 approving the LF (Dated – 09/24/14).

I have reviewed the Load Forecast for Umatilla Electric Cooperative. The methods and assumptions used are reasonable and therefore your forecast appears to be a realistic projection of future demand. The study was prepared pursuant to ongoing consultation with your staff.

In conformance with "Staff Instruction" 1700-1, Section II – Electric Program, Part 9, Dated April 2, 1998; and GFR duties; I am pleased to confirm Agency approval of Umatilla Electric Cooperative's 2014 – 2026, Ten Year Load Forecast for the purposes of transmission and distribution. The Load Forecast (LF) should be utilized to support future, construction work plans, long-range financial forecasts, loan applications, and other planning studies as appropriate. Obviously, other supporting documents will need to be compiled and forwarded to USDA – RUS for review and approval prior to approval of any future loan application.

The Load Forecast should be reviewed at least annually and compared with actual growth trends. It should be revised as necessary and, in any event, should be updated at least every three years.

I will today forward one signed copy of my letter of approval to the RUS Washington, DC headquarters office responsible for Load Forecast Studies to retain in their files. A second copy of the letter will be sent to the RUS Washington, DC headquarters department responsible for new loans. I will also retain the third copy of the letter, the Board Resolution and the Load Forecast for my files.

Mr. Eldrige, I commend the your efforts and that of your staff in preparing this study and appreciate all those at the Umatilla Electric Cooperative who extended many courtesies to me during the preparation and review of the Load Forecast Study.

Please contact me if you have any questions on this matter or if I can be of additional service to you. We look forward to working with you and your staff on your future loan application.

Sincerely,

Eric A. Marchegiani, P.E.
General Field Representative

cc: Mr. Victor Vu – DAA, OPMRA, w/o Attachment
Mr. Don Junta, OPMRA, w/o Attachment
Ms. Annie Holloway-Jones – DAA, OLOA w/o Attachment
Acting Operations Branch, Chief, w/o Attachment
Mr. Charles Philpott, Engineering Branch, Chief, w/ Attachment
Mr. Kevin Ince, CFO, Umatilla Electric Cooperative, w/o Attachment

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 36: See UEC/107 Toth/1-2. In UEC's initial filing, 19 parcels were identified as requiring easements that UEC had not yet obtained. Please update Exhibit UEC 107 and any other relevant exhibits to reflect any additional required easements that have been obtained by the Company since UEC's initial filing on August 19, 2016. This is an ongoing request.

Response:

Exhibit UEC/107

As UEC noted in the narrative and pre-filed testimony of its petition, and as further explained in UEC's Response to PUC Staff DR 23, UEC has continued to analyze the need to obtain easements for the transmission line and to work with property owners for that purpose. Since that time, the following changes have occurred:

1 - UEC has determined that the easement designated "Easement CU-811.1" is no longer needed. The original purpose of that easement was to facilitate moving a power line from the west side of Lind Road to the east side in that area. UEC has decided to not modify the existing line on the west side of the road and it can use an existing connection further to the south rather than utilize this easement for that purpose. This easement has therefore been removed from the exhibits, with corresponding changes in the table that originally appeared at Exhibit UEC/107, Toth/1, removal of the easement from the overview map that originally appeared at Exhibit UEC/107, Toth/3, removal of the specific easement figure that originally appeared at Exhibit UEC/107, Toth/9, and removal of the easement from the list of property owner addresses that originally appeared at Exhibit UEC/107, Toth/27.

2 – UEC has obtained from the landowner the easement designated "Easement CU-821." Accordingly, that easement is no longer highlighted as it was in the original version at Exhibit UEC 107, Toth/1, the easement now appears blue rather than yellow as it did in the original version at Exhibit UEC 107/Toth 4, the specific easement figure that originally appeared at Exhibit UEC/107, Toth 14 has been removed, and the owner's name and mailing address have been removed from the list of property owner addresses that originally appeared at Exhibit UEC/107, Toth/27.

3 – UEC discovered an error in its original depiction of "Easement CU-847." Specifically, that easement is identified in the original exhibits at Exhibit UEC/107, Toth/20 and shows an easement that is twenty-five feet (25') in width. In reality, UEC wishes to obtain an easement that is fifty feet (50') in width across that property. An early design anticipated that the transmission line might be able to be located adjacent to the road right-of-way on the west side of that property. When the final design was developed, however, it utilized the same location as the existing power line on that property, which is set back from the road right-of-way. While the

new alignment changed as part of the final design presented in UEC's petition, the need for a wider easement – one that does not utilize the road right-of-way – was not captured. The appropriately-sized easement is now included, with corresponding changes that include an expansion of the easement in the overview map that originally appeared at Exhibit UEC/107, Toth/5, and modification of the specific easement figure that originally appeared at Exhibit UEC/107, Toth/20. The easement value shown in the table that appears at Exhibit UEC/107, Toth/1 already reflected a fifty foot (50') wide easement and therefore does not require revision.

Included with this response is "Attachment DR 36-1" which reflects each of the changes described above and which supplants the original Exhibit UEC/107 filed with UEC's petition.

Exhibit UEC/108

In addition to changes to various easements described above, UEC has continued to refine the specific components of the transmission line along the proposed route. Included with its petition and the pre-filed testimony of Louis S. Toth, UEC provided figures showing the profile of the line and the specific structure types that would be installed along the route. See Exhibit UEC/108. As UEC continues to work with property owners along the route and develop more precise engineering drawing for the line, the information in Exhibit UEC/108 has changed. In response to this data request, UEC is also providing "Attachment DR 36-2" which reflects those changes and which supplants the original Exhibit UEC/108 filed with UEC's petition.

Some of the changes are the result of the need to avoid or to safely cross over existing facilities such as high pressure water lines or irrigation canals. Other changes are the result of further refinements to ensure the line satisfies applicable engineering requirements and safety standards. Many of the changes simply conform the labels used to denote structure type to the standard labels used by Rural Utility Services or add detail to the label for constructability purposes. Below is a list of each change made to the exhibit. The drawings have been condensed from 11 pages to 10 pages by maximizing space used on each page. The overall project length and scope have not changed.

- Str 3: Structure has been shifted north 35' to prevent encroachment on Bureau of Reclamation right-of-way.
- Str 9: Pole height has been decreased from 105' to 100' to accommodate the addition of structure 10.1 near the 69 kV line crossing at Power City Road.
- Str 9: Unit CS6.72F has been renamed to CS6.72F (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 10: Pole height has been decreased from 115' to 105' to accommodate the addition of structure 10.1.
- Str 10.1: This structure has been added to shorten the span and reduce the sag of the proposed line at the 69 kV line crossing near Power City Road.
- Str 11: Pole height has been decreased from 115' to 105' to accommodate the addition of structure 10.1.
- Str 11: Structure has been shifted south 16' to prevent encroachment on Bureau of Reclamation right-of-way.

- Str 11: Unit AS5.21A has been renamed to AS5.21A (#4 Copper) to describe the type of existing distribution wire attached to the unit.
- Str 12: Pole height has been decreased from 105' to 100' to accommodate the addition of structure 10.1.
- Str 12: TM-4G(OPGW) units have been removed. These were additional attachment units used for the static wire. They are no longer needed with the addition of structure 10.1.
- Str 14: Structure class has been increased from H5 to H6 for additional pole strength.
- Str 15: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 18: Structure class has been increased from H5 to H6 for additional pole strength.
- Str 20: Unit TH-15E has been changed to TH-5AB to correspond with typical RUS drawing designations.
- Str 21: Unit TH-15DA has been changed to TH-5AD to correspond with typical RUS drawing designations.
- Str 22: Unit TH-15F has been changed to TH-5AC to correspond with typical RUS drawing designations.
- Str 25: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 27: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 27: Unit A6.21 has been renamed to A6.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 30: Unit A5.21 has been renamed to A5.21 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 34: Stub pole class has been decreased from 1 to 3 for optimization.
- Str 35: Structure has been modified to be self-supporting. The pole material has been changed from wood to steel and the stub pole (unit 30-1) and guy wires have been removed. All other units have been adjusted to their steel counterparts. These changes were made to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 36: Unit CS1.41P-A has been adjusted to CS1.41P to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 37: Unit CS1.41P-A has been adjusted to CS1.41P to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 38: Structure has been shifted 81' south to avoid interference with a high pressure water line.
- Str 39: Structure has been modified to be self-supporting. The pole material has been changed from wood to steel and guy wires have been removed. All other units have been adjusted to their steel counterparts. These changes were made to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 40: Structure has been shifted 8' north to increase clearance on span between 39 and 40.
- Str 46: TM-4G(OPGW) units have been removed. These were additional attachment units needed for the static wire to facilitate splicing the static. The splice has been moved and these units are no longer needed on this structure.
- Str 49: Unit C1.41P has been replaced with S2.32A. This modification adds distribution switches to the pole.
- Str 55: Stub pole class has been increased from 3 to 2 for additional pole strength.
- Str 55: Unit C6.72F has been renamed to C6.72F (123 AAAC) to describe the type of existing distribution wire attached to the unit.

- Str 60: One of the C1.41P units has been renamed to C1.41P (1/0 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 69: Unit A5.21 has been renamed to A5.21 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 70: Unit A5.21 has been renamed to A5.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 71: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 72: Unit A5.21 has been renamed to A5.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 76: Distribution circuit coming into structure from north has been moved up to attach to top circuit running south.
- Str 77: Unit C5.72 has been renamed to C5.72 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 80: Unit C5.72 has been renamed to C5.72 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 82: Unit CS5.72 has been renamed to CS5.72B (#4 ACSR) to describe the type of existing distribution wire attached to the unit and adjust the tap line configuration.
- Str 85: Unit CS5.72A has been renamed to CS5.72A (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 90: Structure has been shifted north 26' to prevent encroachment on Bureau of Reclamation right-of-way.
- Str 95: A communication line that ends on structure 94 now ends on structure 95.

Response Date: November 4, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

Butte-McNary Easement Tabulation

Required easements are highlighted and shown with estimated values

PAGE #	TAX LOT #	OWNER	EASEMENT VALUE	ZONING
CU-802	200	SCHELL, JAMES	$ 1,680.17	C-1
CU-803	100	ANACAPA LAND CO., LLC	$ 743.92	F-2
CU-804	3902	POULSON, STEVEN & JONILYN	$ 971.02	R-1
CU-805	3900	RITZER, MICHAEL & TABITHA	$ 788.54	R-1
CU-806	3700	FREDERICKSON, DARYL & JUNE	$ 782.58	R-1
CU-807	3600	FREDERICKSON, DARYL & JUNE	$ 500.00	R-1
CU-808	4090	CHARLO, CLARENCE & GERALDINE	$ 928.63	R-1
CU-809	4091	MORRIS, KENNETH LEON & MARCIA DAWN	$ 500.00	R-1
CU-810	4100	MORRIS, KENNETH LEON & MARCIA DAWN	$ 500.00	R-1
CU-811	1700	BARRETO, GUADALUPE	$ 500.00	R-3
CU-812	1800	ARTEAGA, MANUAL & EVA	$ 500.00	R-3
CU-813	1900	WALLACE, JOHN & BARBARA	$ 500.00	R-3
CU-814	2000	FORDICE, CLINTON	$ 506.02	M-1
CU-815	2003	GARCIA, BUSTILLO SOILO	$ 1,069.56	M-1
CU-816	700	ESTATE OF STUART BONNEY	$ 992.49	M-1
CU-816.1	100	ESTATE OF STUART BONNEY	$ 500.00	M-1
CU-817	1600	ESTATE OF STUART BONNEY	$ 500.00	M-1
CU-817.1	1402	RANNE, DONALD	$ 500.00	R-1
CU-818	1800	WILLIAMS, RONALD	$ 500.00	M-1
CU-819	1900	ESTATE OF STUART BONNEY	$ 671.93	M-1
CU-820	2100	BURNS, PAUL	$ 571.82	M-1
CU-821	2300	UMATILLA COUNTY	$ 500.00	M-1
CU-822	1100	LOGSDON, NORRIS	$ 1,786.70	LI/AR
CU-822.1	100	UNITED STATES OF AMERICA	$ -	LI
CU-823.1	1400	RONALD BUWALDA	$ 500.00	LI
CU-825	110	JACKSON, STEVE	$ 552.69	LI
CU-826	100	SCHNELL, JOHN C	$ 980.13	LI
CU-827	300	DELHUR INDUSTRIES INC	$ 500.00	LI
CU-828	106	LUKENBILL, RICK R & DIANE	$ 1,814.86	LI
CU-829	703	GONLAZEZ , JUAN D SR & ORALIA M	$ 500.00	LI
CU-830	600	NOLAND, RONALD E & CINDY L	$ 1,804.98	LI
CU-831	701	PECK, BURTON H	$ 500.00	LI
CU-832	700	DRISCOLL, JOHN M & CAROLE L	$ 1,593.86	LI
CU-833	705	DRISCOLL, JOHN M & CAROLE L	$ 1,784.03	LI
CU-834	800	MEDELEZ TRUCKING INC	$ 1,875.46	LI
CU-835	405	RAMIREZ, GERARDO	$ 500.00	LI
CU-836	200	RAMIREZ, GERARDO	$ 500.00	LI
CU-837	407	DIAMOND M RANCH	$ 633.39	RR-4
CU-838	601	BAILEY, WENDELL C JR.	$ 1,138.70	RR-4
CU-842	301	UMATILLA COUNTY	$ 500.00	RR-2
CU-843	105	WARD, CHRIS & KATRINA	$ 1,093.67	RR-2
CU-844	302	MELVILLE JR, DAVID K & AMANDA	$ 500.00	RR-2
CU-845	300	COCHELL, WILLIAM L & IDA M	$ 882.65	RR-2
CU-846	110	SHAFFER, TED J & BARBARA	$ 931.95	RR-2
CU-847	1900	GARCIA, JOSE & REBECA	$ 737.28	RR-2
CU-848	1903	KYLE, JAMES C & RACIL M	$ 1,395.93	RR-2
CU-848.1	1905	MARTIN, PAMELA	$ 500.00	RR-2
CU-849	1904	DIRCKSEN, CRAIG A & HEATHER M	$ 1,408.11	RR-2
CU-850	500	NEWMAN & DACK	$ 741.25	R-4
CU-852	7500	MCDOUGAL, NORMAN	$ 500.00	R-4
CU-853	800	DUBOIS, JOEL & GLORIA	$ 500.00	R-4
CU-854	4000	CITY OF HERMISTON	$ 500.00	R-4

Butte-McNary Easement Tabulation

Required easements are highlighted and shown with estimated values

PAGE #	TAX LOT #	OWNER	EASEMENT VALUE	ZONING
CU-855	4100	MCDOUGAL, NORMAN	$ 500.00	R-4
CU-857	4200	JOHNSON, JOHN V JR & PAMELA J	$ 500.00	R-4
CU-858	201	MARK LARSON	$ 500.00	R-4
CU-859	200	COLVIN	$ 500.00	R-4
CU-860	202	WEBB, JEFFREY S & BRENDA	$ 500.00	R-4
CU-861	300	HALL, DONALD & DEBRA	$ 522.71	R-4
CU-862	500	DUMLER, CONRAD & JAIMEE	$ 500.00	R-4
CU-863	600	WERNER, HARLEY & CASON, MATTIE J (TRS)	$ 1,568.58	R-4
CU-864	400	BARLOW, RICK & RALPH & BERTHA (Berta)	$ 500.00	R-4
CU-865	1302	CITY OF HERMISTON	$ 500.00	M-1
CU-866	1401	AUTRY, LINDA R	$ 500.00	M-1
CU-867	1400	BRODERICK, THOMAS R	$ 500.00	M-1
CU-868	1403	ALLEMAN, DONALD & JACQUELINE	$ 535.53	M-1
CU-869	1402	THORPE, LARRY & CAROL	$ 500.00	M-1
CU-871	1309	BUSH, LLC	$ 500.00	M-1
CU-872	1311	HUXOLL, TOMMY L	$ 500.00	M-1
CU-873	2600	HUXOLL, TOMMY L	$ 500.00	M-1
CU-874	902	JUAN & MELBA ALMAGUER, JR.	$ 500.00	M-1
CU-875	1201	KOPACZ, RAYMOND & SHERRIE	$ 500.00	C-2

Total	$	52,989.13
Contingency (10%)	$	5,298.91
Grand Total	$	58,288.04
Rounded Total	$	59,000.00

The value of required easements not yet obtained (highlighted) total $11,589.12. Obtained easement values total $41,400.01.

CASE: PCN 1
WITNESS: GEOFFREY IHLE

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 103

Exhibits in Support of
Cross-Answering Testimony

November 10, 2016

Oregon's Statewide Planning Goals & Guidelines

GOAL 1: CITIZEN INVOLVEMENT

OAR 660-015-0000(1)

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

The governing body charged with preparing and adopting a comprehensive plan shall adopt and publicize a program for citizen involvement that clearly defines the procedures by which the general public will be involved in the on-going land-use planning process.

The citizen involvement program shall be appropriate to the scale of the planning effort. The program shall provide for continuity of citizen participation and of information that enables citizens to identify and comprehend the issues.

Federal, state and regional agencies and special-purpose districts shall coordinate their planning efforts with the affected governing bodies and make use of existing local citizen involvement programs established by counties and cities.

The citizen involvement program shall incorporate the following components:

1. Citizen Involvement -- To provide for widespread citizen involvement.

The citizen involvement program shall involve a cross-section of affected citizens in all phases of the planning process. As a component, the program for citizen involvement shall include an officially recognized committee for citizen involvement (CCI) broadly representative of geographic areas and interests related to land use and land-use decisions. Committee members shall be selected by an open, well-publicized public process.

The committee for citizen involvement shall be responsible for assisting the governing body with the development of a program that promotes and enhances citizen involvement in land-use planning, assisting in the implementation of the citizen involvement program, and evaluating the process being used for citizen involvement.

If the governing body wishes to assume the responsibility for, development as well as adoption and implementation of the citizen involvement program or to assign such responsibilities to a planning commission, a letter shall be submitted to the Land Conservation and Development Commission for the state Citizen Involvement Advisory Committee's review and recommendation stating the rationale for selecting this option, as well as indicating the mechanism to be used for an evaluation of the citizen involvement program. If the planning commission is to be used in lieu of an independent CCI, its members shall be selected by an open, well-publicized public process.

Oregon's Statewide Planning Goals & Guidelines

GOAL 2: LAND USE PLANNING

OAR 660-015-0000(2)

PART I -- PLANNING

To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

City, county, state and federal agency and special district plans and actions related to land use shall be consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268.

All land use plans shall include identification of issues and problems, inventories and other factual information for each applicable statewide planning goal, evaluation of alternative courses of action and ultimate policy choices, taking into consideration social, economic, energy and environmental needs. The required information shall be contained in the plan document or in supporting documents. The plans, supporting documents and implementation ordinances shall be filed in a public office or other place easily accessible to the public. The plans shall be the basis for specific implementation measures. These measures shall be consistent with and adequate to carry out the plans. Each plan and related implementation measure shall be coordinated with the plans of affected governmental units.

All land-use plans and implementation ordinances shall be adopted by the governing body after public hearing and shall be reviewed and, as needed, revised on a periodic cycle to take into account changing public policies and circumstances, in accord with a schedule set forth in the plan. Opportunities shall be provided for review and comment by citizens and affected governmental units during preparation, review and revision of plans and implementation ordinances.

Affected Governmental Units -- are those local governments, state and federal agencies and special districts which have programs, land ownerships, or responsibilities within the area included in the plan.

Comprehensive Plan -- as defined in ORS 197.015(5).

Coordinated -- as defined in ORS 197.015(5). Note: It is included in the definition of comprehensive plan.

Implementation Measures -- are the means used to carry out the plan. These are of two general types: (1) management implementation measures such as ordinances, regulations or project plans, and (2) site or area specific implementation measures such as permits and grants for construction, construction of public facilities or provision of services.

Plans -- as used here encompass all plans which guide land-use decisions, including both comprehensive and single-purpose plans of cities, counties, state and federal agencies and special districts.

Oregon's Statewide Planning Goals & Guidelines

GOAL 3: AGRICULTURAL LANDS

OAR 660-015-0000(3)

To preserve and maintain agricultural lands.

Agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest and open space and with the state's agricultural land use policy expressed in ORS 215.243 and 215.700.

USES

Counties may authorize farm uses and those nonfarm uses defined by commission rule that will not have significant adverse effects on accepted farm or forest practices.

IMPLEMENTATION

Zoning applied to agricultural land shall limit uses which can have significant adverse effects on agricultural and forest land, farm and forest uses or accepted farming or forest practices.

Counties shall establish minimum sizes for new lots or parcels in each agricultural land designation. The minimum parcel size established for farm uses in farmland zones shall be consistent with applicable statutes. If a county proposes a minimum lot or parcel size less than 80 acres, or 160 acres for rangeland, the minimum shall be appropriate to maintain the existing commercial agricultural enterprise within the area and meet the requirements of ORS 215.243.

Counties authorized by ORS 215.316 may designate agricultural land as marginal land and allow those uses and land divisions on the designated marginal land as allowed by law.

LCDC shall review and approve plan designations and revisions to land use regulations in the manner provided by ORS Chapter 197.

DEFINITIONS

Agricultural Land -- in western Oregon is land of predominantly Class I, II, III and IV soils and in eastern Oregon is land of predominantly Class I, II, III, IV, V and VI soils as identified in the Soil Capability Classification System of the United States Soil Conservation Service, and other lands which are suitable for farm use taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land-use patterns, technological and energy inputs required, or accepted farming practices. Lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands, shall be included as agricultural land in any event.

More detailed soil data to define agricultural land may be utilized by local governments if such data permits achievement of this goal.

Agricultural land does not include land within acknowledged urban growth boundaries or land within acknowledged exceptions to Goals 3 or 4.

Oregon's Statewide Planning Goals & Guidelines

GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES

OAR 660-015-0000(5)
(Please Note: Amendments Effective 08/30/96)

To protect natural resources and conserve scenic and historic areas and open spaces.

Local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability.

The following resources shall be inventoried:

a. Riparian corridors, including water and riparian areas and fish habitat;
b. Wetlands;
c. Wildlife Habitat;
d. Federal Wild and Scenic Rivers;
e. State Scenic Waterways;
f. Groundwater Resources;
g. Approved Oregon Recreation Trails;
h. Natural Areas;
i. Wilderness Areas;
j. Mineral and Aggregate Resources;
k. Energy sources;
l. Cultural areas.

Local governments and state agencies are encouraged to maintain current inventories of the following resources:

a. Historic Resources;
b. Open Space;
c. Scenic Views and Sites.

Following procedures, standards, and definitions contained in commission rules, local governments shall determine significant sites for inventoried resources and develop programs to achieve the goal.

GUIDELINES FOR GOAL 5

A. PLANNING

1. The need for open space in the planning area should be determined, and standards developed for the amount, distribution, and type of open space.

2. Criteria should be developed and utilized to determine what uses are consistent with open space values and to evaluate the effect of converting open space lands to inconsistent uses. The maintenance and development of open space in urban areas should be encouraged.

3. Natural resources and required sites for the generation of energy (i.e. natural gas, oil, coal, hydro, geothermal, uranium, solar and others) should be conserved and protected;

Oregon's Statewide Planning Goals & Guidelines

GOAL 6: AIR, WATER AND LAND RESOURCES QUALITY

OAR 660-015-0000(6)

To maintain and improve the quality of the air, water and land resources of the state.

All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules and standards. With respect to the air, water and land resources of the applicable air sheds and river basins described or included in state environmental quality statutes, rules, standards and implementation plans, such discharges shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources.

Waste and Process Discharges -- refers to solid waste, thermal, noise, atmospheric or water pollutants, contaminants, or products therefrom. Included here also are indirect sources of air pollution which result in emissions of air contaminants for which the state has established standards.

GUIDELINES

A. PLANNING

1. Plans should designate alternative areas suitable for use in controlling pollution including but not limited to waste water treatment plants, solid waste disposal sites and sludge disposal sites.

2. Plans should designate areas for urban and rural residential use only where approvable sewage disposal alternatives have been clearly identified in such plans.

3. Plans should buffer and separate those land uses which create or lead to conflicting requirements and impacts upon the air, water and land resources.

4. Plans which provide for the maintenance and improvement of air, land and water resources of the planning area should consider as a major determinant the carrying capacity of the air, land and water resources of the planning area. The land conservation and development actions provided for by such plans should not exceed the carrying capacity of such resources.

5. All plans and programs affecting waste and process discharges should be coordinated within the applicable air sheds and river basins described or included in state environmental quality statutes, rules, standards and implementation plan.

6. Plans of state agencies before they are adopted should be coordinated with and reviewed by local agencies with respect to the impact of these plans on the air, water and land resources in the planning area.

Adopted September 28, 2001
Effective June 1, 2002

Oregon's Statewide Planning Goals and Guidelines
GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS

To protect people and property from natural hazards.

A. NATURAL HAZARD PLANNING

1. Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.

2. Natural hazards for purposes of this goal are: floods (coastal and riverine), landslides,[1] earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.

B. RESPONSE TO NEW HAZARD INFORMATION

1. New hazard inventory information provided by federal and state agencies shall be reviewed by the Department in consultation with affected state and local government representatives.
2. After such consultation, the Department shall notify local governments if the new hazard information requires a local response.
3. Local governments shall respond to new inventory information on natural hazards within 36 months after being notified by the Department of Land Conservation and Development, unless extended by the Department.

C. IMPLEMENTATION

Upon receiving notice from the Department, a local government shall:

1. Evaluate the risk to people and property based on the new inventory information and an assessment of:
   a. the frequency, severity and location of the hazard;
   b. the effects of the hazard on existing and future development;
   c. the potential for development in the hazard area to increase the frequency and severity of the hazard; and
   d. the types and intensities of land uses to be allowed in the hazard area.
2. Allow an opportunity for citizen review and comment on the new inventory information and the results of the evaluation and incorporate such information into the comprehensive plan, as necessary.
3. Adopt or amend, as necessary, based on the evaluation of risk, plan policies and implementing measures consistent with the following principles:
   a. avoiding development in hazard areas where the risk to people and property cannot be mitigated; and
   b. prohibiting the siting of essential facilities, major structures, hazardous facilities and special occupancy structures, as defined in the state building code (ORS 455.447(1) (a)(b)(c) and (e)), in identified hazard areas, where the risk to public safety cannot be mitigated, unless an essential facility is needed within a hazard area in order to provide essential emergency response services in a timely manner.[2]
4. Local governments will be deemed to comply with Goal 7 for coastal and riverine flood hazards by adopting and

[1] For "rapidly moving landslides," the requirements of ORS 195.250-195.275 (1999 edition) apply.

[2] For purposes of constructing essential facilities, and special occupancy structures in tsunami inundation zones, the requirements of the state building code - ORS 455.446 and 455.447 (1999 edition) and OAR chapter 632, division 5 apply.

Oregon's Statewide Planning Goals & Guidelines
GOAL 8: RECREATIONAL NEEDS
OAR 660-015-0000(8)

To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

RECREATION PLANNING

The requirements for meeting such needs, now and in the future, shall be planned for by governmental agencies having responsibility for recreation areas, facilities and opportunities: (1) in coordination with private enterprise; (2) in appropriate proportions; and (3) in such quantity, quality and locations as is consistent with the availability of the resources to meet such requirements. State and federal agency recreation plans shall be coordinated with local and regional recreational needs and plans.

DESTINATION RESORT SITING

Comprehensive plans may provide for the siting of destination resorts on rural lands subject to the provisions of state law, including ORS 197.435 to 197.467, this and other Statewide Planning Goals, and without an exception to Goals 3, 4, 11, or 14.

Eligible Areas

(1) Destination resorts allowed under the provisions of this goal must be sited on lands mapped as eligible by the affected county. A map adopted by a county may not allow destination resorts approved under the provisions of this goal to be sited in any of the following areas:

(a) Within 24 air miles of an urban growth boundary with an existing population of 100,000 or more unless residential uses are limited to those necessary for the staff and management of the resort;

(b) On a site with 50 or more contiguous acres of unique or prime farm land identified and mapped by the United States Natural Resources Conservation Service or its predecessor agency; or within three miles of a High Value Crop Area except that "small destination resorts" may not be closer to a high value crop area than one-half mile for each 25 units of overnight lodging or fraction thereof;

(c) On predominantly Cubic Foot Site Class 1 or 2 forest lands, as determined by the State Forestry Department, that are not subject to an approved goal exception;

(d) In the Columbia River Gorge National Scenic Area as defined by the Columbia River Gorge National Scenic Act, P.L. 99-663;

(e) In an especially sensitive big game habitat as generally mapped by the Oregon Department of Fish and Wildlife in July 1984 and as further refined through development of comprehensive plans implementing this requirement.

Oregon's Statewide Planning Goals & Guidelines

GOAL 9: ECONOMIC DEVELOPMENT

OAR 660-015-0000(9)

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Comprehensive plans and policies shall contribute to a stable and healthy economy in all regions of the state. Such plans shall be based on inventories of areas suitable for increased economic growth and activity after taking into consideration the health of the current economic base; materials and energy availability and cost; labor market factors; educational and technical training programs; availability of key public facilities; necessary support facilities; current market forces; location relative to markets; availability of renewable and non-renewable resources; availability of land; and pollution control requirements.

Comprehensive plans for urban areas shall:

1. Include an analysis of the community's economic patterns, potentialities, strengths, and deficiencies as they relate to state and national trends;
2. Contain policies concerning the economic development opportunities in the community;
3. Provide for at least an adequate supply of sites of suitable sizes, types, locations, and service levels for a variety of industrial and commercial uses consistent with plan policies;
4. Limit uses on or near sites zoned for specific industrial and commercial uses to those which are compatible with proposed uses.

In accordance with ORS 197.180 and Goal 2, state agencies that issue permits affecting land use shall identify in their coordination programs how they will coordinate permit issuance with other state agencies, cities and counties.

GUIDELINES

A. PLANNING

1. A principal determinant in planning for major industrial and commercial developments should be the comparative advantage of the region within which the developments would be located. Comparative advantage industries are those economic activities which represent the most efficient use of resources, relative to other geographic areas.
2. The economic development projections and the comprehensive plan which is drawn from the projections should take into account the availability of the necessary natural resources to support the expanded industrial development and associated populations. The plan should also take into account the social, environmental, energy, and economic impacts upon the resident population.

Oregon's Statewide Planning Goals & Guidelines

GOAL 11: PUBLIC FACILITIES AND SERVICES

OAR 660-015-0000(11)

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

Urban and rural development shall be guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable, and rural areas to be served. A provision for key facilities shall be included in each plan. Cities or counties shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. To meet current and long-range needs, a provision for solid waste disposal sites, including sites for inert waste, shall be included in each plan.

Counties shall develop and adopt community public facility plans regulating facilities and services for certain unincorporated communities outside urban growth boundaries as specified by Commission rules.

Local Governments shall not allow the establishment or extension of sewer systems outside urban growth boundaries or unincorporated community boundaries, or allow extensions of sewer lines from within urban growth boundaries or unincorporated community boundaries to serve land outside those boundaries, except where the new or extended system is the only practicable alternative to mitigate a public health hazard and will not adversely affect farm or forest land.

Local governments may allow residential uses located on certain rural residential lots or parcels inside existing sewer district or sanitary authority boundaries to connect to an existing sewer line under the terms and conditions specified by Commission rules.

Local governments shall not rely upon the presence, establishment, or extension of a water or sewer system to allow residential development of land outside urban growth boundaries or unincorporated community boundaries at a density higher than authorized without service from such a system.

In accordance with ORS 197.180 and Goal 2, state agencies that provide funding for transportation, water supply, sewage and solid waste facilities shall identify in their coordination programs how they will coordinate that funding with other state agencies and with the public facility plans of cities and counties.

A Timely, Orderly, and Efficient Arrangement – refers to a system or plan that coordinates the type, locations and delivery of public facilities and services in a manner that best supports the existing and proposed land uses.

Oregon's Statewide Planning Goals & Guidelines

GOAL 13: ENERGY CONSERVATION

OAR 660-015-0000(13)

To conserve energy.

Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.

GUIDELINES

A. PLANNING

1. Priority consideration in land use planning should be given to methods of analysis and implementation measures that will assure achievement of maximum efficiency in energy utilization.

2. The allocation of land and uses permitted on the land should seek to minimize the depletion of non-renewable sources of energy.

3. Land use planning should, to the maximum extent possible, seek to recycle and re-use vacant land and those uses which are not energy efficient.

4. Land use planning should, to the maximum extent possible, combine increasing density gradients along high capacity transportation corridors to achieve greater energy efficiency.

5. Plans directed toward energy conservation within the planning area should consider as a major determinant the existing and potential capacity of the renewable energy sources to yield useful energy output. Renewable energy sources include water, sunshine, wind, geothermal heat and municipal, forest and farm waste. Whenever possible, land conservation and development actions provided for under such plans should utilize renewable energy sources.

B. IMPLEMENTATION

1. Land use plans should be based on utilization of the following techniques and implementation devices which can have a material impact on energy efficiency:

a. Lot size, dimension, and siting controls;

b. Building height, bulk and surface area;

c. Density of uses, particularly those which relate to housing densities;

d. Availability of light, wind and air;

e. Compatibility of and competition between competing land use activities; and

f. Systems and incentives for the collection, reuse and recycling of metallic and nonmetallic waste.

CASE: PCN 1
WITNESS: SCOTT GIBBENS

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 200

Staff Testimony

November 10, 2016

Q. Please state your name, occupation, and business address.

A. My name is Scott Gibbens. I am a Senior Economist employed in the Energy Rates, Finance and Audit Division of the Public Utility Commission of Oregon (OPUC). My business address is 201 High Street SE, Suite 100, Salem, Oregon 97301.

Q. Please describe your educational background and work experience.

A. My witness qualification statement is found in Exhibit Staff/201.

Q. What is the purpose of your testimony?

A. My testimony responds to the opening testimony in PCN 1 filed by Louis S. Toth and Robert Echenrode on behalf of Umatilla Electric Cooperative (UEC). My testimony specifically addresses Staff's analysis regarding the Safety and Justification of UEC's application for a Certificate of Public Convenience and Necessity (CPCN).

Q. Did you prepare an exhibit for this docket?

A. Yes. I prepared the following exhibits:

- Staff Exhibit 201 : Witness Qualification
- Staff Exhibit 202: UEC's response to Staff DR 2, 14, 16, 26, 30, 34, 36
- Staff Exhibit 203: UEC's Electrical Facility Inspection policy, Line Inspection policy, and Safety Manual
- Staff Exhibit 204: UEC's response to Staff DR 7, 9, & 10

Q. How is your testimony organized?

A. My testimony is organized as follows:

Q. Why are you focusing on these two topics in your testimony?

A. In relevant part, ORS 758.015(2) states:

> The commission, in addition to considering facts presented at such [a public] hearing, shall make the commission's own investigation to determine the necessity, safety, practicability, and justification in the public interest for the proposed transmission line and shall enter an order accordingly.

Staff Witness Geoffrey Ihle discusses the background of UEC's proposal as well as Staff's investigation into the necessity, practicability and conformance with land use guidelines of the proposed transmission line, while my testimony focuses on the remaining topics.

ISSUE 1, SAFETY

Q. How did Staff evaluate the safety of the proposed project?

A. Staff considered the Commission's discussion in Commission Order No. 11-366 of the term "safety." Specifically, the order states:

> "Safety" means "the condition of being safe, freedom from being exposed to danger; exemption from hurt, injury, or loss." To establish the safety of a project, petitioner must show that the project will be constructed, operated, and maintained in a manner that protects the public from danger.[1]

In its analysis, Staff utilized information provided in UEC's Petition for a Certificate of Public Convenience and Necessity (Petition), testimony in support of the Petition, data responses, general research and information provided by the Public Utility Commission's Safety Division. Staff identified two aspects to safety for the purposes of the analysis: UEC's general operation and maintenance and its proposed plans for the transmission line.

Q. Please provide Staff's analysis of UEC's general operation and maintenance.

A. UEC has been in operation since 1937.[2] It currently owns 130 miles of transmission lines.[3] Staff reviewed UEC's Electrical Facility Inspection policy, Line Inspection policy, and safety manual and found no issues or concerning items.[4]

---

[1] *In re Pacific Power and Light*, OPUC Docket No. UM 1495, Order No. 11-366 at 4 (Sept. 22, 2011).
[2] Umatilla Electric Cooperative Petition for Certificate of Public Convenience and Necessity (UEC Petition) at 1.
[3] See Exhibit Staff/202, Gibbens/1.
[4] Exhibit Staff/203, Gibbens/1-182.

Q. Please provide Staff's analysis of the safety of the proposed line.

A. The current proposed transmission line will equal roughly four percent of the total network of transmission lines owned by UEC.[5] The proposal and construction process will follow the guidelines set forth by the Rural Utility Service (RUS).[6] The easement requested by UEC is 25 percent larger than that required by NESC standards (50 feet vs 40 feet) along areas where there are limited buildings or structures and will not result in a large impact to landowners.[7] In those portions where a larger easement would have a direct impact on a building, UEC is requesting an easement of 25 feet; however, those portions will have a greater than required vertical clearance.[8] The added easement space will ensure a safe operating distance, and maximize the safety of area residents and maintenance workers, and will provide UEC with a clear, unobstructed path for the line.[9]

Q. Has UEC considered the safety of the environment in its petition?

A. Yes, UEC reviewed the United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation requirements.[10] None of the 17 avian species that may be present in Umatilla County are currently listed on Oregon Department of Fish and Wildlife's list of endangered species.[11] UEC will also include devices to prevent the electrocution of avian species.[12]

---

[5] See Exhibit Staff/202, Gibbens/1.
[6] UEC/201, Echenrode/15.
[7] See Exhibit Staff/202, Gibbens/2.
[8] *Ibid.*
[9] *Ibid.*
[10] Exhibit Staff/202, Gibbens/3.
[11] *Ibid.*
[12] *Ibid.*

Further, as noted in UEC's response to Staff DR 16, the proposed transmission line is almost exclusively along road right-of-ways with a large portion of the path containing structures which were originally designed for 69kv transmission which will further limit the total impact to the environment.[13]

Q. Did Staff consider Clarence & Geraldine Charlo's concern in their comment letter filed on September 19, 2016, that the proposed line may have a negative health impact due to the fact that the high voltage line goes over their house?

A. Yes. Staff reviewed the concerns posited by Mr. and Mrs. Charlo in their letter provided in the record. Staff could find no evidence that the proposed line would not conform to all applicable federal, state, and local safety standards. Staff asked UEC to respond specifically to the safety concern raised by the Charlos in a data request.[14] UEC stated that the line would not in fact go over their residence, but would instead be located next to their home.[15] The minimum clearance of the proposed line from the Charlo residence is roughly 58 percent above the minimum required by NESC standards.[16] UEC reviewed and verified the estimated exposure to EMFs in order to meet the requirements shown in Institute of Electrical and Electronics Engineers (IEEE) standard C95.6: Standard for Safety Levels

[13] *Ibid.*
[14] Exhibit Staff/202, Gibbens/4.
[15] *Ibid.*
[16] *See ibid.*

with Respect to Human Exposure to Electromagnetic Fields.[17] In UEC's review, the line is shown to be a minimum of 20 percent below the allowable EMF levels declared by the IEEE along the entirety of the proposed line.[18]

Q. Does Staff find the proposed line to be safe?

A. Yes, the proposed construction and line will adhere to relevant safety standards. UEC has limited the external risks and the landowners directly affected by proximity are unlikely to be harmed.

[17] *Ibid.*
[18] *Ibid.*

ISSUE 2, JUSTIFICATION

Q. How did Staff evaluate the justification for the proposed project?

A. Staff utilized the discussion of this standard set forth in Commission Order No. 11-366:

> "Justification" means "the act of or instance of justifying." "Justify," in turn, means "to prove or show to be valid, sound, or confirming to fact or reason." Thus, to show that a project is justified, the petitioner must show sufficient reason for the project to be built. To make this determination, we consider the public benefits and costs of the project. Where possible, we rely on benefits and costs that can be quantified in economic terms.[19]

In reviewing the justification for the proposed project, Staff attempted to identify if UEC had provided an acceptable reason for constructing the line. Starting with the assumption that the line is necessary, as Staff finds in its testimony on that issue,[20] Staff examined whether UEC had reasonably demonstrated that the selected route was the optimal solution. Staff then reviewed whether UEC made every attempt to limit the impact on individual landowners and comply with the public interest.

Q. Why did Staff not perform a traditional cost/benefit study?

A. A standard measure to identify justification is to perform a cost/benefit study. However, the majority of the benefits of the line are somewhat unquantifiable. Improvements to reliability, reductions in outages, flexibility in serving load and increased load serving capabilities are benefits which are difficult to assign a monetary value, making a cost/benefit study of limited value. The traditional accounting costs, which are easily quantified in dollar terms, are not a primary

[19] Order 11-366 at 4.
[20] *See* Staff/100, Ihle/10.

concern for Staff because UEC is not a rate-regulated investor-owned utility. As a consumer-owned cooperative, UEC is assumed to be acting on the behalf of all of its customers, and any costs that it incurs are the result of actions taken in some sense by the representatives of the customers themselves. UEC follows the "Democratic Member Control" principal, so customers have a direct impact on decision-making.[21] As a cooperative, the customers are also the stakeholders, and any profits the utility makes are either returned to them or re-invested in the cooperative.[22] So while Commission Staff did consider the total costs in its assessment of the practicability of the filing, the cost, though important, does not bear the same importance as it would if UEC were an investor-owned utility.

Q. Does Staff believe that this is the best alternative which UEC examined?

A. Yes. UEC examined two alternative routes as well as an option of upgrading existing lines to serve the same purpose as the proposed line. As discussed in Staff/100, the two alternatives have a higher customer impact, higher cost, and greater length. The longer the line, the more prone it is to line loss and weather or physical impacts which cause outages.

[21] UEC Cooperative Principles; https://www.umatillaelectric.com/about/uec-cooperative-principles/; 11/9/16.
[22] UEC History; https://www.umatillaelectric.com/about/history/; 11/9/16.

Table 1.

Alternative	Cost[23]	New Customer Impact[24]	Length[25]
Proposed Route	$5.74 Million	.1 Miles	4.71 Miles
West Alternate	$ 6.1 Million	2.9 Miles	4.78 Miles
East Alternate	$7 Million	4.8 Miles	6 Miles
Upgrade Existing Lines	>$11 Million	0 Miles	11.5 Miles

Table 1, above, shows the relative costs, new customer impact and lengths for each alternative. The primary route is also the only route of the three alternatives that follows the existing transmission path for the longest duration possible. It also has the advantage of being the lowest cost and most reliable option. Further, upgrading the existing lines would not provide the added benefit of an additional layer of redundancy to reduce outages to the area.[26] This provides a benefit to 11,133 Oregon ratepayers, 7,978 of whom are served by UEC directly.[27]

Q. Did Staff examine other alternatives beyond the three presented by UEC?

A. Yes, Staff looked for other possible options; however, given the relatively short distance between starting and ending points, along with the geography of the area surrounding the termination points, no other viable alternatives were identified.

[23] Exhibit Staff/204, Gibbens/1-3.
[24] *Ibid.*
[25] *Ibid.*
[26] Exhibit Staff/202, Gibbens/5.
[27] Exhibit Staff/202, Gibbens/6.

Q. Does Staff believe this is the best option to fulfill the needs of the UEC?

A. Yes. Because an upgrade to the existing system does not achieve the same benefit, and requires substantial amounts of additional capital, along with the fact that the chosen route is the best possible alternative to limit customer impact and minimize costs, Staff finds the proposed route to be justified.

Q. If the route is justified, has UEC performed due diligence in minimizing the impact to customers, businesses, and anyone affected by the proposal?

A. The use of condemnation to place utility structures and equipment should be used as a last resort. However, any condemnation proceeding that would follow as a result of the Commission's granting of UEC's Petition would follow legal standards on compensating landowners for the value of property interests taken due to the placement of the transmission line. In reviewing UEC's attempts to obtain all of the necessary easements, Staff finds that UEC has made a reasonable effort to come to an agreement with affected landowners. UEC began the process of obtaining easements for the line in January of 2015, with an initial round of contact with every affected landowner.[28] UEC placed stakes at the proposed location of the structures for any landowner who was interested as well as adjusted structure placement when possible to accommodate the wishes of the land owner.[29] Out of 71 easements that UEC would need to secure in order to construct the line, UEC has currently obtained

[28] Staff Exhibit/202, Gibbens/7.
[29] *Ibid.*

54.[30] So at this time, roughly three-fourths of all affected landowners have agreed to the easement compensation offered. UEC continues to be in contact with the remaining landowners.

Q. Does Staff find the proposal justifiable?

A. Yes. Given that the line is necessary, and that the proposed route is the best alternative, along with the fact that UEC has attempted to limit the impact to all customers, Staff finds the proposed transmission line justified and is in the public interest.

Q. Does this conclude your testimony?

A. Yes.

[30] Exhibit Staff/202, Gibbens/8.

CASE: PCN 1
WITNESS: SCOTT GIBBENS

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 201

Witness Qualifications Statement

November 10, 2016

Docket No. PCN 1

Staff/201
Gibbens /1

WITNESS QUALIFICATION STATEMENT

NAME: Scott Gibbens

EMPLOYER: Public Utility Commission Of Oregon

TITLE: Senior Economist
Energy Rates, Finance and Audit

ADDRESS: 201 High St. SE Ste. 100
Salem, OR 97301-3612

EDUCATION: Bachelor of Science, Economics, University of Oregon
Masters of Science, Economics, University of Oregon

EXPERIENCE: I have been employed at the Oregon Public Utility Commission (Commission) since August of 2015. My current responsibilities include analysis and technical support for electric power cost recovery proceedings with a focus in model evaluation. I also handle analysis and decision making of affiliated interest and property sale filings, rate spread and rate design, as well as operational auditing and evaluation. Prior to working for the OPUC I was the operations director at Bracket LLC. My responsibilities at Bracket included quarterly financial analysis, product pricing, cost study analysis, and production streamlining. Previous to working for Bracket, I was a manager for US Bank in San Francisco where my responsibilities included coaching and team leadership, branch sales and campaign oversight, and customer experience management.

CASE: PCN 1
WITNESS: SCOTT GIBBENS

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 202

Exhibits in Support of
Cross-Answering Testimony

November 10, 2016

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 14: Please provide an estimate of the number of miles of transmission line that UEC owns.

Response

Based on year end 2015 records, UEC owns 130 miles of transmission line. Adding the five-mile length of this line results in a new total of approximately 135 miles of transmission line ownership.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 30: Regarding Exhibit UEC/107, Toth/7-25, please explain in detail how the Company determined the minimum widths of the proposed easements. In the Company's response, please indicate whether and how the Company considered safety, accessibility, and the impact on affected landowners.

Response

Using horizontal clearance requirements from the 2017 Edition of the National Electrical Safety Code (NESC) and guidelines for recommended easement width described in Rural Utilities Service (RUS) Bulletin 1724E-200, the calculated minimum easement width for the proposed project was determined using blow-out distances of conductors and minimum required horizontal clearances to typical installations along the line to be approximately 40 feet. A total of 10 feet, 5 feet on each side, has been added to the minimum easement width to gain additional clearance above the minimum required values resulting in a total typical easement width of 50 feet.

In areas where the proposed project runs adjacent to a road, the structures will typically be placed 2-5 feet off of the road right-of-way. Because many of the properties along the road right-of-way have houses and buildings near the road, UEC is requesting an easement that is only 25 feet, which will limit the impact on landowners while providing the minimum required easement width by utilizing the right-of-way to maintain clearances from the line.

The horizontal clearances required by the NESC inform the required easement width and are intended to provide a safe operating distance between the line and typical installations found along power lines, such as buildings, signs, and chimneys. When horizontal clearance cannot be maintained, the NESC and RUS Bulletin 1724E-200 require vertical clearance be maintained to provide a safe operating distance between the line and buildings. In areas where there are buildings inside the easement on the proposed project, the line has been designed to maintain more than the minimum required vertical clearance over those buildings. Having the easements in place will allow for the maintenance of the line and ensure that the required safe operating clearances can be upheld by the cooperative. By removing the line from the road right-of-way onto power line easements, the membership will not be required to finance any future line modifications necessary to accommodate upgrades in the road right-of-way, thus gaining financial security.

Regarding accessibility, there are roads running along a majority of the proposed project which will provide access to the line and limit the impact on landowners.

Response Date: October 20, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 16: Please describe any biological assessments required to evaluate the potential environmental effects on listed and proposed species and critical habitat in the project area. If available, please describe the impacts on such species or habitats identified by applicable environmental assessments.

Response

UEC has reviewed US Fish and Wildlife ("USFW") Information for Planning and Conservation ("IPAC") requirements. Per USFW, there are 19 species that may be present in Umatilla County. These species are listed in the table below. The IPAC website does not list any critical habitats for those species in the UEC project area.

Species	Listing/Season
Fishes	
Bull Trout	Threatened
Mammals	
Gray Wolf	Endangered
Migratory Birds	
Bald Eagle	Year-round
Brewer's Sparrow	Breeding
Calliope Hummingbird	Breeding
Eared Grebe	Breeding
Ferruginous Hawk	Breeding
Flammulated Owl	Breeding
Fox Sparrow	Breeding
Loggerhead Shrike	Breeding
Long-billed Curlew	Breeding
Peregrine Falcon	Breeding
Rufous Hummingbird	Breeding
Sage Thrasher	Breeding
Short-eared Owl	Year-round
Swainson's Hawk	Breeding
Western Grebe	Breeding
White Headed Woodpecker	Year-round
Willow Flycatcher	Breeding

As of this date, none of the 17 migratory birds listed above appear on the list of "Oregon's Endangered Species" as listed by the Oregon Department of Fish and Wildlife (www.dfw.state.or.us).

Additionally, the area of UEC's proposed McNary-Hermiston Butte Line is almost exclusively along road right-of-ways and on already developed land between the cities of McNary and

Hermiston. Clearing of trees associated with construction will be minimal since easement areas are adjacent to road rights-of-way and on developed land between the cities of McNary and Hermiston.

The proposed infrastructure is similar to other electric facilities in the area and the existing line proposed to be upgraded to 115 kV already has structures that were originally designed for 69 kV transmission service.

For these reasons, UEC has concluded that the project will not have a negative impact on listed species, their habitats, or proposed or designated critical habitat.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 26: Clarence and Geraldine Charlo filed written comments in this proceeding noting that the proposed new easement would add almost ten additional feet running through their house. The Charlos comment, "The transmission lines will then be over a larger part of our house and we wonder about our safety." In regard to this comment:

a. Please provide the Company's response to the Charlos' comment;

b. If UEC agrees that the proposed line passes above the Charlos residence, please state whether the Company considered routing the proposed transmission line to avoid a route passing over the Charlos' residence. If so, please explain why the Company does not propose such a route.

Response

Contrary to the statement made in the Charlo letter, the power lines for the proposed project will **not** pass over the Charlo's house. The Charlo property is depicted on the aerial photograph in the pre-filed testimony of Louis S. Toth. See UEC/107, Toth/8. The easement UEC would like to obtain from the Charlos is only 25 feet in width, as shown by the yellow cross-hatched area on that figure. The easement is meant to limit future encroachments on the line in the area of the easement for safety. The proposed structures (poles) will be installed 2-5 feet inside the westernmost boundary of the easement. To prevent any overhang of the house, all conductors on this section of the line have been designed to be installed on the west side of those structures. The structures on this easement are designed so that the closest energized conductor will have a minimum of 19.8 feet of total clearance to the west corner of the house consisting of 7 feet of horizontal clearance and a minimum of 18.5 feet of vertical clearance.

The 2017 Edition of the National Electrical Safety Code (NESC) and Rural Utilities Service (RUS) Bulletin 1724E-200 have requirements for the amount of vertical clearance between a line and a building. The minimum vertical clearance required for safe operation by the NESC and RUS Bulletin 1724E-200 between the distribution line and a house is 12.5 feet. The minimum vertical clearance value used in the design of the proposed line, including for this property, is 18.5 feet, well in excess of NESC and RUS Bulletin 1724E-200 requirements. Having the easements in place will allow for the maintenance of the line and ensure that the required safe operating clearances can be maintained by the cooperative. By locating the poles outside the road right-of-way and within the power line easements, the membership will not be required to finance any future line modifications necessary to accommodate upgrades in the road right-of-way, thus gaining financial security.

Response Date: October 20, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 2: Please refer to UEC/100, Toth/9, line 11, which states that line upgrades would not provide the same long-term benefit as the proposed new line. Please explain further why upgrading existing lines would not have same long-term benefits.

Response

The proposed transmission line brings a new 115 kV line to the area from the major McNary switching station. The only line serving areas south of the McNary station is the existing line that runs between the McNary station and the Pond Gang Operated Air Brake Switch ("Pond GOAB") located one-quarter mile west of Interstate 82. This line branches in two directions; one traveling east to Hermiston and one traveling south to Westland. Loss of this existing line due to an outage condition will result in loss of the 115 kV source to eight substations served by the line, including the Hermiston Butte substation and areas to the south of the Pond GOAB. The proposed transmission line eliminates this outage contingency by providing a separate source of power to these areas. Upgrades to the existing line, for example by increasing the conductor size, would not provide the same benefits and an outage on the existing line after it is upgraded would continue to have far-reaching impacts to all substations served by that line. Additionally, because the proposed transmission line would result in the presence of two lines rather than one, voltage performance of the entire system is improved significantly beyond that of an upgraded single source line.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 34: Regarding UEC/104, Toth/1, please provide all available data on the geographic scope and number of customers affected by these outages.

Response

Please see the map included with this response as "Response 34 Attachment 1." Total customer count as shown on the map is 11,133 members including 3,155 served by Hermiston Electric Services.

Response Date: October 20, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 23: Regarding UEC/107, Toth/1-2, please provide a narrative description of all contact and attempts to obtain the outstanding easements which are highlighted.

Response

Mr. Mike Priest, working for Toth & Associates on behalf of UEC, has had multiple conversations with each landowner along the Primary Route to discuss securing an easement. During these conversations details of the easement have been discussed with the landowner. In some cases, when requested by the landowner, stakes have been placed to show the proposed location of the structures. When reasonable requests have been made, structure placement has been adjusted to accommodate the landowner's preference on structure locations. Based on the initial rounds of contacts, UEC was able to obtain easements on 53 properties. For those landowners who did not grant easements, Mr. Priest has made, and continues to make, additional contacts, some of which eventually resulted in UEC obtaining additional easements. For those properties on which easements must still be obtained, UEC is in different states of negotiation, but continues to stay in communication with those landowners.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Robert Echenrode

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 36: See UEC/107 Toth/1-2. In UEC's initial filing, 19 parcels were identified as requiring easements that UEC had not yet obtained. Please update Exhibit UEC 107 and any other relevant exhibits to reflect any additional required easements that have been obtained by the Company since UEC's initial filing on August 19, 2016. This is an ongoing request.

Response:

Exhibit UEC/107

As UEC noted in the narrative and pre-filed testimony of its petition, and as further explained in UEC's Response to PUC Staff DR 23, UEC has continued to analyze the need to obtain easements for the transmission line and to work with property owners for that purpose. Since that time, the following changes have occurred:

1 - UEC has determined that the easement designated "Easement CU-811.1" is no longer needed. The original purpose of that easement was to facilitate moving a power line from the west side of Lind Road to the east side in that area. UEC has decided to not modify the existing line on the west side of the road and it can use an existing connection further to the south rather than utilize this easement for that purpose. This easement has therefore been removed from the exhibits, with corresponding changes in the table that originally appeared at Exhibit UEC/107, Toth/1, removal of the easement from the overview map that originally appeared at Exhibit UEC/107, Toth/3, removal of the specific easement figure that originally appeared at Exhibit UEC/107, Toth/9, and removal of the easement from the list of property owner addresses that originally appeared at Exhibit UEC/107, Toth/27.

2 – UEC has obtained from the landowner the easement designated "Easement CU-821." Accordingly, that easement is no longer highlighted as it was in the original version at Exhibit UEC 107, Toth/1, the easement now appears blue rather than yellow as it did in the original version at Exhibit UEC 107/Toth 4, the specific easement figure that originally appeared at Exhibit UEC/107, Toth 14 has been removed, and the owner's name and mailing address have been removed from the list of property owner addresses that originally appeared at Exhibit UEC/107, Toth/27.

3 – UEC discovered an error in its original depiction of "Easement CU-847." Specifically, that easement is identified in the original exhibits at Exhibit UEC/107, Toth/20 and shows an easement that is twenty-five feet (25') in width. In reality, UEC wishes to obtain an easement that is fifty feet (50') in width across that property. An early design anticipated that the transmission line might be able to be located adjacent to the road right-of-way on the west side of that property. When the final design was developed, however, it utilized the same location as the existing power line on that property, which is set back from the road right-of-way. While the

new alignment changed as part of the final design presented in UEC's petition, the need for a wider easement – one that does not utilize the road right-of-way – was not captured. The appropriately-sized easement is now included, with corresponding changes that include an expansion of the easement in the overview map that originally appeared at Exhibit UEC/107, Toth/5, and modification of the specific easement figure that originally appeared at Exhibit UEC/107, Toth/20. The easement value shown in the table that appears at Exhibit UEC/107, Toth/1 already reflected a fifty foot (50') wide easement and therefore does not require revision.

Included with this response is "Attachment DR 36-1" which reflects each of the changes described above and which supplants the original Exhibit UEC/107 filed with UEC's petition.

Exhibit UEC/108

In addition to changes to various easements described above, UEC has continued to refine the specific components of the transmission line along the proposed route. Included with its petition and the pre-filed testimony of Louis S. Toth, UEC provided figures showing the profile of the line and the specific structure types that would be installed along the route. See Exhibit UEC/108. As UEC continues to work with property owners along the route and develop more precise engineering drawing for the line, the information in Exhibit UEC/108 has changed. In response to this data request, UEC is also providing "Attachment DR 36-2" which reflects those changes and which supplants the original Exhibit UEC/108 filed with UEC's petition.

Some of the changes are the result of the need to avoid or to safely cross over existing facilities such as high pressure water lines or irrigation canals. Other changes are the result of further refinements to ensure the line satisfies applicable engineering requirements and safety standards. Many of the changes simply conform the labels used to denote structure type to the standard labels used by Rural Utility Services or add detail to the label for constructability purposes. Below is a list of each change made to the exhibit. The drawings have been condensed from 11 pages to 10 pages by maximizing space used on each page. The overall project length and scope have not changed.

- Str 3: Structure has been shifted north 35' to prevent encroachment on Bureau of Reclamation right-of-way.
- Str 9: Pole height has been decreased from 105' to 100' to accommodate the addition of structure 10.1 near the 69 kV line crossing at Power City Road.
- Str 9: Unit CS6.72F has been renamed to CS6.72F (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 10: Pole height has been decreased from 115' to 105' to accommodate the addition of structure 10.1.
- Str 10.1: This structure has been added to shorten the span and reduce the sag of the proposed line at the 69 kV line crossing near Power City Road.
- Str 11: Pole height has been decreased from 115' to 105' to accommodate the addition of structure 10.1.
- Str 11: Structure has been shifted south 16' to prevent encroachment on Bureau of Reclamation right-of-way.

- Str 11: Unit AS5.21A has been renamed to AS5.21A (#4 Copper) to describe the type of existing distribution wire attached to the unit.
- Str 12: Pole height has been decreased from 105' to 100' to accommodate the addition of structure 10.1.
- Str 12: TM-4G(OPGW) units have been removed. These were additional attachment units used for the static wire. They are no longer needed with the addition of structure 10.1.
- Str 14: Structure class has been increased from H5 to H6 for additional pole strength.
- Str 15: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 18: Structure class has been increased from H5 to H6 for additional pole strength.
- Str 20: Unit TH-15E has been changed to TH-5AB to correspond with typical RUS drawing designations.
- Str 21: Unit TH-15DA has been changed to TH-5AD to correspond with typical RUS drawing designations.
- Str 22: Unit TH-15F has been changed to TH-5AC to correspond with typical RUS drawing designations.
- Str 25: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 27: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 27: Unit A6.21 has been renamed to A6.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 30: Unit A5.21 has been renamed to A5.21 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 34: Stub pole class has been decreased from 1 to 3 for optimization.
- Str 35: Structure has been modified to be self-supporting. The pole material has been changed from wood to steel and the stub pole (unit 30-1) and guy wires have been removed. All other units have been adjusted to their steel counterparts. These changes were made to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 36: Unit CS1.41P-A has been adjusted to CS1.41P to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 37: Unit CS1.41P-A has been adjusted to CS1.41P to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 38: Structure has been shifted 81' south to avoid interference with a high pressure water line.
- Str 39: Structure has been modified to be self-supporting. The pole material has been changed from wood to steel and guy wires have been removed. All other units have been adjusted to their steel counterparts. These changes were made to avoid schedule delays caused by encroaching on Bureau of Land Management property.
- Str 40: Structure has been shifted 8' north to increase clearance on span between 39 and 40.
- Str 46: TM-4G(OPGW) units have been removed. These were additional attachment units needed for the static wire to facilitate splicing the static. The splice has been moved and these units are no longer needed on this structure.
- Str 49: Unit C1.41P has been replaced with S2.32A. This modification adds distribution switches to the pole.
- Str 55: Stub pole class has been increased from 3 to 2 for additional pole strength.
- Str 55: Unit C6.72F has been renamed to C6.72F (123 AAAC) to describe the type of existing distribution wire attached to the unit.

- Str 60: One of the C1.41P units has been renamed to C1.41P (1/0 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 69: Unit A5.21 has been renamed to A5.21 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 70: Unit A5.21 has been renamed to A5.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 71: Structure class has been increased from H4 to H5 for additional pole strength.
- Str 72: Unit A5.21 has been renamed to A5.21 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 76: Distribution circuit coming into structure from north has been moved up to attach to top circuit running south.
- Str 77: Unit C5.72 has been renamed to C5.72 (123 AAAC) to describe the type of existing distribution wire attached to the unit.
- Str 80: Unit C5.72 has been renamed to C5.72 (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 82: Unit CS5.72 has been renamed to CS5.72B (#4 ACSR) to describe the type of existing distribution wire attached to the unit and adjust the tap line configuration.
- Str 85: Unit CS5.72A has been renamed to CS5.72A (#4 ACSR) to describe the type of existing distribution wire attached to the unit.
- Str 90: Structure has been shifted north 26' to prevent encroachment on Bureau of Reclamation right-of-way.
- Str 95: A communication line that ends on structure 94 now ends on structure 95.

Response Date: November 4, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

CASE: PCN 1
WITNESS: SCOTT GIBBENS

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 203

Exhibits in Support of
Cross-Answering Testimony

November 10, 2016

Please sign, date and return this page to
the Umatilla Electric Compliance Administrator

I acknowledge that I have received a printed copy of the Umatilla Electric Cooperative Safety Manual. I understand it is my responsibility to know the general contents and specifically to know, understand and utilize the portions applicable to my work.

_____
(signature)

_____
(date)

UEC UMATILLA ELECTRIC COOPERATIVE
A Touchstone Energy® Cooperative

Safety Manual
Revised: June 2016

Please sign and date the reverse side and return this page
to the Umatilla Electric Compliance Administrator

PCN 1 - Staff/203
Gibbens/3

UEC UMATILLA ELECTRIC COOPERATIVE

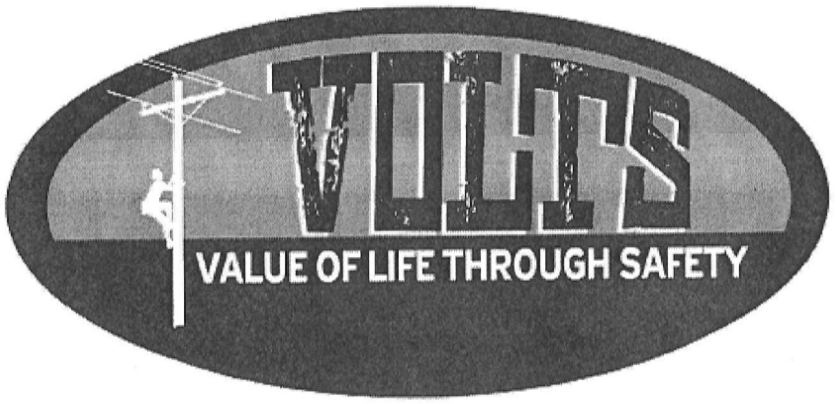
A Touchstone Energy® Cooperative

SAFETY MANUAL

Revised: June 2016

Safety Manual Committee Members

Tim Mills	Lineman Agent
Ryan Corey	Line Foreman
Steve Ferraro	Operations Manager
Geri Dickmeier	Compliance Administrator
Jim Putman	Line Superintendent



FORWARD

The safety manual is presented to each employee so that the information contained in the manual can help provide, create, and maintain a safe and healthful work environment for all employees. Umatilla Electric Cooperative (UEC) is committed to the safety and welfare of each and every one of its employees. In recognition of this fact, UEC will provide equipment, specifications and working conditions that promote safety.

The provisions contained within this safety manual cite applicable rules and work procedures of the Occupational Safety and Health Administration (OSHA) as defined within OSHA 29 CFR 1910 and the safety regulations of the State of Oregon.

This safety manual is intended to supplement and interpret federal and state standards as they apply to our work environment. This reprinted edition supersedes all previous editions and revisions. Compliance with this safety manual will provide safe working procedures and conformance with pertinent laws and codes; however, the most stringent OSHA or state regulations will govern in all cases. The rules and work practices herein express minimum requirements for dealing with the principal hazards inherent in our daily work activities.

These and other written requirements, which neither can, nor should, provide complete coverage of all work situations, must be continually reinforced through the sound and mature safety judgments of each employee on each assigned task.

Although the safety manual has been presented in convenient sections such as overhead, underground, substations, etc., the sections are not intended to be stand-alone portions of safety rules. A worker must apply appropriate rules from all sections that are applicable to the task being performed. Employees are warned not to assume that their sole safety responsibilities are wholly contained in one section just because that section sounds appropriate by title.

This manual has been developed as a collaborative effort of employees. It is your manual; you are responsible for knowing its general contents and specifically knowing, understanding, and utilizing the portions applicable to your work. Only by understanding the hazards and the controls required to keep them in check, can you hope to achieve a career free of accidents. Please study these rules and make sure you apply them in your daily activities. If we all live by these rules and make a conscious effort to think about the hazards we may be exposed to in the job at hand, and how to control those hazards, we can all reap the benefits of an injury-free workplace.

Table of Contents

SECTION 1 RESPONSIBILITIES

SECTION 2 GENERAL RULES

SECTION 3 PERSONAL PROTECTIVE EQUIPMENT

SECTION 4 HEALTH AND ENVIRONMENTAL CONTROL

SECTION 5 VEHICLE OPERATIONS

SECTION 6 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

SECTION 7 GROUNDING FOR EMPLOYEE PROTECTION

SECTION 8 DISTRIBUTION AND TRANSMISSION

SECTION 9 TREE TRIMMING

SECTION 10 UNDERGROUND LINES AND EQUIPMENT

SECTION 11 OFFICE SAFETY

SECTION 12 FIRST AID

SECTION 13 TRAINING

SECTION 1 RESPONSIBILITIES

101 Employer Responsibilities

1. The employer shall provide and maintain the necessary protective devices specified in these rules and require the employees to use them properly.

2. The employer shall develop and maintain a hazard communication program as required by Fed/Oregon OSHA part C which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

3. There shall be installed and maintained in every fixed establishment employing two or more persons a safety bulletin board of a size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material.

4. The employer shall require all employees to observe these safety rules. The lead worker to observe and enforce all safety rules and shall furnish a copy of these safety rules to each employee who is covered by these rules.

5. The employer shall appoint only competent workers to supervise their employees and those appointed shall be responsible for the safety of the employees under their supervision.

6. The employer shall certify that each employee has received the training required by Fed/Oregon OSHA 1910.269. Records of this certification shall be made when the employee demonstrates proficiency in the work practices involved and shall be maintained for the duration of the employee's employment.

7. Employer shall provide safety training for each employee. New employees shall be promptly trained in safety related procedures.

8. Safety meetings/trainings shall be held regularly and documentation of meetings shall be maintained.

102 Foreman's Supervisory Responsibilities

1. Foremen are at all times responsible for the observance and enforcement of safety rules and all accidents to workers under their direction.

2. Foremen are responsible for tools and equipment used by workers under their direction and shall make inspections of tools of workers under their direction and inspect, or designate someone to inspect, the condition of equipment under their supervision.

3. Foremen shall arrange work so it is performed with minimal hazard and shall be responsible for the assignment of workers to the parts of the job to be completed. Foremen shall hold a tailboard briefing to outline the job to be performed.

4. Foremen shall be responsible for the proper use of safety devices and equipment necessary to safeguard the workers or the general public.

5. Foremen shall be responsible for the conduct of their crew and shall not permit horseplay on the job.

103 Individual Responsibilities

1. Each employee has the duty to comply with all safety and health standards, all rules, regulations and orders issued pursuant to the Oregon & Federal OSHA, which are applicable to his/her own actions and conduct. Each employee shall keep in mind the safety of others.

2. Each employee has the responsibility to report recognized hazards and when hazards are reported by employees, lead-workers and others having authority shall accept the report in a cooperative manner and in no case shall an employee be reprimanded or penalized for reporting a hazard or potential hazard.

3. Horseplay and other distracting actions are not allowed while on the job.

104 Reporting Employee Injuries

1. Injuries, no matter how slight, shall be properly treated and reported to the person in charge and the employee's supervisor as soon as practical. When medical services are necessary, such treatment shall be reported to management immediately. Any actual or suspected electrical injury shall receive immediate medical care. An injury report shall be completed not more than 24 hours after the injury.

2. In case of serious or fatal accidents to employees, appropriate action shall be taken promptly. The accident shall be reported immediately to the department manager or next highest level manager at Headquarters.

3. Near miss or incident reports should be encouraged so they may be investigated and pertinent information shared with others so that accidents can be prevented.

105 Reporting Vehicle Accidents

The driver shall immediately and accurately report every accident involving a vehicle in his possession used for the business purposes of the Utility. Additional reports shall be made to the police or State authority as required.

106 Reporting Unsafe Conditions

When an unsafe condition that may cause injury, property damage or interfere with services is found to exist, regardless of the department in which the condition exists, the employee shall report it promptly to the proper authority.

SECTION 2 GENERAL RULES

201 Job Briefing

1. The employer shall require that the employee in charge conduct a job briefing for all employees involved before the start of each job. It shall be the responsibility of each crew member to actively participate in the tailboard briefing. This briefing shall cover at least the hazards associated with the job, the work procedures involved, special precautions, unusual conditions, energy source controls, and personal protective equipment requirements.

2. If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job each day or shift. Additional job briefings shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

3. A brief discussion is satisfactory if the work involved is routine and if the employee, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more extensive discussion shall be conducted:

    a. If the work is complicated or particularly hazardous, or if the employee cannot be expected to recognize and avoid the hazards involved in the job.

    b. An employee working alone need not conduct a job briefing. However, the employer shall require that the tasks to be performed are planned as if a briefing were required.

202 Inclement Weather

1. No work should be performed in inclement weather on high voltage lines or equipment when conditions are such as to materially increase the hazards of the operation being performed, except in emergency work necessary to restore service.

2. Thunderstorms in the immediate vicinity, high winds (excess of 45 mph), snow storms, and ice storms are examples of adverse weather conditions that are presumed to make this work too hazardous to perform, except under emergency conditions. This would include working from a bucket truck.

203 Warning Signs

1. Appropriate warning signs and markings as required by OSHA and NESC regulations shall be prominently displayed. Signs shall meet the design criteria in ANSI.

2. Warning signs shall be heeded. Persons seen in a dangerous situation shall be warned without being startled. Employees not required to be near potentially dangerous places shall keep away from them.

3. When doing work on public or private property, precautions must be taken to warn and protect the public. Hazardous areas, such as trenches, holes, or overhead work must be protected by adequate guards, signs, flags, barricades, or lights.

204 Housekeeping

1. Work locations, both inside and outside of vehicles and buildings, shall be kept clean and orderly at all times.

2. Workplace floors and platforms shall be kept free of dangerous projections or obstructions and shall be maintained reasonably free from oil, grease, or water. Where the type of operation produces slippery conditions, mats, grates, cleats, or other methods shall be used to reduce the hazard from slipping.

3. Stairways, aisles, permanent roadways, walkways, and material storage areas in yards shall be kept reasonably clear and free from obstructions, depressions, and debris.

4. Materials and supplies shall be stored in an orderly manner to prevent their falling or spreading and to eliminate tripping and stumbling hazards.

5. Paper and other combustible materials shall not be allowed to accumulate except in areas and containers provided therefore.

6. Weeds and other range vegetation shall not be permitted to grow in or around substations, pole yards, or buildings.

7. Materials and supplies shall be stored in an orderly manner to prevent their falling or spreading and to eliminate tripping and stumbling hazards.

8. Hanging or suspended storage shall be inspected for stability and security.

9. Loose material shall not be stored in areas where drivers and passengers ride. Materials shall not be allowed to accumulate in areas of the trucks and equipment except in the transporting materials to and from job sites.

10. Gasoline and other flammable materials shall be stored in appropriate cabinets designed for that use.

205 Smoking

Smoking is strictly prohibited on all UEC property. Smoking or open flames shall not be permitted in areas such as oil rooms, hydrogen or acetylene, or similar areas where dangerous gasses may be present. Neither shall smoking be permitted in storerooms, battery rooms, flammable liquid storage and use locations, or other areas where quantities of combustible materials are kept. The absence of a "no smoking" sign shall not excuse smoking in dangerous places.

206 Hand Tools

1. All tools shall be maintained in good condition. Employees shall always use the proper tool for the job performed. Tools shall be inspected before each use. Defective tools shall be removed from the job site or shall be tagged to prevent their use.

2. The insulation on hand tools shall not be depended upon to protect users from shock while working.

3. Measuring tapes or ropes which contain conductive strands shall not be used when working on or near energized parts.

4. The employer has the authority and responsibility to

condemn unserviceable tools, including tools which may be furnished by employees.

207 Portable Electric Tools

Portable power tools such as electric, pneumatic, hydraulic, and explosive actuated shall be maintained in good condition, inspected to determine if it is safe and clean, and serviced regularly as the manufacturer guideline recommendation. Power tools shall be examined before each and every use and only used as manufacturer recommends.

All portable electric hand tools except battery operated shall:

1. Be equipped with three-wire cord having the ground wire permanently connected to the metal part of a tool frame and means for grounding the other end; or

2. Be of the double insulated type and permanently labeled as "Double Insulated".

When using power tools approved for use on erected poles, tower, or structures, the tools and all electric supply lines connected thereto shall be kept in a safe distance under the level of circuits or apparatus energized in excess of 600 volts or shall be adequately guarded or secured in such a manner as to prevent their contacting energized conductors. Only approved portable power saws shall be used from elevated positions on erected poles. It is permissible to use gasoline driven chain saws from aerial lifts or on overhead work where workers are supported by safety straps when necessary; however, caution should be used.

Worn or frayed electric extension cords shall not be used.

Vehicle-mounted generators shall be adequately grounded or bonded to the truck they are mounted on per OSHA regulations.

208 Pneumatic Tools

1. Compressed air and compressed air tools shall be used with caution.

2. Pneumatic tools shall never be pointed at another person.

3. Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

4. Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

5. Compressed air shall not be used for cleaning purposes except when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

6. The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

7. The use of hoses for hoisting or lowering tools shall not be permitted.

8. All hoses exceeding one-half inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disengagement of a connection.

9. Pressure shall be released before connections are broken, unless quick acting, self-closing, connectors are used. Hoses may not be kinked.

10. A pneumatic tool used where it may contact exposed live electrical parts shall have a nonconductive hose and an accumulator to collect moisture.

209 Hydraulic Tools

1. Manufacturer's safe operating pressures for hydraulic tools, hoses, valves, pipes, filters, and fittings shall not be exceeded.

2. Pressure shall be released before connections are broken unless quick-acting, self-acting, self-closing connectors are used.

3. Employees shall not use any parts of their bodies to locate and attempt to stop a hydraulic leak.

4. A hydraulic tool used where it may contact exposed live electric parts shall have a non-conductive hose and use non-conductive oils. Care should be taken not to cross contaminate oils when using hydraulic tools for this purpose. Those hoses used for hot work shall be kept clean and shall be removed from service if suspect.

5. All hydraulic lines elevated 35 feet or more should have check valves or provide for loss of insulating value due to partial vacuum when used where they may come into contact with exposed live parts.

210 Explosive - Actuated Tools

1. Tools shall be maintained in good condition; inspected to determine if it is clean, if moving parts operate freely, and if the barrel is free from obstruction; and serviced regularly by qualified persons. The material upon which these tools are to be used shall be examined before work is started for the purpose of determining its suitability and eliminating the possibility of hazard to the operator and others.

2. Explosive-actuated tools shall not be used in an explosive or flammable atmosphere.

3. Tools shall not be loaded until just prior to the intended firing.

4. Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.

5. Tools and cartridges shall never be left unattended where they could be available to unauthorized persons.

6. Tools shall never be pointed at any person.

7. In case of a misfire, the operator shall hold the tool in place for 30 seconds. The employee shall then try to operate the tool a second time and then wait another 30 seconds. Misfired cartridges shall be properly disposed of.

8. Only powder charges, studs, or fasteners specified by the manufacturer for the specific tool shall be used.

211 Guards or Shields

1. No guard or shield shall be removed from any machine or piece of equipment except to perform required maintenance.

2. Guards or shields removed to perform maintenance operations shall be replaced immediately, and the machine shall not be operated while the guards are removed, except for maintenance certification.

212 Explosives

No employee shall use, blast or dispose of explosives and/or blasting agents unless in possession of a valid user's license, as issued by the State of Oregon. All local, State, and federal laws covering the transportation and use of explosives shall be observed.

213 Ladders

1. Wooden ladders shall not be painted so as to obscure a defect in the wood; only a clear, non-conductive finish shall be used.

2. All ladders shall be inspected before each use and at least annually. Ladders with weakened, broken or missing steps, broken side rails, or other defects shall not be used.

3. The use of ladders shall be limited to their manufacture rated strength. Load limits shall be marked on the ladder. Ladders shall not be used horizontally as platform runways or scaffolds or for any purpose other than that for which they were designed.

4. Portable metal ladders shall not be used in the vicinity of energized electrical circuits. (Exception: Such ladders may be used in specialized work, such as high voltage substations, where non-conductive ladders might present a greater hazard. These ladders shall be properly marked.)

5. Ladders shall not be placed in front of doors opening toward the ladder unless the door is open, locked, or guarded.

6. When ascending or descending ladders, employees shall face the ladder.

7. Only one employee shall work from a ladder at one time (except from hook-type ladders). If two employees are required, a second ladder shall be used.

8. Portable straight ladders shall not be used without nonskid bases.

9. The ladder shall be placed so that the distance between the bottom of the ladder and the supporting point is approximately one-fourth of the ladder length between supports.

10. Straight ladders shall not be climbed beyond the third step from the top.

11. When working from a portable straight ladder, the ladder must be securely placed, held, tied, or otherwise made secure to prevent slipping or falling.

12. When dismounting from a ladder at an elevated position (such as a roof) the employee shall ensure that the ladder side rails extend at least 3 feet above the dismount position, or that grab bars are present.

13. A ladder shall not be placed against an unsafe support.

14. The top step of a stepladder shall not be used, except for platform ladders.

15. Ladders shall be maintained free of oil, grease, and other slipping hazards.

214 Material Handling and Storage

1. Use of Mechanical Equipment. Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways, and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstructions across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked. Keep out from under suspended loads.

2. Secure Storage. Storage of materials shall not create a hazard. Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.

3. Housekeeping. Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.

4. In areas not restricted to qualified employees only, materials or equipment may not be stored closer to energized lines or exposed energized parts of equipment than the following distances plus an amount providing for the maximum sag and side swing of all conductors, and providing for the height and movement of material handling equipment:

    a. For lines and equipment energized at 50 kV or less, the distance is 10 feet (305 cm).

    b. For lines and equipment energized at more than 50 kV, the distance is 10 feet (305 cm) plus 4 inches (10 cm) for every 10 kV over 50 kV.

5. In areas restricted to qualified employees, material may not be stored within the working space about energized lines or equipment.

6. All tools and materials shall be stored in a safe and orderly manner in yards and warehouses.

7. Use gloves or hand pads as required when handling materials.

8. At least 2 persons shall be engaged in the loading and unloading of poles and other material when using a boom truck.

9. Employees shall not work under any load suspended by a crane, or similar equipment unless the load is adequately supported.

10. When necessary to control loads being handled by hoisting equipment, a tag line shall be used if employee

hazards exist.

215 Compressed Gases and Welding

1. When transporting, moving and storing compressed fuel gas and oxygen cylinders, the valve protection caps shall be in place and the cylinders must be in a secured, upright position except when carrying them. (Reference 29 CFR 1910.253 (b)(3)(ii)).

2. Check valves shall be properly installed on regulators and/or hoses.

3. Oil and grease must not be allowed to come in contact with valves or regulators of oxygen cylinders.

4. All cylinder valves shall be closed when not in use.

5. Welding and cutting shall be performed by qualified persons. Before welding or cutting is started, the area shall be inspected for fire hazards.

6. When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.

7. Properly rated fire extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.

8. A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area one half hour after completion of welding.

9. To protect eyes, face and body during welding and cutting, the operator shall wear an approved helmet or goggles, proper protective gloves, and clothing. Safety glasses or goggles shall be worn under the welding helmet if necessary to guard against flying particles. Helpers or attendants shall wear proper eye protection. Other employees shall not observe welding operations unless they use approved eye protection.

10. Machinery, tanks equipment shafts, or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated prior to the

application of heat.

11. In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated.

12. Where the work permits, the welder should be enclosed in an individual booth or shall be enclosed with noncombustible screens. The welder is responsible to warn workers or other persons, adjacent to the welding area. They must be protected from rays by shields or shall be required to wear appropriate eye and face protection.

13. Potentially hazardous materials in fluxes, coatings, coverings, and filler metals are released to the atmosphere during welding or cutting operations. While welding or cutting, adequate ventilation or approved respiratory protection shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium, and lead.

216 Batteries, Caustics, and Acids

1. When handling acid for batteries, employees shall wear face shields and protective clothing such as rubber gloves and aprons. Immediately flush any acid coming into contact with your skin. Avoid breathing acid vapors. Eyewash stations shall be installed and maintained in all locations where batteries are maintained.

2. Battery racks shall be stable and if metal, grounded. Use only approved battery handling straps while manually lifting and carrying batteries.

3. Proper identification and warning signs shall be posted at all entrances to battery rooms or compartments.

4. Suitable ventilation or other equally effective means shall be provided to make certain that toxic or flammable gases are not present in hazardous quantities.

5. Employees shall avoid smoking, using open flames, or using tools that may produce sparks in the vicinity of liquid-cell batteries. (Reference: National Electric Safety Code, Section 14).

SECTION 3 PERSONAL PROTECTIVE EQUIPMENT

All defective PPE shall be immediately removed from service and replaced.

301 Clothing

1. All employees, contractors, and visitors shall wear clothing and shoes that are suitable for the particular type of work and/or environment for which they are exposed.

2. Each employee exposed to hazards from electric arcs shall wear protective clothing and other protective equipment with an arc rating greater than or equal to the estimated heat energy.

3. When climbing wood structures or working near or on exposed live parts, FR long sleeve shirts with sleeves rolled down shall be worn.

4. Clothing made from acetate, nylon, polyester, polypropylene, or rayon, either alone or in blends, is prohibited, unless the employer can demonstrate that the fabric has been treated to withstand the conditions that may be encountered or that the clothing is worn in such a manner as to eliminate the hazard involved.

5. When work is performed in the vicinity of exposed energized parts of equipment, employees shall remove all exposed conductive articles, such as keys or watch chains, rings, or wrist watches or bands, if such articles increase the hazard associated with inadvertent contact with the energized parts or general duties performed.

6. Each employee shall wear gloves suitable for the work when hands are exposed to hazards such as those from skin absorption of harmful substances; cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes. Hand protection shall be inspected daily. It is recommended that rubber glove protectors not be worn as work gloves.

7. FR clothing will be worn in energized substations when exposed to arc-flash zone.

302 Eye and Face Protection

Appropriate eye and face protection shall be used by all UEC employees, contractors, and visiting persons when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. Eye protection must meet OSHA and ANSI Z87.1 standards. Such devices shall be inspected daily and immediately removed from service and replaced if found to be defective. Eye and face protective devices should fit properly and be kept clean at all times.

303 Fall Protection

1. Structures and Poles

    a. Fall arrest equipment, work positioning equipment, or travel restricting equipment, shall be used by employees working at elevated locations more than four feet above the ground on poles, towers, or elevated structures if other fall protection has not been provided. Qualified employees climbing or changing location on poles, towers, or similar structures must use fall protection equipment unless the employer can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.

    b. Work positioning systems shall be rigged so that an employee can free fall no more than two (2) feet.

    c. When stopping a fall, the personal fall arrest system shall limit maximum force on an employee to 900 pounds when used with a body harness.

2. Aerial Devices

    a. Harnesses with a lanyard attached to the bucket or the boom must be worn at all times. Harnesses shall be inspected daily prior to use.

b. No employee may free fall more than six feet or contact any structure underneath him.

c. When stopping a fall, the personal fall arrest system shall limit maximum force on an employee to 1800 pounds when used with a body harness. It shall bring an employee to a complete stop and limit maximum deceleration distance to 3.5 feet.

3. Belts and Safety Straps

a. Work positioning belts, safety straps, lanyards, lifelines, and body harnesses shall be inspected before use each day to determine that the equipment is in safe working condition. Defective equipment may not be used. The individual worker shall be responsible for maintaining his/her climbing equipment in good condition at all times. All, lanyards, safety straps, belts, harnesses and lifelines shall be periodically inspected by the supervisor in charge. Defective climbing equipment shall immediately be removed from service and replaced.

b. Body belts and safety straps shall not be stored with sharp or edged tools. Climbers shall be stored with gaff guards in place. Gaffs of less than one and one-fourth inches shall not be used.

c. When working from a hook ladder, workers must either belt themselves securely to the ladder, attach themselves to the structure by means of a safety line, or belt themselves to the ladder safety equipment, which shall consist of a safety rope or belting, threaded through the rungs or secured to the ladder at intervals not to exceed three feet.

d. Safety straps shall not be placed around poles above the top crossarm except where adequate protection is taken to prevent it from slipping over the top of the pole. Neither end of the strap shall be allowed to

hang loose, either in climbing or descending poles or other structures.

e. Snap hooks may not be connected to loops made in webbing-type lanyards.

f. Body belts shall be free from additional metal hooks and tool loops other than those permitted.

g. Employees shall look to make sure that the snap hook and "D" rings are properly engaged before the weight of the body is placed on the strap. When a safety strap is in use, both snap hooks shall not be attached to the same "D" ring.

h. Employees shall be secured by safety belts and lifelines when they work. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding. The rope shall have a nominal breaking strength of 5,400 pounds.

i. Body belts, straps, and climbers shall meet the applicable OSHA/ANSI standards.

j. For additional information on fall-arrest equipment and positioning device requirements, refer to OSHA standards 29 CFR 1910.67, 29 CFR 1910.269 (g) (2), 29 CFR 1910.269 App F, 29 CFR 1910.500-503, 29 CFR 1926.959.

304 Head Protection

1. Employees, contractors, and visitors working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be protected by protective helmets.

2. Hard hats for the protection of employees against

impact and penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1969; Safety Requirements for Industrial Head Protection.

3. Hard hats for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in 1910.135(b).

305 Footwear

1. Employees, contractors, and visitors shall wear protective footwear when working in areas of danger of foot injuries due to falling or rolling objects, or objects piercing the sole.

2. Protective footwear shall comply with ANSI Z41.91 standards.

306 Hearing Protection

1. The employer shall administer a continuing, effective hearing conservation program, as described by Oregon OSHA

2. Ear protection must be worn by employees when there is a possibility of hearing damage, which can occur during continuous exposure to noise or impulse exposure to loud impact noise. When exposed to noise of 85 decibels (db) for more than 8 hours, 95 db for more than 4 hours, 100 db for more than 2 hours, or 105 db for more than 1 hour, proper ear protection must be worn. Protection must be worn when exposed to impact noise more than 140 db, e.g. noise similar to rifle or shotgun.

3. Specific work area or equipment operation, which generates noise levels exceeding 85 dB, shall be identified.

4. Proper ear protection may consist of any of the following: earmuffs, ear plugs, molded ear protectors, or wax-type earplugs. Ear protective devices shall be worn properly to provide the required protection and kept clean to reduce the possibility of ear infection. Hearing protection devices shall be inspected daily or prior to use and shall be immediately removed and replaced if

found to be defective.

5. Employees within weighted average exposure shall be provided an annual audiometric test.

307 Life Jackets

When working where there is a danger of drowning, employees shall wear a Coast Guard approved personal floatation device or be protected by a safety harness and lanyard or by a safety net.

308 Respirators and Protection from Dusts, Fumes, Vapors

1. When working in dusty conditions, dust masks shall be provided to, and worn by, employees.

2. Approved respirators shall be used for the following:

    a. Entering or working in any confined or enclosed space or in any environment where air contaminants, dusts, mists, vapors, or gases are present in hazardous quantities.

    b. Exposure to any environment condition that would be unhealthy.

3. Respirators shall not be used unless employee has been trained in its use, and it has been determined that the employee is physically able to perform the work and use the equipment.

309 Use and Care of Rubber Protective Equipment

1. No protective equipment or material other than rubber shall be used, provided that such other non-conductive equipment may be used if it provides equal or better (dielectric) electrical and mechanical protection

2. than rubber protective equipment: provided, that the employer obtain before placing in service, manufacturer's data or other data to demonstrate that such non-rubber protective equipment provided equal or better electrical and mechanical protection than approved rubber equipment.

3. Protective equipment shall be rated for system voltage to be worked and shall not be used at voltages in excess of that for which the manufacturer has supplied data to the employer demonstrating that it is fit for such voltages.

4. No protective equipment shall be modified, altered, or used for purposes other than those for which it is designed unless and until the manufacturer has, in writing, agreed or suggested that there be such modification, alteration, or use.

5. Each rubber glove before it is used shall be inspected for defects and an approved air test performed. If, upon inspection, rubber gloves are either defective or appear to be defective; they shall not be used.

6. Before being placed in service, all rubber protective equipment shall be numbered and records kept for test purposes and assignment.

7. Rubber Blankets, line hose, and hoods shall be electrically tested at least once each 12 months after they are checked out for use, and complete records kept of all such tests and date of issue. Rubber protective not checked out for use within one year shall be re-tested before being issued.

8. Rubber gloves and sleeves shall be electrically tested at least once every 60 days after they are checked out for use. Complete records shall be kept of all such tests and date of issue. Rubber gloves and sleeves not checked out for use within 6 months shall be retested before being issued.

9. Protector gloves must be worn over insulating gloves. Exception: Protector gloves need not be used with Class 0 gloves, under limited-use conditions, where small equipment and parts manipulation necessitate unusually high finger dexterity.

   NOTE: Extra care is needed in the visual examination of the glove and in the avoidance of handling sharp objects.

10. Rubber gloves when not in use shall be properly stored in an approved bag, designed for that purpose. It shall be provided by the employer and made available to the employees.

11. Approved rubber gloves and carrying bag shall be assigned to each employee who works with, or is exposed to, energized parts.

12. Workers shall have rubber gloves on before reaching a position where they can touch high voltage conductors or equipment that are not protected, and they shall not remove their rubber gloves until entirely clear and out of reach of all such high voltage conductors or equipment.

13. Rubber protective equipment shall not be vulcanized or patched.

14. A compartment or box shall be provided on each electric line truck, which box or compartment shall be used for storing rubber protective equipment. No equipment shall be stored in said compartment or box, which can or could cause damage to the rubber equipment or goods placed in the compartment box. Additionally, a separate container or compartment shall be provided for rubber blankets.

15. Line hose shall not be doubled on themselves at any time. All blankets before storage must be wiped clean and rolled, not folded, before being placed in the container or box.

16. Protective line equipment of material other than rubber shall be kept clean and visually inspected before each use.

17. If protective line equipment or material other than rubber is found to be substantially defective or unsuitable for the purpose for which it is designed and intended, said protective line equipment shall not be used for personal protection of employees.

SECTION 4 HEALTH AND ENVIRONMENTAL CONTROL

This section deals with general health areas and depicts some of the control methods employees must use for their protection. The general principles outlined in this section are applicable to all work activities. However, specific control measures applicable to a specific work activity are covered in the section dealing with that work activity.

Work processes and work locations can present health hazards to the employee. Although many of these health hazards do not pose an immediate danger, they should still be given the attention that is necessary.

In order for employees to be fully protected, they must become as knowledgeable as possible of potential health hazards. Thorough understanding of the principles of this section is essential.

401 Hazardous Materials

1. To reduce the risks of working with hazardous materials, manufacturers of hazardous materials are required to convey hazard information to the users of their products. This is accomplished through the use of Safety Data Sheets (SDS) and container labeling.

2. Employees can obtain an inventory of hazardous materials known to be in their work area from their supervisor.

3. The Safety Data Sheet is the main vehicle for communicating the hazards, safe handling requirements, and emergency procedures for each hazardous material. Employees shall know the location of the Safety Data Sheets for all hazardous materials known to be in their work areas.

4. Safety Data Sheets shall be made available to contractors working on utility property.

5. Employees shall not use materials they find in unlabeled containers. Employees shall report unlabeled containers and containers with damaged labels to their supervisor or Department Manager.

6. Employees shall not transfer a hazardous substance from a labeled container to an unlabeled container unless the unlabeled container will be under the exclusive control of the employee.

7. Employees shall take special precautions when working on or around unlabeled pipes and shall empty, make safe, or label such containers upon completion of job task.

8. Employees shall report all hazardous material spills to their supervisor or Department Manager. Employees shall not attempt to control or clean up spills unless they have been properly trained and have the required personal protective equipment.

9. For additional information concerning the requirements for working with hazardous materials, refer to OSHA standards 29 CFR 1910, Subpart Z; and 29 CFR 1910.120.

402 Confined or Enclosed Spaces

1. For definitions of enclosed, confined, and permit required enclosed spaces refer to definitions in this manual.

2. Employer will evaluate all work spaces to determine whether there are any permit required work spaces.

3. Employees who enter confined or permit required spaces or who serve as attendants shall be trained in the hazards of confined space entry, confined space entry procedures, and permit required confined space rescue procedures.

4. Entry into a confined or enclosed space with an unsafe atmosphere shall be avoided. Employees required to enter a confined or enclosed space with an unsafe atmosphere shall be equipped with a fresh air breathing apparatus, body harness and lifeline monitored by a properly trained attendant. Necessary rescue personnel and equipment shall be available in the event of an emergency.

5. Electric welding, gas welding, cutting or any other hot work shall not be performed on the interior, exterior, or near the openings of any confined or enclosed space

that may contain flammable or explosive gases or vapors until the space has been tested and if necessary, properly cleared.

6. Compressed gas bottles shall not be taken into a confined space.

7. Safe access to the enclosed space shall be maintained at all times. It is recommended that all cords, hoses, leads, etc. shall be routed through an entrance other than the employee access into the enclosed space.

8. This section covers confined spaces that may be entered by employees. It does not apply to vented vaults if a determination is made that the ventilation system is operating to protect employees before they enter the space. The paragraph applies to routine entry into enclosed spaces in lieu of the permit space entry requirements contained in OSHA. If, after the precautions given in OSHA are taken, the hazards of remaining in the confined space endanger the life of an entrant or could interfere with escape from the space, then entry into the confined space shall meet the permit space entry requirements of OSHA.

    a. An attendant shall be kept at the surface when there is any hazard to the employees in the manhole and the attendant should not leave the manhole unwatched until such time as all employees are out and the cover has been replaced.

    b. While work is being performed in a manhole containing energized electric equipment, an employee with first aid and CPR training meeting OSHA requirements shall be available on the surface in the immediate vicinity to render emergency assistance.

    c. No work shall be permitted to be done in any manhole or subway on any energized wire, cable or appliance carrying more than 300 volts of electricity by less than two qualified persons who shall, at all times, while performing such work, be in the same manhole or subway in which work is being

done. This rule shall not apply to work on telephone, telegraph or signal wires or cables.

d. For the purpose of inspection, housekeeping, taking readings, or similar work, an employee working alone may enter, for brief periods of time, a manhole where energized cables or equipment are in service, if the employer can demonstrate that the employee will be protected from all electrical hazards.

9. Employees shall not step on cables or hangers; and will use only approved ladders.

10. When it is necessary to illuminate a manhole or vault, only guarded electric lights shall be used.

11. Manhole, vault, and service box covers shall always be opened and replaced by means of approved hooks or hoists.

403 Fire Prevention and Protection

1. Employees shall familiarize themselves with the emergency exits, alarm signals, and escape procedures when working inside a building or structure. Employers shall have an emergency action plan in accordance with 1910.38(a)(1).

2. In buildings or structures, all fire exits shall be marked. All fire exits and escape routes shall be kept free of obstructions. Fire exits or doors shall not be locked, chained, or barricaded at any time.

3. Employees shall be familiar with both the location and the operation of all fire protection equipment in the vicinity of their work area.

4. Oily rags shall be deposited in a self-closing metal container.

5. Combustible liquids, such as alcohol, gasoline, kerosene, thinners, and solvents shall be kept in fire proof cabinets.

6. Smoking is specifically prohibited in or on all UEC property and shall not be permitted in areas where dangerous gases may be present. Neither shall smoking be permitted in store rooms or battery rooms, or other areas where quantities of combustible materials are kept.

7. All employees shall be trained on the operation of the fire extinguishers. This training should be done annually.

8. All fire extinguishers shall be conspicuously marked and strategically located. Fire extinguishers must not be blocked or hidden behind material or machines. All UEC vehicles shall be provided with a suitable fire extinguisher.

9. A fire extinguisher shall be close at hand when welding on vehicles.

10. Suitable fire extinguishing equipment shall be immediately available in the shop work area and shall be maintained in a state of readiness for instant use.

11. Fire extinguishers shall be inspected visually at least once a month and thoroughly inspected at least annually.

SECTION 5 VEHICLE OPERATIONS

501 General

1. Each operator of a motor vehicle must possess the proper state motor vehicle driver's license for the vehicle they are operating and have it on their person while operating a company vehicle on public roads. Each operator must follow all federal, state, local laws, and UEC rules and regulations governing vehicle operation.

2. Employees operating Company vehicles shall be responsible for the safe operation of that vehicle at all times.

3. Seat belts shall be worn by all drivers and occupants of company vehicles, as well as those vehicles that are driven for company business when traveling on all public roads.

4. It is recommended that when operating vehicles, headlights be on during daytime working hours.

5. Trailers shall meet federal and State requirements for their intended use. Safety devices such as lights, brakes, and approved safety chains shall be checked and utilized.

6. Employees shall not ride on fenders, running boards, side rails, on top of vehicles or on trailers. Employees shall ride in the space provided in vehicles and shall not ride with their legs hanging out the rear or side of any vehicles.

7. Employees shall not get on or off vehicles in motion.

8. No vehicle or equipment shall be operated when a red tag is attached until all repairs are made. Tags shall be attached in an obvious location.

502 Inspection of Equipment

1. No motor vehicle shall be driven unless the driver has satisfied himself/herself that the following parts and accessories are in good working order, nor shall any driver fail to make use of such parts and accessories when and as needed: service brakes, including trailer brake connections; parking brake; steering mechanism;

lighting devices and reflectors; tires; horn; windshield wipers; rear-vision mirrors; coupling devices; wheels and rims; and emergency equipment. (Reference: Federal Motor Carrier Safety Regulations, 396.11).

2. For commercial vehicles, every driver shall prepare a report in writing at the completion of each day's work on each vehicle operated and the report shall cover at least the following parts and accessories: service brakes, including trailer brake connections; parking brake; steering mechanism; lighting devices and reflectors; tires; horn; windshield wipers; rear-vision mirrors; coupling devices; wheels and rims; and emergency equipment.

503 Vehicle

1. Operation

    a. The vehicle shall be operated in a safe manner, and the driver shall yield the right-of-way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle.

    b. The driver shall maintain sufficient distance behind another vehicle to safely stop the vehicle in the clear distance ahead.

    c. Before a vehicle is driven under or adjacent to energized equipment, especially in substation areas, the clearance shall be checked, especially that of the radio antenna, in order to ensure that proper clearances will be maintained between the vehicle and energized equipment.

2. Parking

    a. When vehicles must be parked on the roadway, they shall be parked on the right-hand side in the same direction of traffic flow, whenever possible.

    b. When parking on a roadway, vehicles shall park off the traveled road surface, whenever possible. Trucks or trailers stopped on any public roadway shall be protected by

proper warning lights, cones, reflectors, or red flags in accordance with State or local requirements.

c. Whenever possible vehicles should not be parked on bridges or over culverts.

d. When it is necessary to park on an incline, the driver shall make sure the vehicle is left in a safe position. The engine shall be turned off, the vehicle placed in the lowest gear, or "park" position, and the parking brake set. The front wheels shall be cut into the curb or if a curb is not present, the rear wheels shall be chocked.

3. Backing

a. Whenever practical, the vehicle shall be positioned to avoid the necessity of backing up.

b. Caution shall be exercised when backing a vehicle, to avoid injury to persons and to prevent property damage. When backing a vehicle, which has an obstructed view to the rear, the following precautions shall be taken:

i. A reverse signal (back-up alarm) audible above the surrounding noise level shall be used if available, or an observer shall signal that it is safe to back-up.

ii. Drivers will walk around the vehicle prior to backing up to observe any obstacles or possible obstructions.

iii. Back slowly.

iv. Watch both sides but do not depend entirely on mirrors.

v. In any difficult backing situation, enlist the help of another person on the ground as a guide.

vi. When an observer is unavailable, the driver must stop the vehicle and

personally check the travel path before backing into any blind spots.

504 Operating Off Road Vehicles (ORV)

1. Except for the purpose of training, only qualified persons who are familiar with the equipment shall be allowed to operate the ORV.

2. Communications (Radio or Cell Phone) shall be established whenever possible while operating the ORV.

3. During the period of darkness, while patrolling lines, at least one journeyman, in addition to the operator, shall ride on the vehicle.

4. Extreme caution shall be maintained when it is necessary to operate the ORV on roads or highways.

5. Snowshoes, shovel, first aid kit, fire extinguisher, and two-way radio shall be part of the equipment on the ORV while it is in operation.

505 Hauling Poles, Materials, and Equipment

1. Any material or equipment that is loaded with over 4 inches of overhang on either side of the vehicle shall be flagged.

2. Materials shall be securely fastened to prevent a hazard due to shifting.

3. Material that extends more than 4 feet beyond the front or back of the truck or trailer shall have warning devices attached. During the day, orange or red flags, which are at minimum 12 inches square in size, shall be used. At night and during periods of poor visibility, red lights shall be used.

4. A DOT permit shall be required when hauling poles or equipment under the following circumstances:

    a. When the length of a single vehicle and load exceeds 45 feet in length.

    b. When the length of a combination of single vehicle and trailer exceeds 75 feet in length.

c. When the width of the load exceeds 8.5 feet in width.

5. For additional information on Pole Weights, refer to Tables A2, A3, and A4 in Appendix A.

6. During pole hauling operations, all loads shall be secured to prevent displacement and a red flag shall be displayed at the trailing end of the longest pole.

7. When hauling poles during the hours of darkness, illuminating warning devices shall be attached to the trailing end of the longest pole.

8. Precautions shall be exercised to prevent blocking of roadways or endangering other traffic.

9. When the rear overhang exceeds 1/3 the length of the wheelbase of the front-most axle to rear-most axle, a rear pilot car is required.

10. Trailer and dolly wheels shall be securely braked or blocked before loading.

11. While loading poles, employees shall not stand between the pole pile and the loading or transporting equipment.

12. At least 2 persons shall be engaged in the loading and unloading of poles and other material when using a boom truck.

13. Bolster type loads shall be loaded in a pyramidal fashion. Each layer shall be securely rested on the one below.

506 Industrial Trucks – Fork Lifts

1. Industrial trucks shall be operated only by authorized persons who are qualified and trained in their use.

2. All forklifts and payloaders must have an overhead guard, strobe light, and back up alarm.

3. Make a complete safety check of the machine prior to the beginning of each day.

4. Machines must never be started without the operator being in the driver's seat.

5. Forklifts shall not carry passengers.
6. Forks shall be carried in the lowest position possible.
7. Avoid quick starts, stops and quick turns and use extreme caution at blind corners. Always drive machines under control.
8. Always maintain a safe distance from the edge of ramps or platforms.
9. Arms and legs shall not be extended beyond the edge of the truck.
10. When picking up loads, approach slowly with forks at proper elevation to avoid striking load.
11. Loads should be picked up on center and placed all the way on the forks.
12. Loads shall never be lifted which are heavier than the designated load capacity of the machine. No counterweight shall be added to increase lifting capacity unless approved by the manufacturer.
13. Extreme care shall be used when tilting the load forward or backward, particularly when high tiering.
14. Loads shall not be allowed to obstruct view. If a bulky load must be carried, drive the truck backwards.
15. Back down ramps when carrying loads to prevent load from slipping.
16. Avoid bumping or brushing objects with the truck or load.
17. The operator shall never leave his machine unattended without neutralizing or locking the controls, setting the brakes, and lowering the forks. Wheels shall be chocked when parked on an incline.
18. A forklift shall not be used to elevate anyone, unless an approved platform, firmly secured to the forks, is used. The platform must be firmly secured to the lifting carriage or the forks, equipped with guardrails, and have a barrier that prevents contact with the mast. The operator must stay with the forklift when workers are

on the platform. The combined weight of the platform and workers should be less than one-half of the forklift's rated capacity. A fall arrest system is required anytime a working height of 6 feet or more is reached

507 Cranes, Derricks, Hoisting Equipment

Crane operators shall have an approved certification according to OSHA regulations. The crane shall be grounded, when operating within 20 feet of an energized conductor.

1. Only authorized persons shall be permitted in the cab or on the equipment. Only those designated persons who are trained and qualified shall operate the hoisting equipment.

2. No person shall be permitted to ride the hook, sling, or load of any hoisting equipment.

3. Load limits as specified by the manufacturer shall not be exceeded under any circumstances. The load chart for the crane shall be consulted before lifting loads.

4. Operating and maintenance procedures as specified by the manufacturer shall be followed.

5. The following minimum inspections should be performed DAILY before use except where noted:

    a. All control mechanisms for maladjustment interfering with proper operation.

    b. All safety devices for malfunction.

    c. Deterioration or leakage in air or hydraulic systems. (Before each use).

    d. Hooks, hoist lines, slings, and load attachment devices.

    e. Fire extinguisher available (5 BC or larger).

6. Before a lift is attempted, the lifting mechanism shall be firmly supported with the hoist line centered over the center of gravity of the load to be lifted.

7. No load shall be lifted until its weight has been determined.

8. With every load, the slings and bindings shall be checked and shall be readjusted as necessary to ensure safety and stability.

9. Proper signals to the equipment operator shall be given by one person designated to perform this task. The operator shall, however, obey a "Stop" signal given by anyone.

10. No employee shall be under a suspended load or inside the angle of a winch line. No employee shall stand or work near a cable, chain, or rope under tension unless the nature of their work requires it.

11. Winch lines, ropes, or wire cables shall not be guided by hand when standing within reach of the drum or sheave.

12. Operators shall not leave their position at the controls of cranes, hoists, derricks, or other lifting devices while the load is suspended.

13. Trucks on which derricks or booms are erected above traveling height shall not be moved except under the immediate direction of a designated employee, who shall give his/her undivided attention to the movement.

14. If it is difficult for the operator to determine the distance between the equipment and the energized parts accurately, another person shall observe the clearance and give timely warnings when minimum distance is approached.

508 Rigging Equipment

1. All rigging equipment shall be sufficient strength, proper type, and safe for its intended use.

2. Rigging equipment shall not be loaded beyond its rated capacity.

3. Each day before use, all slings, fastenings, and attachments shall be inspected for damage or defects by a competent person. Damaged or defective equipment shall be immediately removed from service.

4. All slings for overhead lifting shall be inspected and tagged in accordance with 29 CFR 1910.184(e) and ANSI B 30.9-1984.

5. Makeshift links or fasteners formed from bolts or rods or other such attachments shall not be used.

6. Slings shall not be shortened with knots, bolts, or other makeshift devices.

7. Slings used in a basket hitch shall have the load balanced to prevent slippage.

8. Slings shall be securely attached to the load.

9. Slings shall be padded or protected from the sharp edges of their loads.

10. A sling shall not be pulled from under a load when the load is resting on the sling.

11. Slings shall be long enough to provide the maximum practical angle between the sling leg and the horizontal plane of the load.

12. Only shackles approved for lifting shall be used. Shackle pins shall never be replaced with bolts or other non-approved devices.

13. Hooks shall never be rigged so that they are point loaded at the tip of the hook. The load shall be securely seated in the saddle of the hook.

14. Devices shall not be side loaded when they are not designed to withstand such loading.

15. Conductive rigging (wire rope) shall not be used to raise poles, transformers, or other equipment except when such rigging is below, protected, or at a sufficient distance from energized high voltage conductors to prevent hazardous contact.

509 Aerial Devices

1. Only authorized persons who are properly trained and qualified shall use or operate aerial devices.

2. The operating and maintenance instruction manuals issued by the manufacturer shall be followed. The manufacturer's operating manuals shall be stored on the vehicle at all times for reference. (Reference: ANSI 92.2).

3. Load limits of the boom and basket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided.

4. Prior to use, the equipment shall be given a warm-up period. The hydraulic system and the lift controls shall be checked and tested daily before use to determine if such features are in safe working condition. Malfunctions or unsafe operational conditions shall be reported. Equipment that is not in safe operating condition shall not be used.

5. Articulating boom and extensive boom platforms, primarily designed as personnel carriers, shall have both platforms, upper and lower controls. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in cases of emergency. All employees on the crew shall be trained in the operation of the lower (override) boom controls.

6. Employees shall not ride in the bucket while the truck is traveling. Exception: Employees may ride in the bucket for short moves at the work location if the bucket is returned to the cradle position for each move.

7. When employees are in the bucket of an aerial lift, the emergency brake of the vehicle shall be set. Wheel chocks shall be used regardless of whether outriggers are used. The truck should sit approximately level when viewed from the rear.

8. When outriggers are used, they shall be set on pads or a solid surface. Outriggers shall not be extended or retracted outside of clear view of the operator unless all employees are outside the range of possible equipment motion.

9. Employees shall not belt to an adjacent pole or structure when working from aerial lift.

10. When working from an aerial lift, a harness shall be worn with a lanyard attached to the manufacturer's established point.

11. Safety rules governing the use of hot-line tools, rubber goods, personal protective equipment, and general safe practices shall also apply to work done from aerial buckets.

12. When a boom must be maneuvered over a street or highway, necessary precautions shall be taken to avoid accidents with traffic and pedestrians. Approved warning lights shall be operating and visible to oncoming traffic when the boom is in position over traveled area.

13. Employees shall not stand or sit on top or edge of the bucket or on ladders placed in the bucket.

14. Climbers shall not be worn by employees while in the bucket.

15. When two employees are working from the bucket, extreme care shall be taken to avoid one employee contacting poles, crossarms, or other grounded or live equipment while the second employee is working on equipment at a different potential.

16. The rated load capacity shall be posted at a conspicuous place and be kept in a legible condition.

17. Clearances: Mechanical equipment shall be operated so that the minimum approach distances of Tables A14 and A15 in Appendix A are maintained from exposed energized lines and equipment. However, the insulated portion of an aerial lift operated by a qualified employee in the lift is exempt from this requirement. If it is difficult for the operator to determine the distance between the equipment and the energized parts accurately, another person shall observe the clearance and give timely warnings when minimum clearance distance is approached.

18. When using pneumatic or hydraulic tools in a bucket, the operator shall be sure that hoses or lines do not become entangled in the operational controls.

    Aerial Bucket vehicles working adjacent to energized primary shall be properly grounded or barricaded and treated as energized.

19. It is recommended that the bucket be considered an uninsulated portion of the truck and that a tested, insulated, liner be used if insulating is required.

510 Traffic Control

1. All State and local traffic codes shall be followed when providing work area protection; all flaggers must be certified.

2. During night operations or in periods of reduced visibility, special precautions shall be taken. Adequate warning equipment, which may include flashing lights, flares, or area illumination, shall be used.

3. Warning devices and equipment shall be removed as soon as the hazard is eliminated.

4. Only those signs, standards, barricades, flags, and cones that conform to State or local codes shall be used.

5. Flaggers or other appropriate traffic controls shall be used to supplement protection provided by signs, signals, and barricades whenever necessary.

6. During the time vehicles are parked on the roadway, warning flashers, strobes, traffic cones, and warning signs shall be used as specified in the Manual on Traffic Control Devices (MUTCD). During time vehicles are parked adjacent to roadways, not in the traveled way; warning flashers, strobes, traffic cones, and warning signs shall be used as applicable.

SECTION 6 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

601 General

Each employer shall establish a written Lockout/Tagout program and provide training to employees as required by 29 CFR 1910.147 for control of hazardous energy.

602 Lockout/Tagout

1. Scope: This covers the servicing and maintenance of machines and equipment in which the unexpected energization or startup of the machines or equipment or release of stored energy could cause injury to employees.

2. Before starting work on any circuit, machine, belting, shafting, or other apparatus that is out of service, employees shall assure themselves that the apparatus is physically rendered inoperative and a standard tag and/or lockout device is properly attached to the apparatus control.

3. No switch, governor, valve, throttle, or other device used to put a circuit or equipment into service shall be operated while a tag or lock is attached to it.

4. A tag or lock that has been placed for the protection of workers shall be removed only by authorization of the person in whose name it was placed and then only after the work has been completed and the workers and tools are in the clear.

5. Each employee in charge of work on any equipment shall have his or her tag and/or lock device secured to the apparatus control.

603 Clearance and Dispatching

1. Clearance – notification from an authorized person that all necessary actions have been taken to de-energize a circuit, line, or equipment and the line or equipment is safe to be worked, so that workers may be authorized to proceed with intended operations.

2. Only qualified persons shall be designated to act in the

capacity of power dispatcher, load dispatcher, or system operator.

3. No person shall work on any station equipment without first obtaining proper authorization from authorized Operations personnel. The person desiring to work shall specifically state what work s/he intends to do, what equipment is to be worked on, and the area in which s/he will be working.

4. Clearances are required to work on de-energized substation apparatus, or lines which are normally energized above 600 volts, except on short distribution tap line sections which have a single source of supply.

5. Operations shall be notified when it is necessary to de-energize or energize lines that do not require a clearance.

6. When de-energizing lines or equipment and the means of disconnecting from electric energy are not visibly locked out, the following requirements shall be met:

    a. The section of line or equipment to be de-energized shall be clearly identified, and it shall be isolated from all sources of voltage.

    b. All switches and disconnectors through which electric energy may be supplied to the line or equipment to be worked on shall be de-energized.

    c. All switches and disconnectors shall be plainly tagged indicating that men are at work.

    d. When the design of switches and disconnectors permit, they shall be rendered inoperable.

    e. Clearance shall be requested from the dispatcher or person acting in that capacity on all circuits and equipment under his/her control.

    f. Workers shall obtain the name of the dispatcher when requesting clearance.

    g. The dispatcher shall obtain the name of

the person requesting clearance and assure themselves that the person is qualified to receive such clearance.

h. The person requesting the clearance shall state exactly what circuit or equipment s/he wants de-energized and the reason.

i. The dispatcher shall repeat the request and be certain that the request is fully understood.

7. It shall be the responsibility of the supervisor to make certain that equipment to be operated or worked upon is properly designated by name or number. All employees shall use such established names and numbers in identifying equipment.

8. The circuit or equipment shall be considered as energized until notification from the dispatcher to the contrary is received.

9. Before considering any circuit or equipment de-energized, the dispatcher shall assure himself/herself that all switches which could possibly energize the circuit or equipment in question have been opened, all phases checked, tagged with "Men Working" or "hold" tags, and locked or blocked in the open position. Only a visible air break shall be regarded as clearing a circuit.

10. After receiving notification from the dispatcher that the circuit or equipment is de- energized, the person making the request shall take the following precautions before coming in contact with the circuit or equipment:

    a. The circuit or equipment shall be tested to make sure that it is de-energized.

    b. The circuit or equipment shall be grounded and shorted as prescribed by the grounding section of these rules.

    c. Guards or barriers shall be erected as necessary to prevent approach or contact with adjacent energized lines or equipment.

11. No one shall contact a circuit or equipment that has been taken out of service to be worked on until they are

assured that the circuit or equipment is cleared, tagged and grounded.

12. When more than one independent crew requires the same line or equipment to be de-energized, each crew must have the de-energized circuit cleared and tagged for it individually, unless working under the direct supervision of a single foreman or supervisor who has the circuit or equipment cleared and tagged.

13. Upon completion of work on de-energized lines or equipment, each designated employee in charge shall determine that all employees within the crew are clear, that protective grounds installed by the crew have been removed, and then report to the designated authority that all tags protecting the crew may be removed.

14. If two or more workers are required to do a job on a circuit or equipment which has been removed from service; each worker must understand who is in charge and responsible for clearance.

15. A dispatcher shall not authorize any person to energize the circuit or equipment that has been taken out of service for the purpose of having work done on it until all persons having clearances on such circuit or equipment have released their clearances and authorized their "Hold" or "Men Working" tags to be removed.

16. No person shall operate a switch to which "Hold" or "Men Working" tags are attached.

17. If something should happen which renders it impractical to contact an individual who had a clearance on a given circuit or piece of equipment, that clearance may be released only by order of the highest available operating supervisor having jurisdiction over the circuit or equipment. Such order shall be confirmed in writing to the dispatcher for the record.

18. No person shall remove any "Hold" or "Men Working" tags for any purpose without the authorization of the dispatcher.

19. Persons to whom a clearance has been given shall be held responsible for removing all protective grounds and shorts installed by them or under their direction, before releasing the circuits or equipment to the

dispatcher for service.

604 Switch and Breaker Identification

1. General

    a. The primary goal of UEC's switch and breaker identification standard is to simply ensure every device is assigned a unique number.

    b. While in some cases these standards do include codes which represent the functional specifications and/or physical orientation of a device, it is not our goal to assign identification codes from which a complete picture of the device capabilities, physical location, and/or electrical orientation can be determined.

    c. UEC personnel should not rely on switch and breaker identification codes as the sole means for determining such things as the orientation of device terminals with respect to electrical source and load, whether a device has load-break capabilities or not or the voltage or current ratings of a device.

    d. Prior to implementing switching orders, UEC personnel should cross reference switch and breaker identification codes with written switching orders, one-line diagrams and other electrical schematics whenever possible.

    e. Switch and breaker identification codes are designed to complement implementation and administration of UEC's Supervisory Control and Data Acquisition (SCADA) system.

2. Transmission and Distribution Field Switches

    a. Transmission and distribution field switches shall be uniquely identified by using an alphanumeric code consisting of three letters followed by three numbers; for example DLP381.

b. The alpha code shall be as specified in the following paragraphs. The number portion of the code shall be a unique number from a sequential list. Administration and control of this list shall be as described in the following paragraphs:

c. Alpha Code

i. First position:

a. T = transmission

b. D = distribution

ii. Second position:

a. L = load break (gang operated)

b. N = non-load break (gang operated)

c. S = single-pole non-load break

d. X = single pole load-break

iii. Third Position:

a. C = switch in transmission line

b. P = distribution parallel switch

c. A = pad mounted switch gear

3. Substation Circuit Breakers, Switchers, and Reclosers

a. Distribution Circuit Breakers and Reclosers

b. These devices applied at distribution voltages in a substation shall be uniquely identified by using an alphanumeric code consisting of two letters followed by up to two numbers; for example WE6 or WE10.

i. The two letter alpha code shall consist of the UEC approved abbreviation for the substation.

ii. The numerical code shall be based on a unique number assigned to the physical location of the switching device in the substation. For example a feeder breaker may be assigned numerical designation 1 to indicate its

location in the first physical position in a row of breakers; i.e. Bay 1.

iii. Physical location numbers in the substation shall be unique, beginning with the number 1 and continuing sequentially until all locations are identified. The starting point for the numbering is not critical but should follow a sensible pattern of sequential numbering of locations adjacent to one another whenever possible.

iv. The intention of numbering the physical locations is to ensure switching devices such as circuit breakers and reclosers can be changed out without having to change the identification number of the device occupying a particular location in the substation.

c. Transmission Circuit Breakers and Circuit Switchers

i. These devices applied at transmission voltages in a substation or switching station shall be uniquely identified following the same concept used for distribution circuit breakers and reclosers with the addition of the letters T and L preceding the substation and physical position identification.

ii. For example TLWE15 would be the identifier for a transmission rated breaker at Westland substation in a physical position assigned number 15 consistent with transmission switch numbering standards the letters T and L represent transmission and load break respectively.

d. Transmission Isolation Switches

i. Isolation switches associated with transmission voltage rated substation or switching station circuit breakers and circuit switches shall be uniquely

identified by using the substation and physical position codes associated with the breaker or switch for example TNWE15A would be the identifier for an isolation switch associated with circuit breaker TLWE15.

ii. TL and TN prefixes indicate transmission load-break and transmission non load-break respectively. A, B and C, etc. code letters simply indicate the switch is to one side or another of the device to be isolated.

iii. Where only one isolation switch exists it shall be assigned the letter A. Where two isolation switches exist, the assignment of the A and B positions is arbitrary but should be consistent within a particular substation or switching station.

e. Distribution Circuit Breaker and Recloser Isolation Switches

i. Isolation switches associated with substation distribution circuit breakers and reclosers shall be uniquely identified by using the associated breaker or recloser identification followed by an additional single letter to indicate its physical position relative to the electrical source (main bus = B) and load (distribution feeder line = L). For example, WE6B refers to the source side isolation switch associated with Westland (WE) substation bay-6 feeder circuit breaker.

ii. Distribution rated isolation switches shall be shown on reference drawings with identification denoted. However, these switches will not have a physical identification tag due to the lack of a practical location for mounting.

f. Distribution Auxiliary Bus Feeder Switches

i. Auxiliary bus switches associated with

distribution feeders shall be uniquely identified by using the associated breaker or recloser identification number for the feeder followed by the letter A to indicate connection to the auxiliary bus. For example WE6A identifies the auxiliary bus switch associated with the bay-6 feeder at Westland substation.

ii. Gang-operated auxiliary-bus feeder switches shall be physically numbered in the substation while single-pole switches used in the same application may not.

g. Distribution Bus Tie Switches

i. Distribution bus tie switches shall be uniquely identified starting with the substation abbreviation and interconnected bay numbers separated by a hyphen and then followed by the designation of the bus as B (Main Bus) or A (Auxiliary Bus). The interconnected bay numbers shall start with the lowest number first. For example HB5-6A would be the identification for the auxiliary bus switch connecting distribution bays 5 and 6 at Hermiston Butte substation.

4. Other Substation Transmission and Distribution Switches

a. Substation switches not associated with a distribution feeder bay or transmission circuit breaker or circuit switches shall be identified using an alphanumeric code consisting of two letters followed by the approved substation abbreviation and a unique number assigned to identify the physical location of the switch; for example DNHB13 or TLWE15.

b. The two letter alpha code shall adhere to the first and second position codes identified in

1 and 2 above.

c. The substation abbreviation and unique number shall adhere to standards identified in 1and 2 above.

Feeder Identification

1. Distribution feeder identification must meet two basic requirements. These include unique identification for the purposes of record keeping and identification to support day-to-day system operations.

2. In order to meet record keeping requirements distribution feeders shall be identified by the alphanumeric code of the circuit breaker or recloser located in the distribution bay in which the feeder originates. For example Feeder HB1 identifies the feeder terminated in Hermiston Butte substation distribution bay 1.

3. To support system operations a text based unique identity shall be defined for each feeder.

    a. The text shall not exceed fifteen characters and should use combinations of directions, streets, geographical area and/or the name of a dedicated customer load to create a practical and recognizable identity.

    b. Text based feeder identification shall be recorded and controlled on approved substation one-line diagrams, including one-line's used for SCADA screens.

4. Labels with feeder text identification shall be attached to the substation "get-away" and riser conduits or on switchgear panels/doors as applicable.

5. Cable terminations in the substation shall be identified with tags indicating "To grid number" where the grid number is that associated with the riser pole or switchgear whatever the case may be.

6. Cable terminations at the riser pole or switchgear shall be identified with tags indicating the "From bay number" where the bay number is the alphanumeric

code assigned to the distribution breaker or recloser bay; for example "From HB1".

605 Tags For Hazardous Energy Control

This section is intended to define the purpose and physical attributes of tags used in UEC's hazardous energy control procedures. See Transmission and Distribution Overhead Rules, Section IV, Paragraph 335, Clearance and dispatching for hazardous energy control procedures.

1. General

    a. Hold/Clearance tags shall be red in color. UEC uses the same tag for establishing holds and clearances.

    b. Caution Tags shall be yellow in color and are only to be used to advise operating personnel of temporary and/or unusual conditions or situations. Caution tags shall not be used in place of hold/clearance tags.

    c. Tags and their means of attachment shall be made of materials which will withstand the environmental conditions in which they are applied.

2. Hold/Clearance Tags

    a. Hold/Clearance tags shall include the words "Danger" and "Do Not Operate" and at a minimum include the fields shown.

    b. A hold tag is placed on a recloser control or protective relay which has had the automatic reclosing feature disabled. This is commonly referred to as placing a device in the "one shot" mode. Hold tags are used when performing work on energized circuits in accordance with UEC's established "hot work" operating practices.

    c. A clearance tag is placed on an energy

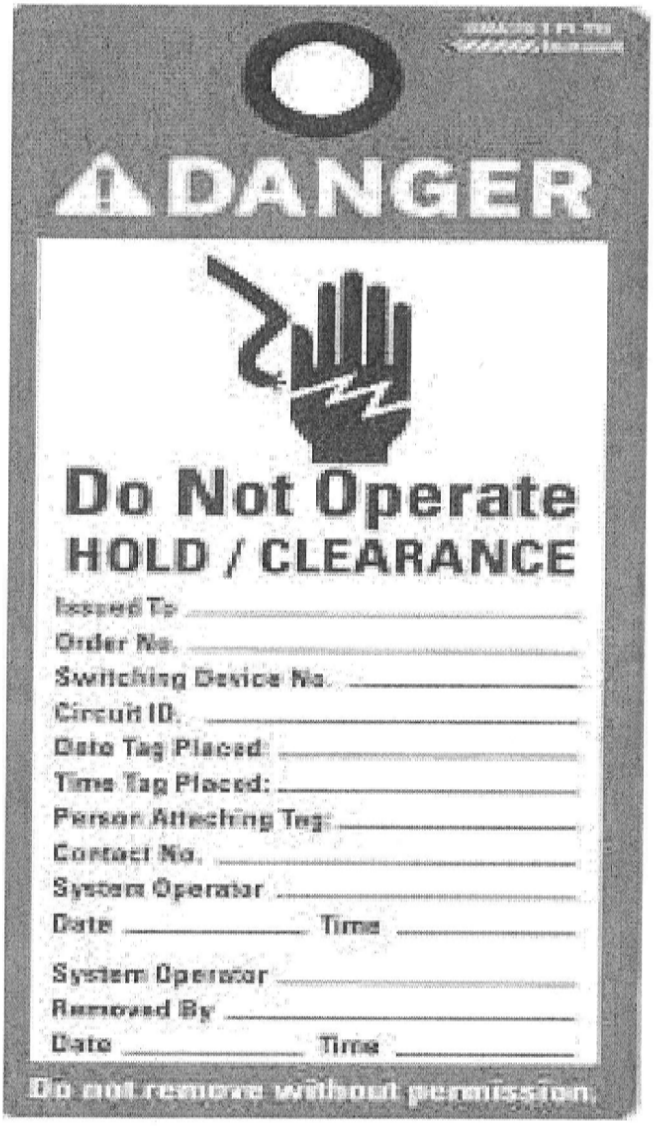


Figure 1. Hold/Clearance tag
Red in color.

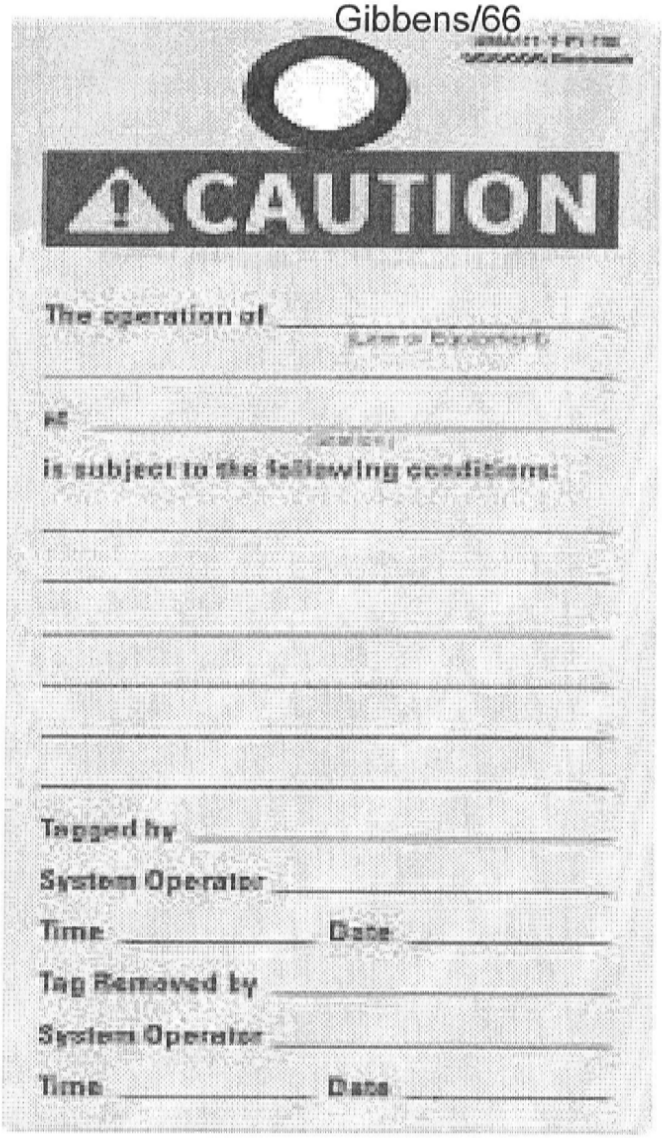


Figure 2. Caution tag.
Yellow in color.

isolation device which has been opened in order to establish circuits as de-energized in accordance with UEC's hazardous energy control procedures.

d. Hold/Clearance Tag Field Definitions

i. Issued To: A required field that identifies the employee in charge.

ii. Order No.: A sequential number administered and controlled by the system operator. Order numbers are

required when a system operator is on duty.

iii. Switching Device No.: A required field which represents the unique identification number affixed to the switching device or related recloser control or protective relay for which the hold or clearance applies.

iv. Circuit ID: Optional text used to describe a feeder or portion of a circuit in order to establish a general point of reference.

v. Date/Time Tag Placed: Required fields identifying the date and time a tag is actually attached to a device.

vi. Person Attaching Tag: A required field which identifies the person attaching a tag. This may be the person a tag is issued to or someone they designate to physically attach the tag. Regardless of who attaches the tag, the person who the tag is issued to is responsible for verifying proper placement prior to performing work and proper removal after work is completed.

vii. Contact No.: A required field which identifies the truck radio, cellular or other telephone number at which the person issued the hold/clearance can be contacted.

viii. System Operator, Date, Time: The designated system operator on the date and at the time the hold or clearance was issued.

ix. System Operator, Removed By, Date, Time: The designated system operator at the time the hold or clearance is removed, who removed it and the date and time removed.

3. Caution Tags

a. Caution tags shall be of the design shown (or equivalent) and at a minimum include the fields shown.

b. Caution Tag Field Definitions

c. The operation of (Line or Equipment): A required field which identifies the circuit, equipment or system to which the caution applies.

d. At (Station): A required field which is intended to complete the identification of the location where the caution tag applies.

e. Is subject to the following conditions: A required field which provides a complete description of the conditions warranting caution.

f. Tagged by, System Operator, Time, Date: Required fields identifying the person responsible for initiating the tag, the designated system operator at the time and on the date the caution tag was issued.

g. Tag Removed by, System Operator, Time, Date: Required fields which identify who removes a tag, who is the designated system operator and he time and date the caution tag is removed.

4. After a hold/clearance or caution tag has been used and removed from service it shall be turned in to the operations department for filing.

606 SCADA Operations

1. Only individuals verified to be qualified and approved by the Operations Manager may perform operations using the SCADA system terminal.

2. Names of individuals with SCADA operating authority will be posted prominently near the SCADA terminal.

3. If an authorized SCADA operator is not available, then manual methods must be used.

4. Individuals with SCADA operating authority will be approved to perform functions in one of the following classifications. Only Class 1 approved employees may function as the System Operator for SCADA functions.

a. CLASS 1 - FULL SCADA OPERATIONS

   i. Screen browsing
   ii. Alarm acknowledgement
   iii. Alarm set point modification
   iv. Create and remove clearance or hold tags
   v. Regulator raise and lower functions
   vi. Reclose enable and disable
   vii. Ground trip enable and disable
   viii. Alternate minimum trip enable and disable
   ix. Circuit breaker/switch open and close functions

b. CLASS 2 – SCADA MAINTENANCE

   i. Screen browsing
   ii. Alarm acknowledgement
   iii. SCADA system troubleshooting
   iv. SCADA software maintenance and upgrades

c. CLASS 3 – ADMINISTRATIVE

   i. Screen browsing
   ii. Alarm acknowledgement

5. While linemen are encouraged to take advantage of SCADA for issuance of holds, it is not required. The ultimate decision as to the methods to be used to establish a safe work environment lies with the individual work leader.

6. It is the responsibility of the lineman requesting a hold to identify the feeder and circuit breaker reference number. This will require review of available substation one-line diagrams and maps and/or physically visiting the circuit breaker/recloser.

7. Copies of one-line diagrams used in UEC's SCADA shall be provided to all who might be in the position of requesting a hold tag.

8. Upon receiving a request for the issuance and application of a SCADA hold tag, the system operator will confirm the hold request and then double check the request to ensure there is no confusion regarding the location of the hold and that the request is appropriate for the work to be performed.

9. The system operator will then perform the computer functions necessary to issue the hold and communicate the hold number to the requestor.

10. All communications shall be via the radio system, unless radio communication is not present.

11. Except in rare circumstances, SCADA hold tags should not be applied until the crew is at the job site and preparing to commence work.

12. Setting up a SCADA Hold/Clearance Tag

    a. Follow these steps when issuing a Hold/ Clearance for a device located in the field or non-SCADA controlled substation

        i. From the system overview screen, click on "issue a system level Hold/ Clearance" to begin the process. A blank tag as shown in the following picture will appear on the screen.

        ii. Issued to: Name & Contact Number: Click the mouse on the ######## and type the name of the person who will be issued the hold/clearance and the phone number at which they can be reached. Press the Enter key. Up to five individual names and phone numbers may be entered to allow for over tagging. When over tagging, all names listed must release their hold/clearance before the tag can be removed.

        iii. Type: H or C may be selected depending on if you are setting up a "Hold" or "Clearance" tag. Click on the # symbol to enter or change the type. Press the Enter key.

        iv. Order No: This field will be

Figure 3. SCADA Hold/Clearance tag.

automatically generated once the tag is activated.

v. Switching Device: Click on the ######## field and enter the unique identification of the switch or other device at which the hold/clearance is applied.

vi. Circuit ID: Click on the ######## field and enter the approved descriptive name of the circuit if applicable; i.e. North Highway 395.

vii. Date and Time Tag Placed: This field will be automatically generated once the tag is activated.

viii. System Operator: Click on the ######## and enter the name of the acting System Operator. If it is after hours and you are setting a tag for yourself then you will enter your name here. Once the form is filled out, click on the "Activate Tag" button.

ix. EXIT: Click on exit button and the tag will minimize and move to the upper left corner of the screen. Click on the hole in the minimized tag. A tack should appear. Place the mouse on the blue portion of the minimized tag, hold down the click button and drag the tag to the approximate area of the device or circuit. Click on the tack – it should disappear and the tag will stay in that location.

Figure 4. Small red tag for use on map in the SCADA room.

x. Log the issued hold/clearance number in the log book located near the SCADA terminal.

xi. Place an electronic tag on the SCADA screen in the appropriate location to indicate a tag has been set.

b. Follow these steps when issuing a Hold/ Clearance for a device located in a SCADA controlled substation.

i. Click on the device symbol.

ii. Click on "Set up a Hold/Clearance Tag". A tag as shown in the previous picture will appear.

iii. Complete the process as described above for a general system tag with the exception of minimizing the tag. Rather than minimizing, click on the "Go to One Line" button and you will see a T displayed next to the tagged device.

c. Qualified employees are encouraged to set their own tags prior to going to the job site. When so doing, the system operator on duty must be notified of such action. In the case of hold tags the device should not be placed in the "non-reclose" mode until the crew is on site and prepared to begin work.

13. Removing a Hold/Clearance tag:

a. Before removing a Hold/Clearance tag, the person(s) to whom the tag has been issued must personally give specific instructions to do so. Exceptions shall be addressed following UEC's approved hazardous energy control procedures.

b. The system operator or person acting in such capacity shall ascertain from the tag holder that work has been completed, personnel and equipment are in the clear and line and/or equipment is ready to be returned to normal operation. The system

operator and person(s) releasing the hold must make specific reference to the affected switch or device and the assigned specific hold or clearance number identified on the tag.

c. The Removed By, Date, and Time fields will not appear until all names have been cleared from the "Issued To:" fields. Once the hold/clearance has been released by all affected parties enter the name of the person or in the case of over tagging the name of the final person, releasing the hold/clearance in the "Removed By" field. Find and click on the "Clear Tag" button. The Date and Time fields will be automatically updated.

d. Restore the device or line to normal operation and then click the EXIT button to end the process.

e. Log the tag removal in the log book located next to the SCADA terminal.

f. All field tags shall be turned into operations and kept on file.

607 Issuing Tags to Outside Companies or Utilities

1. During normal working hours hold/clearance tags shall only be issued to outside companies or utilities through the UEC system operator. Such requests after hours may be accomplished through the supervisor serving as the technical on call employee.

2. Hold/Clearance tags issued to an outside company or utility shall only be issued to the person in charge at the work location with the exception of an electric utility who has a designated system operator or dispatcher.

3. When issued to another utilities' system operator or dispatcher, a twenty-four hour phone number shall be provided and recorded in the "Contact No." field on the SCADA tag. The name of the outside companies' system operator or dispatcher on duty at the time a tag is issued shall be recorded in the SCADA log book.

4. The hold/clearance may be released by the outside utilities system operator or dispatcher on duty at the time of release.

5. When a hold or clearance is issued to the person in charge at the job site who represents an outside company or utility, a reliable method of communication shall be verified and logged on the electronic SCADA tag in the Contact No. field. In these instances, the Hold/Clearance may only be released to the person to whom it was issued.

608 Switching Orders

1. Written switching orders are required when performing any substation, distribution and transmission switching with the exception of circuit breaker (recloser) open and close operations required to re-energize a distribution feeder from its normal source position following an outage.

2. All substation, distribution and transmission switching orders must be reviewed and approved by the acting system operator prior to execution.

3. Line personnel shall notify the system operator by radio prior to, and at the completion of, switching operations.

4. The original of all active switching orders shall be posted on the cork board located to the left of the SCADA terminal. A copy of the original shall be used by line personnel to execute the switching. The person performing switching operation and the time shall be noted on the field copy.

SECTION 7 GROUNDING FOR EMPLOYEE PROTECTION

701 Grounding

General Statement: The purpose of a distribution grounding procedure is to provide personal protection for the worker on de-energized power lines or equipment. The main purpose of personal protective grounding is to limit the voltage difference between any two accessible points at the work site to a safe value.

To assure this safety factor, protective personal grounds shall be used when working on de-energized power lines or equipment. No electrical circuit, equipment or apparatus is to be considered safe for work until it is de-energized, tested and grounded.

Equipotential grounding is the safest and preferred method of personal protective grounding. Employees may use whatever approved grounding method they prefer as long as employees are protected. For employees working at elevated positions on poles and towers, single point grounding may be necessary, together with grounding straps to provide an equipotential zone for the worker. Employees in insulated aerial lifts working at midspan between two conductor supporting structures may be protected by grounding at convenient points on both sides of the work area. Bonding the aerial lift to the grounded conductor will ensure that the employee remains at the potential of the conductor in case of a fault. Other methods may be necessary to protect workers on the ground including grounding mats and insulating platforms. (Reference: 29 CFR 1910.269(n) (3)).

1. General Rules

    a. All conductors shall be considered energized until properly identified, isolated, tested, and grounded.

    b. New lines or equipment may be considered de-energized and worked as such where:

        i. The lines or equipment are grounded, or

ii. The hazard-induced voltage is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

c. Voltage testing: De-energized conductors and equipment, which are to be grounded, shall first be tested for the presence of voltage with an approved tester.

d. Grounds shall be placed at the work location or grounds shall be placed between work location and all sources of energy and as close as practicable to the work location. If work is to be performed at more than one location in a line section, the line section must be grounded and short-circuited at one location in the line section and the conductor to be worked on shall be grounded at each work location. The minimum approach distances shown in Tables A14 and A15 shall be maintained from ungrounded conductors at the work location. Temporary protective grounds shall be placed at equipotential zones and arranged in such a manner to prevent exposure to hazardous differences in electrical potential.

702 Attaching and Removing Grounds

1. When attaching grounds, the ground end shall be attached first, and the other end shall be attached and removed by means of live-line tools.

2. When removing grounds, the grounding device shall first be removed from the line or equipment using insulating tools.

3. Testing without grounds: Grounds may be temporarily removed only when necessary for test purposes and extreme caution shall be exercised during the test procedures.

4. Grounding electrode: When grounding electrodes are

used, such electrodes shall have a resistance to ground low enough to remove the danger of harm to personnel or permit prompt operation of protective devices. Grounding conductors shall also have an impedance low enough so that they do not delay the operation of protective devices.

5. Grounding to a tower: Grounding to tower shall be made with a tower clamp capable of conducting the anticipated fault current.

6. Ground lead: A ground lead, to be attached to either a tower ground or driven ground, shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No.2 AWG copper.

7. If making a ground is impracticable or the conditions resulting there from would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted and the line or equipment worked as energized using approved live-line methods.

703 Grounding – URD

Note: A capacitance charge can remain in a URD cable after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to such cables.

1. All URD cables and equipment will be considered to be energized until properly identified, isolated, tested and grounded. It is recommended that all underground cables carrying greater than 600 volts be grounded by utilizing proper procedures and equipment, i.e. spiking tool and/or appropriate hot cutters.

2. When working on any conductor in a multiple conductor trench, all conductors shall all be identified, isolated, tested and grounded.

3. Grounds may be temporarily removed during testing. During the test procedure each employee shall use insulating equipment, shall isolate each employee from any hazards involved and shall implement any additional measures necessary to protect employees in case the previously grounded lines and equipment become energized.

4. Caution: It is recommended in loop-fed circuits to jumper out the concentric neutral on all conductors prior to cutting the conductors and concentric neutrals as it is possible to have currents flowing through the neutrals of de-energized cables.

704 Mechanical Equipment (Derrick Trucks, Cranes, Etc.)

1. With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the clearances set forth in Appendix A, unless:

    a. An insulated barrier is installed between the energized part and the mechanical equipment; or

    b. The mechanical equipment is grounded; or

    c. The mechanical equipment is insulated; or

    d. The mechanical equipment is considered as energized.

2. Equipment and machinery operating adjacent to energized lines or equipment shall comply with Rule 704-1.

3. Lifting equipment shall be bonded to an effective ground or it shall be considered energized and barricaded when utilized near energized equipment or lines.

705 Stringing or Removing Overhead Conductor

1. Prior to stringing operations, a briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.

2. When there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage, the conductor being installed or removed shall be grounded or provisions made to insulate or isolate the employee.

3. Equipment utilized by the reel tender shall be bonded to assure the same potential as the conductor being strung.

706 Mechanized Equipment

1. All mobile cranes and derricks shall be effectively barricaded or grounded when being moved or operated in close proximity to energized lines or equipment, or the equipment shall be considered energized.

SECTION 8 DISTRIBUTION AND TRANSMISSION

801 Working On or Near Exposed Energized Lines and Equipment

1. Only qualified employees may work on or within minimum approach distance (MAD) of exposed energized lines or parts of equipment. Only qualified employees may work in areas containing unguarded, uninsulated, energized lines or parts of equipment operating at 50 volts or more. When employees are performing work on or associated with exposed lines or equipment energized at 50 volts or more, persons trained in first aid and cardiopulmonary resuscitation (CPR) shall be available as follows:

    a. For field work involving more than two employees at a work location, at least two persons trained in CPR shall be available. However, only one trained person needs to be available if all new employees are trained in First Aid and CPR within three months of their hiring dates.

2. Only qualified journeymen may work on or with exposed energized lines or parts of equipment. Only qualified journeyman may work in areas containing unguarded, uninsulated, energized lines or parts of equipment operating at 50 volts or more. When two or more employees are working on the same line section, they shall only work on or contact the same conductor at one time.

    Note: An employee undergoing on-the-job training (i.e. apprentice) who has demonstrated the ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.

3. Employees may not work on equipment or lines in any position from which a shock or slip will tend to bring the body toward exposed parts at a potential different from the employee's body.

4. In connecting de-energized equipment or lines to an energized circuit by means of a conducting wire or device, employees shall first attach the wire to the de-energized part. When disconnecting, employees shall remove the source end first. Loose conductors shall be kept away from exposed energized parts.

5. When work is performed in the vicinity of exposed energized parts of equipment, employees shall remove or render nonconductive all exposed conductive articles, such as key or watch chains, rings, or wristwatches or bands.

6. Employees must evaluate existing conditions that relate to the safety of the work to be performed before work is started. Before starting to work, preliminary inspection or test shall be made to determine what conditions exist. Care shall be exercised to avoid coming in series with an open neutral.

7. Secondary windings of current or series transformers shall be shunted before any instrument, or other device connected in the circuit, is removed or disconnected.

8. Workers shall not stand on or otherwise be in contact with transformer cases or other similar equipment while working on energized wires or equipment.

9. When workers are working on or near energized lines or equipment, there shall be no more talking than is needed for the proper handling of the work.

802 Night Work

1. When journeymen are sent out at night to perform repair work which may require working on energized primary equipment or climbing off the ground, not less than two (2) journeymen shall be required. When patrolling line at night, two journeymen, or one journeyman and a worker shall be the accepted work practice, unless another worker is unavailable.

2. During inclement weather conditions, there must be not less than two (2) workers on all night call-outs or job assignments, and journeymen performing work at night may call out another worker to assist them when, in their opinion, it is advisable to do so, provided the Line

Superintendent, Operations Manager, or Tech-on-Call cannot be contacted.

803 Two Person Rules

High Voltage: Not less than two journeymen, or workers with equivalent training and experience, shall be required to work on energized high voltage equipment. A qualified apprentice may work in place of one of the journeymen for the purpose of training.

1. Two journeymen shall work together on the same pole or structure when working energized circuits in excess of 600 volts between phases. Two separate poles or structures shall be considered as one for the purpose of this rule if both workers can step to the other pole or structure without having to descend to the ground to do so.

2. Exceptions: The following exceptions to the two worker rule apply:

    a. When re-fusing circuits with a live-line tool.

    b. When operating switches by means of operating handles or live-line tools, excluding installation or removal of load break elbows with live line tools, addressed in the following paragraph 2c:

    c. Routine circuit switching, including installation or removal of a load break elbow with a live line tool on a single phase line or apparatus, with only one potential primary source. Authorized employees must conduct an inspection to determine that conditions on the site allow for safe work.

    d. When a qualified apprentice is assigned to work with a journeyman for the purpose of training.

    e. Where life or the public's safety is in immediate danger, one worker may remove only the immediate hazard if no other workers are immediately available.

f. When installing or removing a hot line clamp connection with an approved hot stick on single phase line or apparatus, providing that the connection or disconnection does not interrupt or pick up a load.

NOTE: An apprentice lineman in his 4th period of training may be permitted to perform limited work on lines or equipment energized at more than 600volts, provided that such work is done under the immediate supervision of a journeyman lineman.

Each apprentice shall work under the supervision of a journeyman. An apprentice lineman who has been approved for hot line training will not be permitted to work within reach of conductors that are energized in excess of 600 volts between phases unless the crew with which s/he is working has at least two journeymen linemen.

804 Safety Watcher

A qualified safety watcher shall be provided whenever workers or equipment are required to perform work in areas where inadvertent motions, movements or tool use would violate specified clearances. The safety watcher's sole duty is to keep constant watch over persons under their observation, to warn them of danger, and to stop the work when necessary.

The foreman may act as the safety watcher providing his/her other duties do not interfere. Should the foreman, for any reason, find his/her attention distracted or leave the immediate vicinity, s/he shall either designate another qualified person as the safety watcher or order the work stopped.

The foreman or worker in charge of the work will be held responsible for the designation of the safety watcher. It is the foreman's responsibility to select a qualified worker for this job who is capable, and who is familiar with the work being done.

Any worker may ask for a safety watcher when one is required by this code.

A safety watcher shall be provided whenever a clearance is necessary for the performance of non-electric work. Safety watchers shall obtain such clearances and see that necessary grounds are installed.

While working in an energized substation, the use of vehicles, gin poles, cranes, and other equipment in restricted or hazardous areas shall at all times be controlled by a safety watcher other than the equipment operator.

A qualified safety watcher shall be provided for all other work being performed in any energized substation yard except when the work area is separated from all energized equipment by a suitable and adequate barrier.

A foreman shall not work as a journeyman while supervising two or more other journeymen who are engaged in high voltage or equally hazardous work.

When a line foreman's crew consists of not more than two (2) journeymen other than her/him and two (2) helpers, he may perform work to the extent that it does not interfere with the supervision of the crew. Where the foreman's journeymen are engaged in work on primary energized circuits or in the energized area, or equally hazardous work, the foreman shall devote full time to supervision.

805 Wire Ropes and Metallic Hoisting Lines

Conductive rigging (wire rope) shall not be used to raise poles, transformers and other equipment except when such rigging is below, protected, or at a sufficient distance from energized high voltage conductors to prevent hazardous contact.

806 Electrical Protective Equipment (Line Hose, Barricades, Etc.)

1. Employees shall not touch or work on any exposed parts energized at 50 volts or more or bring apparatus within minimum approach distances except when wearing protective equipment approved for the voltages less than 5000 volts.

2. The employer shall ensure that each employee, to the extent that other safety-related conditions at the work site permit, works in a position from which a slip or shock will not bring the employee's body into contact with exposed, un-insulated parts energized at a potential different from the employee.

3. When applying electrical protective equipment, it is recommended that the protective equipment extend beyond the reach of the employee's anticipated work position or extended reach distance.

4. Insulating blankets shall not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat.

5. When not in use, electrical protective equipment shall be protected from mechanical and chemical damage and shall always be stored in the containers provided and nothing else placed therein.

6. Line hose, hoods, blankets, line guards, barricades, etc., shall be visually inspected before each job, before each days use, and immediately following any incident that can reasonably be expected of having caused damage.

7. Bare communications conductors shall be treated as energized lines and shall be protected accordingly.

8. Electrical protective equipment shall be given periodic testing. Reference: OSHA 1910.269.

9. Electrical protective equipment shall be inspected for damage before each days use and immediately following any incident that can reasonably be suspected of having caused damage.

807 Climbing and Working on Poles

1. All poles and structures shall be carefully inspected before climbing to assure that they are in a safe condition for the work to be performed and that they are capable of sustaining the additional or unbalanced stresses to which they will be subjected. The types of abnormalities that should be checked are general condition, cracks, holes, shell rot and decay, knots, depth of setting, soil conditions, and burn marks.

Acceptable tests for poles are hammer tests, rocking tests, or increment bore tests.

2. Wires shall not be attached to or removed from a pole or structure until it is certain the pole or structure will withstand the altered strain.

3. Poles, except new poles, shall be thoroughly tested before they are climbed. If a pole is not strong enough to sustain a lineman's weight by reason of its condition or its placement (such as in soft ground), it shall be guyed or otherwise secured throughout the time any work is being performed on it. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole may be lashed to the new one in lieu of guying. (CFR 1910.269(q)).

4. Workers shall not wear their climbers while driving or riding in vehicles or when working on the ground, on ladders (except hook ladders), or on platforms in which the wearing of the climbers creates a hazard.

5. Gaffs on climbers shall be kept within safe length limits (1-1/4 inches minimum), properly shaped, and sharp per manufacturers recommendation).

6. Employees shall not work on an elevated pole or structure without first securing themselves with an approved fall arrest system.

7. Only approved fall arrest systems, work positioning equipment, and tool belts, shall be used.

8. Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belt or harness. Leather or other non-conducting material shall be used for this purpose.

   Each qualified employee climbing or changing location on poles, towers, or similar structures need to use fall protection equipment unless the employer can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.

9. It is recommended that when two or more employees are to work on the same pole at the same time, each shall reach the working position before the next leaves the ground. They shall descend the pole one at a time.

10. When climbers are not in use they shall be guarded or placed where the sharp points will not damage other equipment or cause personal injury.

808 Working on Energized Lines with Live-Line Tools

1. It is recommended that work with live-line tools shall not be started during unfavorable weather such as thunderstorms in the immediate vicinity, snow storms, rain, ice, etc.

2. It is recommended that a hotline hold be established before work with live-line maintenance tools begins.

3. It is recommended that a careful check is be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators, and other equipment.

4. It is recommended that while live-line work is in progress, no other work of any nature be performed on the same pole or structure.

5. In no case shall more than one energized conductor or phase be contacted at one time for any purpose other than phasing and voltage check with approved hotsticks.

6. It is recommended that all live-line tools, when not in use, be kept in protective bags or waterproof boxes provided for that purpose and such containers shall be stored in a dry and, if possible, warm place.

7. Live-line tools shall not be laid directly on the ground or against sharp objects such as barbed wire fences. Tool holders or tarpaulins shall be used for this purpose.

8. All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean and if any hazardous defects are indicated such tools shall be removed from service.

9. Live-line tools used for primary employee protection shall be removed from service every two years for testing, or when the dielectric integrity of the tool is suspect. (Reference 29 CFR 1910.269(j)(2)(iii)).

10. Link sticks shall be used with ropes on all energized conductors.

809 Reenergizing Open Circuits

1. All lines on a faulted circuit will be visually inspected up to the next point of isolation prior to reenergization.

810 Working on Transformers

1. The primary leads and bushings of a distribution transformer shall be considered energized at full voltage until both the primary and secondary leads have been disconnected or it has been definitely determined that the secondary circuit to which it is attached is grounded.

2. The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are properly grounded.

3. When working on de-energized transformers normally energized above 600 volts, the fuses and taps should be removed from the line. If the transformer to be worked on is in parallel with another transformer the secondary leads shall be removed and isolated.

811 Hoisting Cables – Conductive Material

1. Wire rope or other conductive material shall not be used to raise transformers, poles, or any other material near high-voltage lines, unless energized conductors are properly covered.

2. It is recommended that metallic slings and hoists (chain or cable) shall not be used within the minimum approach distance of energized equipment.

3. Synthetic hoisting and pulling lines and ropes shall not be considered as insulated.

812 Working on Capacitors

1. Capacitors shall be considered to be at full voltage potential until they have been removed from the line, the terminals short-circuited and discharged to ground by an approved method. The terminals shall not be short-circuited until the capacitors have been de-

energized for at least 5 minutes.

2. Employees shall use an approved hot stick while shorting and grounding terminals.

3. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.

4. The terminals of all capacitors in storage shall be shorted.

813 Voltage Regulators

Only qualified employees shall be assigned to work on voltage regulators.

Employees shall be familiar with and follow the instruction manual while working on voltage regulators.

When a regulator is to be placed in or out of service, it shall be placed in the neutral position, switched to off. The bypass switch then may be opened. It is recommended that the neutral position be verified by testing with an approved test device.

814 Stringing or Removing De-energized Conductors

Positive Control: Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tie-lines, or other means to prevent accidental contact with energized circuits.

Removing Conductors: Conductors shall be strung or removed with a dry, nonconductive rope used as a running or trailing line. In replacing a conductor with a new or larger conductor, the conductor being removed shall not be used to pull in the new conductor unless the conductor being removed has been carefully inspected for its entire length and then found to have adequate strength.

Pulling: Each pull shall be snubbed or dead ended at both ends before subsequent pulls.

Bare Conductors: Bare conductors being strung or

removed shall be run through an effectively grounded block or be grounded at the reel or the first possible point where the conductor could contact energized high voltage conductors.

Stringing Conductors: Conductors being strung shall not be allowed to slack enough to be in reach of traffic or pedestrians, unless guarded by flaggers or other suitable safeguards.

Sleeves: When stringing or removing conductors under tension, there shall be no sleeves pulled through the bull wheel or the puller on the tension machine.

Reel Tender: A lineman or experienced person under the supervision of a lineman shall be placed in charge of the reels as the reel tender.

Reel Tending Equipment: Reels shall be grounded. Reel tenders shall be provided with and use a suitable insulated platform or rubber mat on which to stand, and shall wear rubber gloves.

Equipment Secured: Reel handling equipment, including pulling, braking and sagging equipment shall be firmly anchored or secured during operations.

1. When stringing or removing de-energized conductors, the provisions of paragraphs 2 through 12 of this section shall be complied with.

2. Prior to stringing operations, a briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required.

3. Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup, to further protect the employee from the hazards of the conductor, the conductor being installed or removed shall be grounded or provisions made to insulate or isolate the employee.

4. (i) If the existing line is de-energized, proper clearance authorization shall be secured and the line grounded on both sides of the crossover; or the line being strung or removed shall be considered and worked as energized.

(ii) When crossing over energized conductors in excess of 600 volts, rope nets or guard structures shall be installed unless provision is made to isolate or insulate the worker or the energized conductor. Where practical the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded on either side of the crossover or considered and worked as energized.

5. Conductors being strung in, or removed, shall be kept under positive control by the use of adequate tension reels, guard structures, tie-lines, or other means to prevent accidental contact with energized circuits.

6. Guard structure members shall be sound, of adequate dimension and strength, and adequately supported.

7. (i) Catch-off anchors, rigging, and hoists shall be of ample capacity to prevent loss of the lines.

   (ii) The manufacturer's load rating shall not be exceeded for stringing lines, pulling lines, sock connections, and all load-bearing hardware and accessories.

   (iii) Pulling lines and accessories shall be inspected regularly and replaced or repaired when damaged or when dependability is doubtful. The provisions of §1926.251(c)(4)(ii) (concerning splices) shall not apply.

8. Conductor grips shall not be used on wire rope unless designed for this application.

9. While the conductor or pulling line is being pulled (in motion) employees shall not be permitted directly under overhead operations, nor shall any employee be permitted on the crossarm.

10. A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in, except on dead end structures.

11. (i) Except during emergency restoration procedures, work from structures shall be discontinued when

adverse weather (such as high wind or ice on structures) makes the work hazardous.

(ii) Stringing and clipping operations shall be discontinued during the progress of an electrical storm in the immediate vicinity.

12. (i) Reel handling equipment, including pulling and braking machines, shall have ample capacity, operate smoothly, and be leveled and aligned in accordance with the manufacturer's operating instructions.

(ii) Reliable communications between the reel tender and pulling rig operator shall be provided.

(iii) Each pull shall be snubbed or dead ended at both ends before subsequent pulls.

815 Stringing Adjacent to Energized Lines

1. Prior to stringing parallel to an existing energized transmission line a competent determination shall be made to ascertain whether dangerous induced voltage buildups will occur, particularly during switching and ground fault conditions. When there is a possibility that such dangerous induced voltage may exist the employer shall comply with the provisions of paragraphs (d)(2) through (9) of this section in addition to the provisions of paragraph (c) of this §1926.955, unless the line is worked as energized.

2. When stringing adjacent to energized lines the tension stringing method or other pulled and any employee shall be used.

3. All pulling and tensioning equipment shall be isolated, insulated, or effectively grounded.

4. A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor, subconductor, and overhead ground conductor during stringing operations.

5. During stringing operations, each bare conductor, subconductor, and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup and in increments so that no point is more than 2 miles from a ground.

a. The grounds shall be left in place until conductor installation is completed.

b. Such grounds shall be removed as the last phase of aerial cleanup.

c. Except for moving type grounds, the grounds shall be placed and removed with a hot stick.

6. Conductors, subconductors, and overhead ground conductors shall be grounded at all dead-end or catch-off points.

7. A ground shall be located at each side and within 10 feet of working areas where conductors, subconductors, or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other. It is recommended that splicing be carried out on either an insulated platform or on a conductive metallic grounding mat bonded to both grounds. When a grounding mat is used, it is recommended that the grounding mat be roped off and an insulated walkway provided for access to the mat.

8. All conductors, subconductors, and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

Work on dead-end towers shall require grounding on all de-energized lines.

Grounds may be removed as soon as the work is completed: provided that the line is not left open circuited at the isolated tower at which work is being completed.

9. When performing work from the structures, clipping crews and all others working on conductors, subconductors, or overhead ground conductors shall be protected by individual grounds installed at every work location.

816 Setting and Removing Poles

1. If any holes are left unattended or unfilled at the end of the work period, they shall be protected.

2. All persons not engaged in pole setting operations shall keep out of the work area.

3. It is recommended that while setting or removing poles between or near energized conductors observe the following:

    a. If safe clearance cannot be maintained, the conductors shall be de-energized or covered by protective devices and spread, or pole guards shall be used to minimize accidental contact.

    b. Workers handling the butt of the pole shall wear rubber gloves whether or not cant hooks, peaveys, or slings are used.

    c. Until a pole is positively secured from moving against an energized conductor, no one will step on or off the truck or touch any part of it without using rubber gloves if employee is standing on the ground.

    d. Ground wires shall not be attached on the pole higher than 10 feet from the ground.

4. It is recommended that when pikes are used to hold poles in place while holes are being backfilled, the pikes be firmly grounded in all directions and shall not be removed until the backfill is sufficient to hold the pole. When a pole is being "canted" or "hooked", the pikes shall be held.

5. Employees shall not stand or pass under a suspended load or adjacent to or over or under a loaded winch line.

6. Employees engaged in handling or working on poles shall wear suitable gloves.

7. Only those employees who are trained and qualified shall operate the hoisting equipment.

8. The hoist equipment load limits as specified by the manufacturer shall not be exceeded under any circumstance.

9. Hoisting equipment shall have a load capacity chart and boom-angle indicator in view of the operator. See pole weight charts Table A2 – A 4 in Appendix A.

10. It is recommended when removing set poles; extreme caution shall be exercised to assure the hoisting equipment is not overloaded due to the weight of the pole, its adhesion to the ground, and shock load. The use of pole jacks, tension load meters (dynamometer), a hoist device with sufficient lifting capacity, and/or loosening the earth around the pole along its entire depth shall be considered.

11. Hoisting equipment operators shall accept signals only from the employee specifically designated. The operator shall obey the stop signal given by anyone. For additional information refer to Table A5 in Appendix A on hand signals.

12. When poles are set, moved, or removed near exposed energized overhead conductors, the pole may not contact the conductors, unless proper protection equipment is in place.

13. Lifting equipment shall be bonded to an effective ground or it shall be considered as energized and barricaded when used near energized lines or equipment.

14. Employees working on the ground shall avoid contact with equipment or machinery working adjacent to energized lines or equipment unless; they have suitable protective equipment for the voltage involved.

817 Fuses, Cutouts and Switches

1. When fuses must be installed or removed with one or both terminals energized with exposed parts energized at more than 50 volts, tools or gloves rated for the voltage shall be used. When installing expulsion-type fuses, employees shall wear safety glasses or safety goggles and shall stand clear of the exhaust path of the fuse barrel.

2. Open cutouts and switches, except those with grounded metal bases, where the source and load leads are separated by porcelain or other man-made material shall not be considered as adequate clearances.

3. Open cutouts and switches, except a grounded metal base switch, shall be disconnected from the source when it is necessary for work to be performed on the load side

of the switch or cutout.

818 Rope (Synthetic Fiber)

1. A rope shall not be overloaded or dragged over rough or sharp objects.

2. Short bends over sharp-edged surfaces should be avoided.

3. Kinks shall be removed before any strain is put on a rope.

4. When not in use, rope shall be dried, stored properly, and kept free from mechanical damage and excessive heat and dryness.

5. Rope shall be examined regularly for cuts, worn spots, burns, and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.

6. The outward appearance of the rope shall not be accepted proof of quality of strength.

7. The safe loads shall not be exceeded. Splices have only 80 percent strength of rope. Knots have only 50 percent strength of rope.

8. Handlines shall be a minimum of ½ inch diameter.

9. Rope used for hot work shall be kept exclusive for hot work only.

Handlines

Measuring tapes or ropes or contain conductive strands shall not be used when working on or near energized parts.

Materials and tools other than belt tools:

(i) Shall be raised or lowered by means of a suitable container and/or hand line.

(ii) Shall not be thrown to, or from, linemen working on poles or structures.

819 Working in Energized Substations

1. Only those qualified persons authorized to enter a substation shall be permitted to do so.

2. Whenever work is performed in an energized substation, a qualified person observing shall be present except in the case of low-voltage work, routine inspections and switching or recording duties.

3. New employees and those not familiar with the hazardous conditions inherent in a substation shall be given special instructions (job briefing) before they are permitted to enter, and shall be accompanied by a qualified worker.

4. No parking shall be allowed within the substation unless required for work purposes.

5. Before driving a vehicle into a substation, the driver shall check the overhead clearance of the vehicle (e.g. radio antenna, boom, bucket) to prevent contact with low lines or other structures.

6. Except for fuse replacement or other necessary access by qualified persons, the guarding of energized parts within a compartment shall be maintained during operation and maintenance functions to prevent accidental contact with energized parts and to prevent tools or other equipment from being dropped on energized parts.

7. When drawn-out type circuit breakers are removed or inserted, the breaker shall be in the open position and the control circuit shall also be rendered inoperable if the design of the equipment permits.

8. When guards are removed from energized equipment, barriers shall be installed around the work area to prevent employees, who are not working on the equipment but are in the area, from contacting the exposed live parts.

9. No material or equipment shall be stored under an energized bus or line or near energized equipment.

10. When substation fences are expanded or a section is removed, grounding grids shall be maintained and

bonding shall be used to prevent electrical discontinuity. When a substation fence must be removed for construction purposes, a temporary fence affording comparable protection shall be erected. Such temporary fencing, when constructed of metal, shall be bonded to the existing fence. All substation gates shall be kept closed and locked except when work is in progress and access can be controlled by direct line of sight.

11. Sufficient access and working space shall be provided and maintained around electric equipment to permit ready and safe operation and maintenance of such equipment.

12. Before entry into an energized substation, authorization shall be obtained from the designated, authorized person. In order to enter the energized substation each person shall have on the following PPE as a minimum; hard hat, safety glasses. Each employee exposed to hazards from electric arcs shall wear protective clothing and other protective equipment with an arc rating greater than or equal to the estimated heat energy.

13. A log book shall be kept at each station recording all of the following:

    a. all persons entering and leaving, including times for both, names of all entrants, and purpose of entry; and

    b. Operations of equipment with respect to transformers, switching equipment, transmission and distribution circuits shall be recorded.

14. A safety watcher shall be provided for all work and mobile equipment use except when the work area is separated from all energized lines and equipment by a suitable and adequate barrier.

820 Metering

1. Eye, face and hand protection shall be used when installing or removing meters from energized meter sockets and meter sockets equipped with bypass capabilities.

2. A check shall be made to ensure that all instrument panels and associated enclosures are properly grounded.

3. It is recommended that:

    a. Meter sockets be inspected before the meter is installed and/or the service is energized. A check should be made to ensure there is no socket damage, loose connections, or foreign objects present that could cause a short circuit or flashover.

    b. Voltage readings between the source, load, and ground will be made to prevent cross phasing, feedback, or phase-to-ground fault through the meter or meter socket.

    c. For voltage in excess in 250 volts, the service will be de-energized prior to installation or removal of the meter unless the meter base is a safety socket

    d. Before removing a meter, a visual inspection will be made to determine if the meter or meter socket is damaged. If damage is indicated, the meter should be de-energized before removal.

    e. During testing, the energized socket or test equipment should not be left unguarded. If a socket is to be left energized, a meter or approved socket cover should be in place before leaving the work area.

    f. Employees should push self-contained meters into their socket. Employees should never hit the meter with their hand or any other device.

4. Under no circumstances shall the secondary terminals of a current transformer be opened. The current transformer shall be shunted before the secondary metering circuit is opened.

5. Whenever possible, employees shall turn off the customer main switch prior to installing and removing self-contained meters. Heavily loaded meters shall be

disconnected from load before removal. Proper personal protective equipment (PPE) shall be worn.

821 Testing and Test Facilities

This section applies to testing involving interim measurements utilizing high voltage (1000 volts or more), high power, or combinations of both.

1. Employees shall be trained in safe work practices upon their initial assignment to the test area.

2. Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.

3. In field testing, or at a temporary site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:

    a. The test area shall be guarded by the use of distinctively colored safety tape that is supported waist high and to which safety signs are attached;

    b. The test area shall be guarded by a barrier or barricade that limits access to the area; or

    c. The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored.

4. Barriers shall be removed when the protection they provide is no longer needed.

5. Guarding shall be provided within the test areas to control access to test equipment or to apparatus that may become energized as part of the testing.

6. All conductive parts accessible to the test operator during the time the equipment is operating at high voltage shall be maintained at ground potential except for portions of the equipment that are isolated from the test operator by guarding.

7. When ungrounded terminals of test equipment or apparatus may be present, they shall be treated as

energized until determined by tests to be de-energized.

8. Visible grounds shall be applied, either automatically or manually with proper insulating tools, to the high voltage circuits after they are de-energized and before work is performed on the circuit or item or apparatus under test. Common ground connections shall be solidly connected to the test equipment and the apparatus under test.

9. If a test trailer or test vehicle is used in field testing, its chassis shall be grounded. Protection against hazardous touch potentials with respect to the vehicle, instrument panels and other conductive parts accessible to employees shall be provided by bonding, insulation, or isolation.

10. Safety practices governing employee work at temporary or field test areas shall provide for a routine check of the test areas for safety at the beginning of each series of tests.

11. The test operator in charge shall conduct these routine safety checks before each series of tests and shall verify at least the following conditions:

    a. Barriers and guards are in workable condition and are properly placed to isolate hazards;

    b. System test status signals, if used, are operable;

    c. Test power disconnects are clearly marked and readily available in an emergency;

    d. Ground connections are clearly identifiable;

    e. Personal protective equipment is provided and used as required; and

    f. Signal, ground, and power cables are properly separated.

SECTION 9 TREE TRIMMING

901 General

1. Climbers with pole gaffs shall not be used in trees.

2. Climbing ropes shall be used by employees working aloft in trees. These ropes shall have a minimum diameter of 0.5 inch with a minimum breaking strength of 2300 pounds. Synthetic ropes shall have elasticity of not more than 7 percent.

3. Each employee shall be tied in with a climbing rope and safety saddle when the employee is working above the ground in a tree, unless he is ascending into the tree.

4. It is recommended that:

    a. Dead or rotted limbs, regardless of size, should not be used by employees for support;

    b. No work should be done in a tree until the employee is securely tied in or belted to the tree;

    c. The climbing rope should be crotched in such a manner as to prevent its "working out" on a lateral limb;

    d. When working in a multiple trunk tree, the climbing rope should preferably be crotched around a main trunk other than the one on which the employee is working;

    e. Employee should crotch his climbing rope in two places if a single crotch does not adequately protect them from falling into energized lines or falling back into trunk of tree;

    f. The climbing rope should not be used as a pull rope or as a hand line to lower limbs or branches;

    g. The ground end of a climbing rope should not be allowed to dangle over roadways and should be kept free from obstructions, passing vehicles, etc.;

h. The taut-line hitch should not be released until the climber is on the ground;

i. Branches or other material should not be dropped unless the immediate area has been cleared so that there is no possibility of injury to persons or damage to property. If such a possibility exists, a rope should be used to lower branches or other materials;

j. When lowering heavy tree members, employees should not tie fall lines around hands or bodies;

k. Employees should not attempt to clear limbs or brush from under that side of tree where the climber is working;

l. Employees should obtain assistance or use power equipment, if available, when lifting logs or other heavy loads; and

m. When loading brush on a truck, employees should not stand on or straddle the loaded brush.

5. Only qualified persons shall be employed for trimming trees for high voltage line clearances.

6. Tree trimming shall be done under the supervision of a qualified person where there is a possibility of contact with high voltage lines or equipment.

7. At least two qualified tree trimmers shall work together when trimming trees which could contact high voltage lines or equipment. An apprentice may serve as one of the required tree trimmers. The second worker may remain on the ground.

8. A tree trimmer shall use a safety strap or life line when working in a tree. When working from an aerial lift a harness and lanyard shall be worn.

9. The snap used in the safety line for attaching to the "D" ring shall be of a self-locking safety type.

10. Life lines shall not be used to lower equipment or limbs of trees.

11. Tree trimmers shall not carry tools other than belt tools while climbing. Tools other than belt tools shall be raised and lowed by means of a line.

12. Any saw not normally carried and secured on a tool belt shall be provided with a strap or tie rope to prevent it from falling when not in use.

13. When using portable ladders to climb trees, the ladder shall be tied to the tree or supported by another worker. When working from a ladder during cutting operations, the ladder shall be securely tied or braced.

902 Working near Energized Conductors/Non-Qualified Employees

These instructions below do not apply to electric power generation, transmission, and distribution qualified employees.

1. Before any employee climbs, enters, or works around any tree, a close inspection shall be made to determine whether an electric conductor passes within 10 feet of the tree.

2. Wires in proximity to tree trimming shall be considered as energized, unless proven to be dead and are grounded.

3. All employees involved with tree trimming, other than line clearance tree trimmers, shall maintain the following minimum clearances from energized conductors and equipment (numbers expressed are phase to ground):

a. For lines and equipment energized at 50 kV or less, the minimum clearance distance is 10 feet.

b. For lines and equipment energized at more than 50 kV, the minimum clearance distance is 10 feet plus 4 inches for every 10 kV over 50 kV.

4. Only line clearance tree trimmers shall perform tree trimming if an electrical hazard exists or if parts of the trees are within 10 feet of exposed energized overhead conductors or equipment.

5. A second line clearance tree trimmer shall be within normal voice communication and have climbing gear

within 50 feet of the work area if any of the following conditions exist:

a. If a line clearance tree trimmer is to approach closer than 10 feet to any conductor or electrical apparatus energized at more than 750 volts;

b. If branches or limbs being removed are closer to lines energized at more than 600 volts are within the distances listed in A15 in Appendix A; or

c. If roping is necessary to remove branches or limbs from energized conductors or apparatus more than 600 volts.

6. Line clearance tree trimmers shall maintain clearances from energized conductors as shown in CFR 1910.269, Table R-6, Table R-9, and Table R-10.

7. Line clearance tree trimmers shall use insulating equipment when removing branches that are contacting exposed energized conductors or equipment, or that are within the distances or have the potential to come within the distances specified in Table A15. Limbs being removed from contact with wires are to be handled with the same precautions as the wires themselves. Care shall be taken to prevent limbs being removed from coming in contact with tree trimmer's body.

8. Ladders, platforms, aerial lifts, tools, and equipment shall not be brought closer to an energized conductor or apparatus than the distances listed in CFR 1910.269, Table R-6, Table R-9, and Table R-10.

9. Tree trimming and tree felling work should terminate and employees should be moved to a place of safety during electrical storms and periods of high winds or other unusual weather conditions that are dangerous to employees.

10. Employees shall not remove tree limbs or branches above energized conductors while other employees are working below the conductors in the same span.

11. Broken or fallen wires shall not be handled except by qualified persons.

12. When working near wires, the employee shall have their climbing rope so secured that in the event they slip or a

limb breaks, they will swing free and clear of the wires.

13. Tree limbs shall not be dropped on conductors.

14. Ropes shall not be thrown over conductors or crossarms for the purpose of using the conductor or crossarm as a support or hitch.

15. Dry ropes shall be used in trees through which energized conductors pass.

903 Tree Felling

It is recommended that:

1. The employee felling the tree plan a clear retreat path before a cut is started.

2. The feller appraise the situation for dead limbs, the lean of the tree to be cut, wind conditions, and other hazards and exercise proper precautions before the cut is started.

3. When felling a tree, an undercut is to be made about 1/3 the diameter of the tree to guide the tree in the direction to fall and reduce the possibility of splitting. A back or felling cut should be made parallel to the inner edge of the undercut and approximately 2 inches higher than the undercut.

4. The feller shall shut off his saw before he starts his retreat.

5. On terrain where trees are likely to slide or roll, fellers should fell trees from the uphill side.

6. No one will be allowed to work in a tree located near a tree that is being felled if there is any danger of its being struck by any part of the falling tree. The recommended distance between workers is twice the height of the trees being felled.

7. All persons not engaged in the felling operation will be kept clear of guide ropes and other rigging.

8. Clear warning should be given to all employees in the area when trees are to be felled or heavy tree members are to be dropped. Once the felling of a tree has been started, it should be completed before leaving the job.

904 Care and Use of Tools and Rope

1. Ropes shall be inspected at least daily and before each use. Damaged sections shall be cut out and destroyed or the rope replaced. Note shall be taken that splices lower rope strength.

2. Ropes shall be kept away from fire, acids, oil, chemicals, and all sources of excessive heat or moisture.

3. Ropes shall be stored separately from sharp-edged cutting tools.

4. It is recommended that tools not be thrown into or dropped from a tree; they should be raised or lowered by a suitable rope line.

5. Ropes should be coiled and piled, or suspended so that air can circulate through the coils.

6. Rope ends shall be secured to prevent unraveling.

7. Climbing rope may not be spliced.

8. A rope that has compromised insulation (for instance, wet or contaminated) shall not be used near exposed energized lines.

905 Powered Trimming Equipment

1. Employees operating powered trimming equipment shall wear suitable eye and face protection and chaps (unless operating out of a bucket).

2. Hearing protection shall be worn while operating a chainsaw.

3. Chainsaw operators shall inspect the saw before each use to assure that all handles and guards are in place and tight, that all controls function properly, and that the muffler is operational.

4. Chainsaw operators shall follow manufacturer's instructions on operation and maintenance.

5. Power saws weighing more than 15 pounds that are used in trees shall be supported by a separate line, unless the work is performed from an aerial lift or no supporting limbs are available.

6. A chain saw shall be started on the ground or where it is otherwise firmly supported.

7. The operator shall grip the chainsaw with both hands during the entire cutting operation.

8. Chainsaw operators shall be certain of footing and clear away brush that might interfere.

9. All chainsaws shall be equipped with a control that will return to idling speed when released and properly operating chain brakes.

10. The chainsaw engine or motor shall be stopped for the following:

    a. When working on any part of the chain or cutting bar.

    b. While the saw is being moved from one location to another, including being carried up into the tree.

    c. While unit is unattended.

    d. While refueling.

11. A gasoline driven chainsaw shall not be used above shoulder level or at a distance that would require the operator to relinquish a safe grip on the saw.

12. Employees shall not approach chainsaw operator within the reach of the saw while the saw is in operation.

13. When backpack power units are used the following precautions shall apply:

    a. No one except the operator shall be within 10 feet of the cutting head of a brush saw.

    b. The backpack power unit shall be equipped with a quick shut-off switch readily accessible to the operator.

    c. Backpack power unit engines shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor except when the manufacturer's service procedure requires otherwise.

906 Chippers

1. Access panels for maintenance and adjustment of the chipper blades and associated drive train shall be in place and secure during operation.

2. Employees shall not permit spectators to stand near machine while feeding brush into chipper.

3. Safety glasses and face shield shall be worn by employees when feeding brush into chipper.

4. Employees shall never place hands or any other part of the body into brush hopper while chipper is in operation.

5. For hearing protection requirements, refer to Section 306.

6. It is recommended that only wrist length (non-gauntlet) gloves be used by employees feeding a chipper.

7. Trailer chippers detached from trucks shall have their wheels chocked or otherwise secured.

8. Brush chippers shall be equipped with a locking device in the ignition system.

9. It is recommended that brush chippers be equipped with emergency shut-off system.

907 Right-of-Way Clearing and Maintenance

1. Under no circumstances shall anyone but the operator ride on a bulldozer, or any other heavy equipment used in land clearing.

2. Bulldozer operators shall wear seat belts.

3. It is recommended that when two or more employees are cutting brush, they should be separated by at least 10 feet when utilizing backpack power units.

908 Use of Herbicides and Other Chemicals

1. Before using any herbicide or other chemical, employees shall read the label carefully and follow the directions and precautions listed. Refer to Section 401, Hazardous Materials, for additional information.

2. Where applicable, all employees who apply pesticides or herbicides shall be licensed or work under the direct supervision of a licensed operator.

3. All employees using pesticides or herbicides shall be properly trained.

SECTION 10 UNDERGROUND LINES AND EQUIPMENT

1001 Opening and Guarding Holes

Whenever a cover is to be removed from a manhole or a vault or any other obstruction to traffic exists, the following precautions shall be taken:

1. All obstructions to traffic shall be guarded by adequate signs, barricades, lights, flares, flags, etc.; traffic shall be warned in sufficient time that an obstruction exists through the use of signs, high-level standards, flashing lights, traffic cones, flagmen, etc., as may be needed.

2. It is recommended where permissible and practicable, the truck should also be placed to guard the work area against oncoming traffic. Such vehicle shall be turned off or vented away from work area.

3. A blow torch or other open flame should never be used to melt ice around a manhole or vault cover.

4. Manhole, vault, and service box covers should always be removed and replaced by means of approved hooks, hoists, or devices.

1002 Entering Underground Structures

Refer to Section 402, Confined or Enclosed Spaces, and 29 CFR 1910.269 (t).

1003 Working Around Energized Cables

1. No employee shall approach or take any conductive object without an insulated handle closer to exposed energized parts of lines or equipment than indicated in Table A13 of this manual unless the employee is insulated from the energized parts, the energized part is insulated from the employee and any other conductive object at a different potential, or the employee is insulated from any other conductive object.

2. When work is performed in the vicinity of exposed energized parts of equipment or lines, employees shall remove all exposed conductive articles, such as keys or watch chains, rings, wristwatches, or wrist bands.

3. All underground cables and apparatus carrying current at voltages greater than 600 volts shall be de-energized before work is done on the conductor with the following exceptions:

    a. URD cables which are properly insulated for the voltages to which they are energized shall be considered as an effective barrier to protect the employees from incidental contact;

    b. Workers will take adequate precautions to avoid physical contact with energized URD cable by using approved procedures and/or protective devices;

    c. When handling energized URD primary cables, the work shall be done with approved tools and/or procedures by two qualified employees except radial-fed single phase cable in good condition. Gang operated three phase switching is exempt from this rule;

    d. When energized terminators or load-break elbows are handled on V-phase or 3- phase conductor by a hot stick, there shall be two qualified employees at the scene;

    e. Rubber gloves shall be worn when working on or contacting an open neutral; and

    f. Two Journeymen performing testing for metering or power quality.

1004 Work on De-energized Cables

1. Employees shall, prior to cutting energized high voltage cables, identify, isolate, test, and ground, then cut using a hot line cutter(s) in conjunction with rubber gloves.

2. Before making an opening in or removing a part of the sheath or sleeve of a cable, the line shall be grounded at the first possible grounding point on each side of the work location. Use of equipotential mats is recommended.

1005 Pulling Cables

1. It is recommended that employees not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves, winch drums, and take-up reels.

2. It is recommended that pull-wires, steel pulling-lines, or metal rods not be pushed through ducts where energized equipment is present unless another employee is stationed at the other end of the run.

3. It is recommended that employees not remain in a manhole or vault during pulling operations involving heavy pulling strains unless they can take a position clear of the pulling-line.

4. Wire rope may be used to raise or lower equipment in a vault or manhole only when the energized conductors or equipment are adequately covered or protected.

1006 Opening and Closing Circuits

1. Switching procedures, including Hold Carding and tagging practices, shall be followed when sectionalizing URD systems.

2. It is required that an approved switching tool be used when switches, including secondary breakers and primary load-break elbows, in an energized circuit are opened or closed.

3. Any URD primary circuit shall be de-energized by opening one or more load-break devices. De-energizing shall be done with a load-break elbow connector, fuse cutout at the riser pole, load-break tool, or other approved load-break device.

4. Eye or face protection shall be worn when primary switching operations are performed.

1007 Work on Energized Equipment

1. When work is performed on energized cables or apparatus carrying less than 600 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances, and in using proper tools in order to prevent short circuits.

2. When energized pad-mounted transformers are unlocked and opened, they shall be directly attended by a qualified worker. They shall be kept closed and locked at all other times.

3. A primary or secondary system neutral on any energized circuit shall not be opened under any circumstances.

4. It is recommended that only one energized secondary or service conductor be worked on at any one time and protective devices be used to insulate or isolate it from all others.

1008 Excavation and Trenching

1. Employees shall not enter a trench or excavation deeper than 5 feet, without shoring unless the banks are reposed according to Tables A22 – A23 in Appendix A.

2. Trenches less than 5 feet shall also be shored or sides reposed if conditions indicate hazardous ground movement. Additional precaution by way of shoring and bracing shall be taken to prevent sides from caving in when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

3. Any time an employee is in a trench or excavation more than 4 feet deep, there shall be an access ladder in place no further than 25 feet away. The ladder shall extend above the ground line at least 3 feet.

4. In excavations where employees will be entering, pilings or materials shall be piled at least 2 feet back from the edge of the digging. If it is impossible to pile dirt two feet back from the edge, effective barriers shall be used.

SECTION 11 OFFICE SAFETY

1101 Office Safety

1. Employees shall report all injuries, strains, and sprains, regardless of severity, to the person in charge.

   a. A report shall be completed as soon as possible and given to the supervisor, department manager or Compliance Administrator.

   b. Every accident, whether or not an injury occurs, shall be reported immediately.

   c. Employees shall be trained in first aid, CPR and AED techniques to aid fellow employees. This includes treatment for shock and serious bleeding. They shall also be familiar with emergency numbers and the location of the first aid kits and AEDs.

   d. Report immediately any broken floor tiles, worn stair treads, missing or loose hand rails, or slippery surfaces.

   e. Employees shall also refer to the UEC emergency action plan.

2. Employees shall walk cautiously up and down stairs; the handrail shall be used whenever possible.

3. Caution shall be exercised when walking around blind corners.

4. Drawers of desks and file cabinets shall be kept closed when not in use.

5. Only one drawer of a file cabinet shall be pulled out at a time in order to avoid overbalancing, unless the cabinet is securely fastened to the wall or to other cabinets.

6. Do not sit on the edge of a chair. Do not tilt back when sitting in a straight chair.

7. Boxes, chairs, etc. shall not be used in place of ladders. Only ladders or step stools bearing the manufacturer's weight rating shall be used.

8. The floor shall be kept free of tripping hazards such as telephone cords, electric extension cords, and boxes.

9. Employees mopping or waxing floors shall place warning signs to alert co-workers and customers of the potential for slippery floors. All liquid spills shall be immediately cleaned up.

10. Material shall be stored on shelves in a manner to prevent falling; heavy objects shall be placed on lower shelves.

11. Hallways and aisles shall be kept clear of all obstructions.

12. All emergency exits and emergency equipment such as fire extinguishers and fire hose racks shall be kept clear of all obstructions.

13. Employees shall not use ventilation fans unless they are guarded or securely placed.

14. Solvents and other volatile or toxic substances shall be used only with adequate personal protection or in well-ventilated areas. Refer to Section 401, Hazardous Material.

15. Employees shall not attempt to clean, oil, or adjust any machine that is running. If the machine is not equipped with a starting switch that can be locked in the "off" position, it shall be disconnected from its power source.

16. Unsafe electrical cords, faulty electrical or other equipment, or any other hazardous condition shall be reported immediately.

17. Safety shall be considered in what employees wear on the job. Loose-fitting clothing, dangling bracelets, rings, and ties may cause serious injury to employees operating or working around power driven machines and shall not be worn.

18. Broken glass and other sharp objects shall not be placed in wastepaper containers.

19. Common or sharp-pointed pins shall not be used for fastening paper together. Staples, paper clips, or other approved fasteners shall be used.

1102 Video Display Terminals

1. Employees using video display terminals for extended periods of time shall consider the following:

    a. Keep back straight with feet resting firmly on the ground.

    b. Use a back-support cushion for lower back.

    c. Position video display terminal so the operator's eyes are level with the top of the screen.

    d. Position the video display terminal directly in front of the user and adjusted to avoid glare.

    e. Adjust the height of the chair or keyboard so that shoulder-elbow-arm angle is at 90 degrees.

    f. Use a cushioned wrist rest to keep user's hands and fingers in the same plane as the forearm.

2. Video display terminal users shall adjust position frequently to avoid muscle stiffness.

SECTION 12 FIRST AID

1201 First Aid Kits

Employees that are performing work on or associated with exposed lines or equipment energized at 50 volts or more shall be trained in First Aid and CPR.

1. First Aid supplies shall be readily available.

2. Each First Aid kit shall be readily available for use, and shall be inspected frequently enough to ensure that expended items are replaced in a timely manner. At a minimum, first aid kits should be inspected at least once per month and restocked as necessary.

1202 Pole Top Rescue

1. Pole Top rescue and Bucket Truck Rescue retraining is required annually.

2. The following is intended for a guide only:

    a. Assess the situation. The rescue effort will be far more effective if a few seconds are devoted to full identification of the situation.

    b. Radio for help and medical services. Prepare the equipment you will need.

    c. Protect yourself. Apply necessary protective equipment. Use necessary personal protective devices. Then clear the victim from the hazards.

    d. Position yourself for rescue.

    e. Proceed with rescue or resuscitation as dictated by the conditions.

        i. If the victim is conscious:

            a. Reassure the injured;
            b. Be watchful for shock;
            c. Help injured descend the pole; and
            d. Administer first aid.

ii. If the victim is unconscious and breathing:

a. Watch breathing closely;

b. Lower injured to ground; and

c. Give first aid.

iii. If the victim is unconscious and not breathing:

a. Lower the victim to the ground as soon as possible and initiate CPR.

f. Lowering the victim from the pole.

i. For field expediency, the following method is presented:

a. Place handline on crossarm, preferably 2 or 3 feet from pole;

b. Make one wrap of line. Do not cross load line over fall line;

c. Pass handline under armpits;

d. Tie three half hitches;

e. Cinch line tightly around victim;

f. Remove slack in line;

g. Cut victim's safety strap; and

h. Lower victim.

ii. Depending upon the situation, alternate hitching or lowering methods might be more desirable.

g. After rescue: Transport all victims to a doctor or hospital.

h. Training: All employees engaged in electrical work shall receive training in resuscitation and in rescue from their working environment annually. (Poles, structures, manholes, aerial buckets, confined or enclosed spaces, etc.)

i. Employees shall be trained with lower control override operations of aerial devices.

j. Training should include removal of the victim from the aerial bucket. Training should be specific to the type of aerial bucket used.

SECTION 13 TRAINING

1301 Employee Training

1. Employees shall be trained in and familiar with the safety related work practices, safety procedures, and other safety requirements in this section that pertains to their respective job assignments.

2. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures that are not specifically addressed in this section (such as pole-top rescue) but are related to their work and necessary for their safety. The degree of training shall be determined by the risk to the employee for the hazard involved.

1302 Qualified Employee Training

1. Qualified employees shall be trained and competent in the skills and technique necessary to distinguish exposed live parts from other parts of electrical equipment.

2. Qualified employees shall be trained and competent in the skills and techniques necessary to determine the nominal voltage of exposed live parts.

3. Qualified employees shall be trained and competent in the skills and techniques necessary to determine and maintain the minimum approach distances corresponding to the voltages to which they are exposed.

4. Qualified employees shall be trained and competent in the proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, 437-002-0138 Additional Oregon Rule for Electrical Protective Equipment and insulated tools for working on or near exposed energized parts of electrical equipment.

5. Training may be classroom or on-the-job.

6. Training shall establish employee proficiency in the work practices required.

1303 Safety Compliance

Regular supervision and inspections, conducted on at least an annual basis, will determine that each employee is complying with the safety-related work practices required.

1304 Additional Training and Retraining

1. The employer shall determine through regular supervision and through inspections conducted on at least an annual basis that each employee is complying with the safety-related work practices required.

2. All employees shall receive additional training (or retraining) under any of the following conditions:

    a. If the supervisor and annual inspections required by paragraph (1) of this section indicate that the employee is not complying with the safety-related work practices required;

    b. If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those which the employee would normally use;

    c. If she or he must employ safety-related work practices that are not normally used during his or her regular job duties. or

    d. If the employee requests additional training due to a lack of confidence or ability or his or her lack of retention of previous training material.

NOTE: OSHA would consider tasks that are performed less often than once per year to necessitate retraining before the performance of the work practices involved.

APPENDIX A
Tables & Charts

Table A1

EYE AND FACE PROTECTION SELECTION CHART

Source	Assessment of Hazard	Protection
IMPACT- Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles with side protection, goggles, face shields. See notes (1), (3), (5), (6), (10.) For severe exposure, use face shield.
HEAT- Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks	Face shields, goggles, spectacles with side protection. For severe exposure use face shield. See notes (1), (2), (3).
	Splash from molten metals	Face shields work over goggles. See notes (1), (2), (3).
	High temperature exposure	Screen face shields, reflective face shields. See notes (1), (2), (3).
CHEMICALS- Acid and chemicals handling, degreasing, plating.	Splash	Goggles-eyecup and cover types. For severe exposure, use face shield. See notes (3), (11).
	Irritating mists	Special-purpose gogges.
DUST- Woodworking, buffing, general dusty conditions.	Nuisance dust	Goggles- eye cup and cover types. See note (8).
LIGHT and/or RADIATION- Welding: Electric Arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes (9), (12).
Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note (9).
Cutting, Torch brazing, Torch soldering	Optical radiation	Spectacles or welding face shield. Typical shades, 1.5-3. See notes (3), (9).
Glare	Poor vision	Specatles with shaded or special purpose lenses, as suitable. See notes (9), (10).

Notes to eye and face protection section chart:

(1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.

(2) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.

(3) Face shields should only be worn over primary eye protection (spectacles or goggles).

(4) As required by the standard, filter lenses must meet the requirements for shade designations in 1910.133(a)(5). Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

(5) as required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.

(6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.

(7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.

(8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.

(9) Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).

(10) Non-sideshielded spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."

(11) Must provide adequate ventilation (indirect ventilation holes) and also protect the wearer from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation (indirect ventilation holes) and protects the wearer from splash entry.

(12) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows the task to be performed.

Table A2

POLE WEIGHTS—WESTERN RED CEDAR

Western Red Cedar Total CCA Treatment
Poles - Average Weights
(When Furnished to A.S.A. Specifications)

Length	Class											
(ft)	H6	H5	H4	H3	H2	H1	1	2	3	4	5	6
30							762	666	581	501	442	383
35							970	828	739	640	564	495
40			1,993	1,822	1,702	1,544	1,191	1,049	904	789	703	627
45			2,393	2,185	1,990	1,871	1,426	1,250	1,092	950	851	
50		1,906	2,939	2,508	2,149	2,145	1,686	1,478	1,284	1,119	987	
55		3,484	3,214	2,940	2,686	2,451	1,954	1,709	1,485	1,313		
60	4,237	3,920	3,604	3,306	3,029	2,752	2,231	1,944	1,693	1,518		
65	4,847	4,464	4,142	3,818	3,289	3,089	2,511	2,195	1,912	1,709		
70	5,359	4,966	4,597	4,227	3,880	3,557	2,828	2,455	2,152	1,934		
75	5,890	5,471	5,075	4,679	4,283	3,927	3,099	2,742	2,742			
80	6,626	6,003	5,544	5,121	4,726	4,198	3,785	3,184	3,033			
85	7,210	6,706	6,058	5,610	5,161	4,600	4,023	3,524	3,349			
90	7,840	7,306	6,593	6,118	5,643	5,019	4,419	3,880	3,726			
95	8,550	7,995	7,432	6,709	6,207	5,488	4,967	4,310	4,577			
100	9,141	8,547	7,922	7,194	6,435	6,105	4,940	5,214	5,029			
105	9,840	9,184	8,349	7,762	6,963	6,782	6,600	5,669	5,481			
110	10,563	9,874	8,966	8,349	7,514	7,343	7,184	6,174	5,933			
115	11,309	10,599	9,639	8,956	8,072	7,953	7,844	6,679				
120	12,078	11,326	10,296	9,546	8,672	8,547	8,164	7,227				
	Pounds											

Table A3

POLE WEIGHTS—CREOSOTED YELLOW PINE

Creosoted Yellow Pine
Poles - Average Weights
(When Furnished to A.S.A. Specifications)

Length	Class											
(ft)	H6	H5	H4	H3	H2	H1	1	2	3	4	5	6
30												
35					2,222	1,884						
40					2,585	2,222						
45					2,976	2,585						
50					3,454	2,976						
55					4,015	3,454						
60					4,620	4,015						
65					5,198	4,620						
70					5,863	5,198						
75					6,590	6,130						
80					7,458	6,600	5,863	4,730	3,883			
85					8,019	7,458	6,600	5,264	4,296			
90					8,762	8,019	7,458	5,869	4,730			
	Pounds											

Table A4

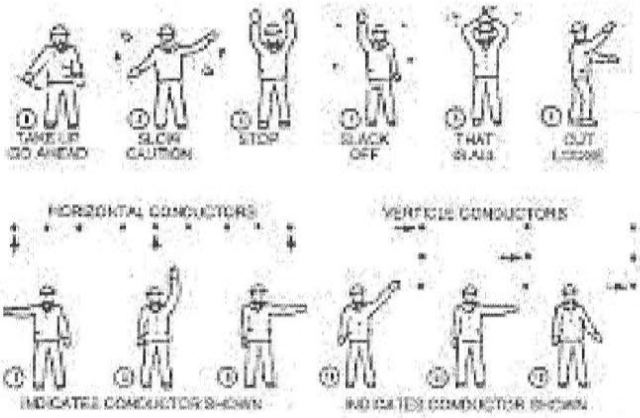
POLE WEIGHTS
DOUGLAS FIR PENTA TREATED

Douglas Fir Penta Treated
Poles - Average Weights
(When Furnished to A.S.A. Specifications)

Length (ft)	Class											
	H6	H5	H4	H3	H2	H1	1	2	3	4	5	6
30							1,065	890	765	635	520	410
35							1,210	1,065	930	805	695	605
40							1,545	1,310	1,165	1,025	895	770
45				3,034	2,635	2,280	1,930	1,660	1,410	1,235	1,075	930
50	4,395	3,995	3,625	3,490	3,000	2,573	2,225	1,920	1,625	1,420	1,245	
55	4,970	4,872	4,354	3,998	3,514	2,995	2,480	2,130	1,845	1,630		
60	6,190	5,570	5,021	4,564	4,109	3,601	2,845	2,480	2,155	1,845		
65	6,885	6,274	5,699	5,136	4,608	4,072	3,330	2,810	2,380			
70	7,725	7,056	6,374	5,765	5,136	4,574	3,860	3,245	2,635			
75	8,565	7,905	7,046	6,332	5,660	5,096	4,370	3,515	3,015			
80	9,395	8,659	7,785	6,953	6,230	5,530	4,980	4,045	3,525			
85	10,325	9,465	8,520	7,622	6,840	6,082	5,460	4,385	3,640			
90	11,295	10,445	9,394	8,486	7,476	6,658	6,035	4,965	4,050			
95	12,345	11,362	10,214	9,315	8,136	7,272	6,620	5,585				
100	13,325	12,254	11,069	9,821	8,789	7,853	7,205	6,545				
105	14,352	13,214	11,875	10,689	9,518	8,520	7,900	7,070				
110	15,418	14,433	12,978	11,669	10,320	9,273	8,555	7,670				
115	16,526	15,149	13,989	12,341	11,069	9,821	9,180	8,438				
120	17,565	16,109	14,588	13,347	11,731	10,443	9,990	9,032				
125		17,045	15,609	13,910	12,614	11,286	10,796					
	Pounds											

Table A5

HAND SIGNALS



Crane and Hoist Hand Signals

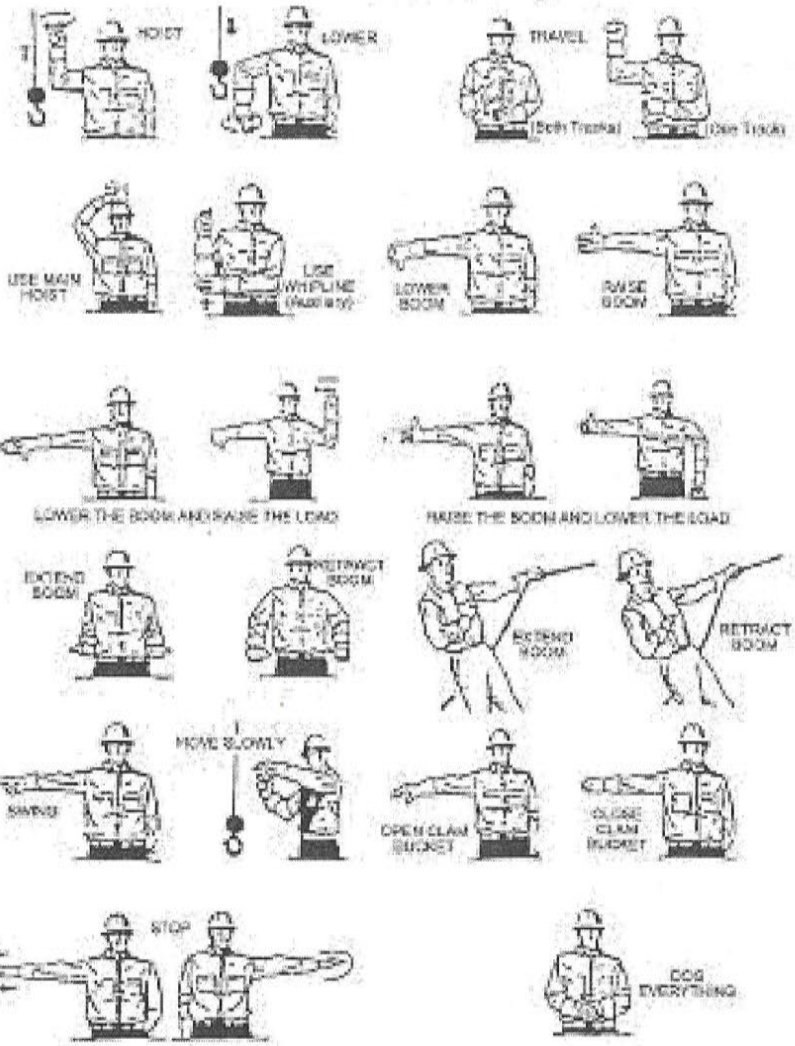
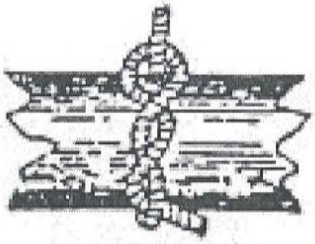
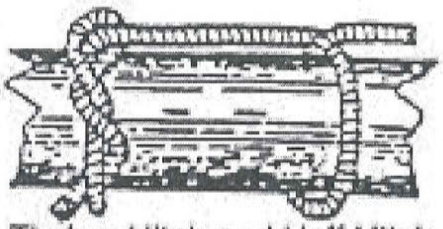


Table A6

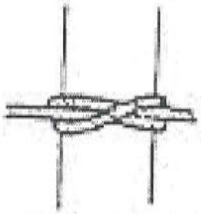
KNOTS



Timber Hitch

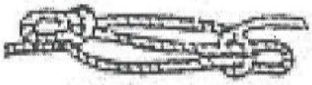


Timber Hitch and Half Hitch

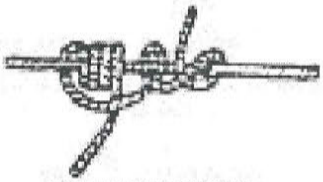


Clove Hitch

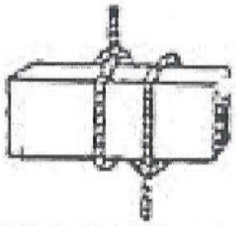
Square or
Reef Knot



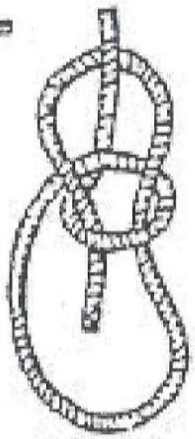
Sheepshank



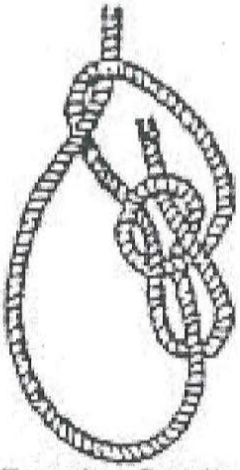
Stopper Hitch



Scaffold Hitch

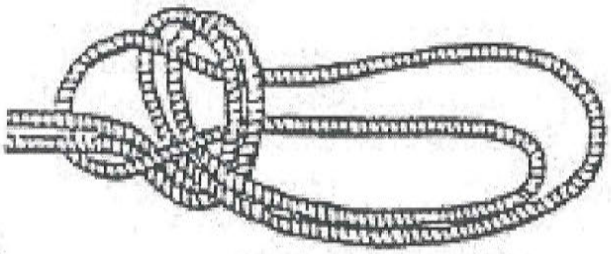


Bowline



Running Bowline

Becket Knot



Bowline on a Bight

Table A7

APPROXIMATE SAFE WORKING LOADS FOR NEW FIBER ROPES

Approximate Safe Working Loads of Braided Synthetic Fiber Ropes (Lbs.) Safety Factor = 5			
Normal Rope Diameter (inches)	Nylon Cover Nylon Core	Nylon Cover Polypropylene Core	Polyester Cover Polypropylene Core
1/4	420	—	380
5/16	640	—	540
3/8	880	680	740
7/16	1,200	1,000	1,060
1/2	1,500	1,480	1,380
9/16	2,100	1,720	—
5/8	2,400	2,100	2,400
3/4	3,500	3,200	2,860
7/8	4,800	4,150	3,800
1	5,700	4,800	5,600
1-1/8	8,000	7,000	—
1-1/4	8,800	8,000	—
1-1/2	12,800	12,400	—
1-5/8	16,000	14,000	—
1-3/4	19,400	18,000	—
2	23,600	20,000	—

Table A8

MANILA ROPE

	Change the rope diameter into eights-of-an-inch. Square the numerator and multiply by 20.
Example: a	1/2 inch manila rope = 4/8 inch diameter SWL= 4 x 4 x 20= 320 lbs.
b	5/8 inch manila rope SWL= 5 x 5 x 20= 500 lbs.
c	1 inch manila rope= 8/8 inch diameter 8 x 8 x 20= 1,280 lbs.

Table A9

NYLON ROPE

	Change the rope diameter into eights-of-an-inch. Square the numerator and multiply by 60.
Example:	1/2 inch manila rope = 4/8 inch diameter SWL= 4 x 4 x 60= 960 lbs.

Table A10

POLYESTER ROPE

	Change the rope diameter into eights-of-an-inch. Square the numerator and multiply by 60.
Example:	1/2 inch manila rope = 4/8 inch diameter SWL= 4 x 4 x 60= 960 lbs.

Table A11

POLYETHYLENE ROPE

	Change the rope diameter into eights-of-an-inch. Square the numerator and multiply by 35.
Example:	1 inch manila rope = 8/8 inch diameter SWL= 8 x 8 x 35= 2,240 lbs.

Table A12

POLYPROPYLENE ROPE

	Change the rope diameter into eights-of-an-inch. Square the numerator and multiply by 40.
Example:	1/2 inch manila rope = 4/8 inch diameter SWL= 4 x 4 x 40= 640 lbs.

Table A13

AC LIVE-LINE WORK
MINIMUM APPROACH DISTANCES

	MAD (ft) - Phase to Ground Exposure	Transient Overvoltage	MAD (ft) - Phase to Phase Exposure
300-750V	1'1"		1'1"
751-5000V	2'1"		2'1"
5-15kV	2'2"	3	2'2"
15-25kV	2'7"	3	2'7"
25-36kV	2'7"	3	2'7"
36-46kV	2'10"	3	2'10"
46-72.5kV	3'4"	3	3'4"
72.6-121kV	3'5"	3	4'2"
121.1-145kV	3'10"	3	4'10"
145.1-169kV	4'3"	3	5'5"
169.1-242kV	5'8"	3	8'4"
242.1-362kV	9'1"	3	14'9"
362.1-420kV	8'3"	2.4	13'8"
420.1-550kV	11'11"	2.4	20'3"
550.1-800kV	15'11"	2	27'10"

Table A14

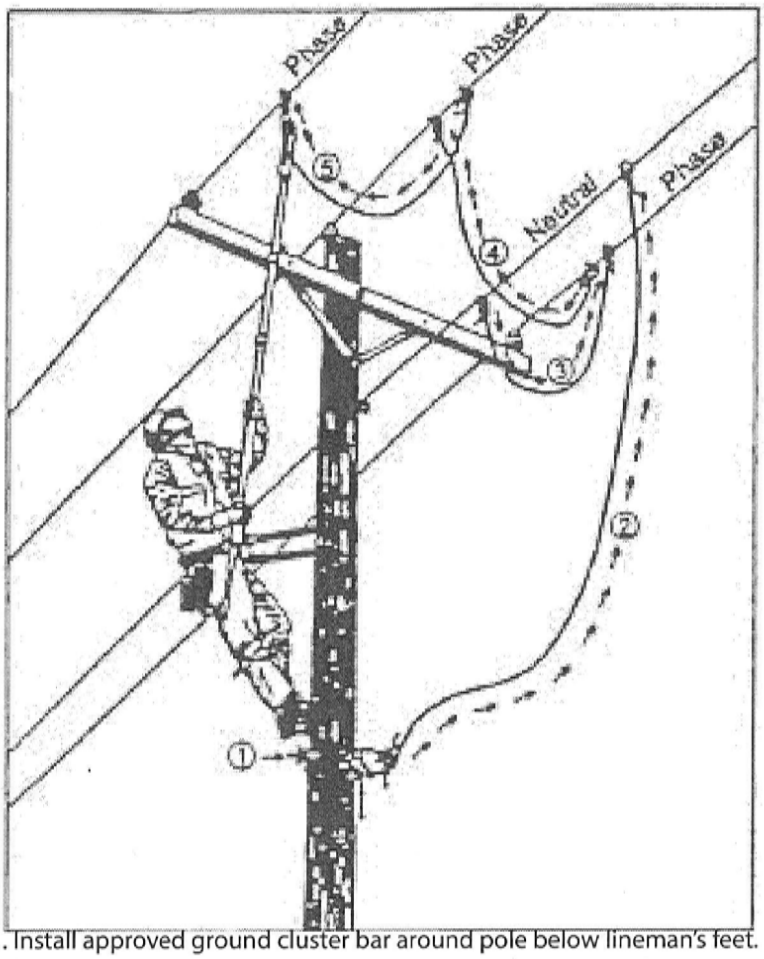
ALTITUDE CORRECTION FACTOR

Altitude		Correction Factor
Ft	m	
3,000	900	1.00
4,000	1,200	1.02
5,000	1,500	1.05
6,000	1,800	1.08
7,000	2,100	1.11
8,000	2,400	1.14
9,000	2,700	1.17
10,000	3,000	1.20
12,000	3,600	1.25
14,000	4,200	1.30
16,000	4,800	1.35
18,000	5,400	1.39
20,000	6,000	1.44

Note: If the work is performed at elevations greater than 3,000 ft (900 m) above mean sea level, the minimum approach distance shall be determined by the correction factor corresponding to the altitude at which the work is performed.

Table A15

INSTALLING EQUI-POTENTIAL GROUNDS



1. Install approved ground cluster bar around pole below lineman's feet.

2. Bond the ground cluster to the primary neutral.

3. Bond from the primary neutral (preferably), or from the cluster bar to the first phase.

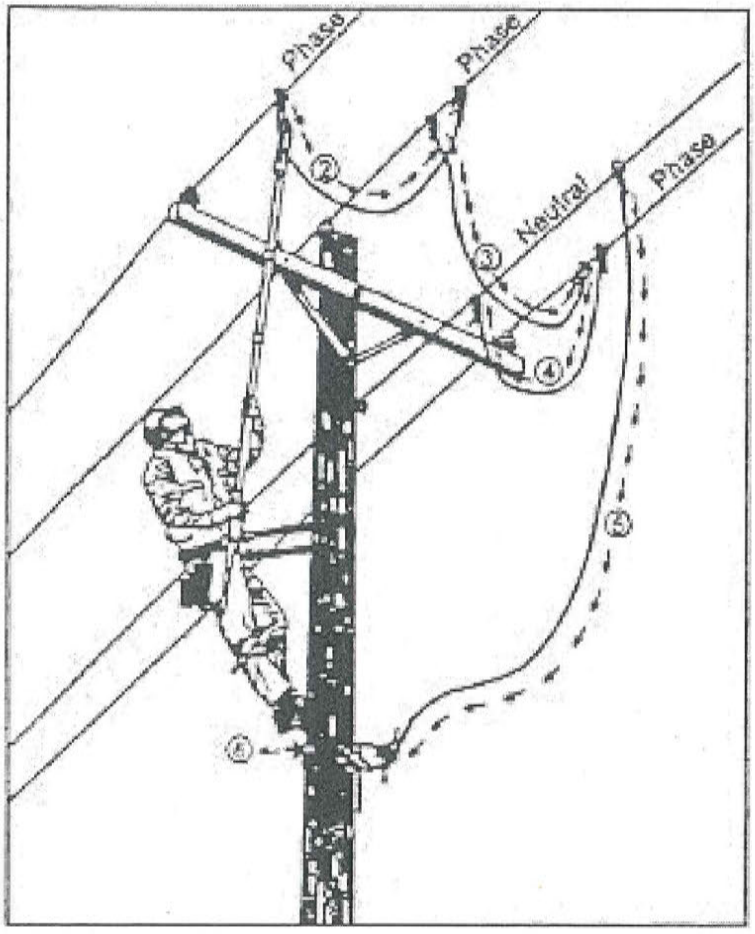
4. Short circuit from the first phase to the second phase, or from the primary neutral to the second phase.

5. Short circuit from the second phase to the third phase, or from the primary neutral to the third phase.

6. Bond all conductive objects within the lineman's (extended) reach to the cluster or the primary neutral. (Picture does not show other conductive objects.)

Table A16

REMOVING EQUI-POTENTIAL GROUNDS



1. Remove bonds from all conductive objects within the Lineman's (extended) reach. (Picture does not show other conductive objects.)

2. Remove ground from the third phase to the second phase, or from the third phase to the primary neutral.

3. Remove ground from the second phase to the first phase, or from the second phase to the primary neutral.

4. Remove ground from the first phase to the primary neutral, or from the first phase to the ground cluster.

5. Remove ground from the ground cluster to the primary neutral.

6. Remove ground cluster bar.

Table A17

SLINGS

Nylon Web Eye & Eye Slings

[illegible]

Web Width	Code Number				Code Number			
	[illegible]				[illegible]			
1"	EE1-901	1,600	1,200	3,200	EE2-901	3,200	2,400	6,400
2"	EE1-902	3,200	2,400	6,400	EE2-902	6,400	4,800	12,800
3"	EE1-903	4,800	3,600	9,600	EE2-903	8,900	6,500	17,300
4"	EE1-904	6,400	4,800	12,800	EE2-904	11,500	8,600	23,000
5"	EE1-905	8,000	6,000	16,000	EE2-905	13,800	10,300	27,500
6"	EE1-906	9,600	7,200	19,200	EE2-906	16,500	12,300	33,000

Nylon Endless Web Slings

[illegible]

Web Width	Code Number	Rated Capacities (lbs.) Vertical	Choker	Basket	Code Number	Rated Capacities (lbs.) Vertical	Choker	Basket
	[illegible]				[illegible]			
1"	EN1-901	3,200	2,500	6,400	EN2-901	6,400	4,800	12,800
2"	EN1-902	6,400	4,800	12,800	EN2-902	12,200	9,100	24,400
3"	EN1-903	8,600	6,500	17,200	EN2-903	16,400	12,300	32,800
4"	EN1-904	11,500	9,200	23,000	EN2-904	20,700	16,500	41,400
5"	EN1-905	13,800	10,300	27,500	EN2-905	24,800	18,600	49,600
6"	EN1-906	16,500	11,500	33,000	EN2-906	28,600	21,500	57,200

Refuse and remove nylon web slings for:

- [illegible]
- Acid or Alkali burns
- Melting or Charring
- Holes, Tears, Cuts, Snags
- [illegible]
- Broken or Worn Stitching
- Knots in any part of the sling
- [illegible]
- [illegible]

Wire Rope Sling Capacities (lbs.)**

[illegible]

Size in inches							Size in inches
1/4	1,100	840	2,200	1,900	1,550	1,100	1/4
3/8	2,400	1,800	4,800	4,200	3,400	2,400	3/8
1/2	4,400	3,200	8,800	7,600	6,200	4,400	1/2
5/8	6,800	5,000	13,600	11,800	9,600	6,800	5/8
3/4	9,700	7,200	19,400	16,800	13,600	9,700	3/4
7/8	13,000	9,600	26,000	22,000	18,300	13,000	7/8
1	17,000	12,800	34,000	29,000	24,000	17,000	1
1-1/8	20,000	15,000	40,000	34,000	28,000	20,000	1-1/8
*1-1/4	26,000	19,200	52,000	44,000	36,000	26,000	*1-1/4
*1-3/8	30,000	24,000	62,000	54,000	44,000	30,000	*1-3/8
*1-1/2	36,000	28,000	74,000	64,000	52,000	36,000	*1-1/2
*1-3/4	50,000	38,000	98,000	86,000	70,000	50,000	*1-3/4
*2	64,000	48,000	128,000	110,000	90,000	64,000	*2

[illegible]

Wire Rope Clips

[illegible]

Rope size in inches	No. of Clips	Turn back in inches	Torque in ft. lbs.	Rope size in inches	No. of Clips	Turn back in inches	Torque in ft. lbs.
5/16	2	4-3/4	15	3/4	4	18	130
3/8	2	6-1/2	45	7/8	4	19	225
1/2	3	11-1/2	65	1	5	26	225
5/8	3	12	95	1-1/8	6	34	360

Table A17

SLINGS- Continued

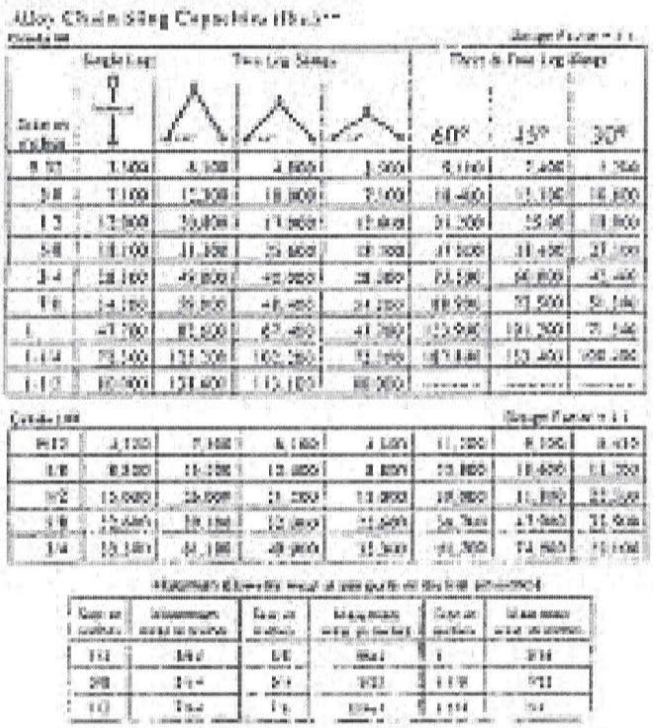


Table A17

SLINGS- Continued
Wire and Synthetic Web

Wire Rope Slings (29 CFR 1910.184 ASME B30.9) Good Practices #1

1. Do not exceed rated capacity.
2. Min of 10 dia. Between sleeves/splices.
3. Consult mfg Below -60 F. over 400 F.
4. Weld-proof test fittings prior to assembly.
5. Remove if:
   - Evidence of heat damage
   - Broken wires - x 10/Lay, 5in., 1 Strand/Lay
   - 1/3 wear of outside wires
   - Kinks – Crushing – Unstranding
   - Birdcaging – Corrosion
   - Distorted rope structure
   - Damaged end attachments
   - Hooks with 15% spread or 10-degree twist

1. Do not use knots to form eyes.
2. Use WR clips only if can't prefabricate.
3. Remove if:
   - Broken wires for multi-part slings: Less than 8-part and Cable Laid as 20/Lay, 20/braid/lay, 1 strand/sling –x 8 part or more as 40/Lay, 40/braid/Lay, 1 strand/sling.
   - Core damage – Severe abrasion
4. Use charting gear and avoid load slippage.
5. Don't drag slings. Avoid shock loads.
6. Don't choke on fittings, avoid pinch points.
7. Avoid hand-splice rotation, don't crush sling.
8. Place sling(s) in center bowl of hook.
9. Calculate additional tensions due to angles.
10. Don't place small sling eye on large hook.
11. Personnel stand clear of load.

Synthetic Web Slings (29 CFR 1910.184 ASME B30.9) Good Practices #2

1. Do not exceed rated capacity.
2. Do not use nylon web near acids, nor polyester web around caustics.
3. Repaired slings shall be proof tested to twice rated capacity.
4. Stitching is the only acceptable method to attach end fittings and form eyes.
5. Fittings shall be of minimum breaking strength equal to that of the sling.
6. Do not use at temp in excess of 180 degrees.
7. Remove if:
   - Acid or caustic burns
   - Melted or charred
   - Snags, punctures, tears, or cuts
   - Distortion of fittings
   - Broken or worn stitches

1. Slings shall be permanently marked with:
   a. Manufacturer name and stock number
   b. Rated load for types of hitches used
   c. Type of synthetic web material
2. Remove if:
   - Holes, tears, cuts, snags, crushing
   - No tag or illegible tag
   - Knots in any part of the sling
   - Excessive pitting or corrosion, or cracked distorted, or broken fittings
   - UV/sunlight damage
   - Other visible damage that causes doubt as to the strength of the sling
3. Use padding between sharp edges and sling.
4. Don't drag slings. Avoid shock loads.
5. Do not twist or kink the legs of a sling.
6. Do not shorten or lengthen using knots.
7. Place sling(s) in center bowl of hook.
8. Personnel stand clear of suspended load.

Table A17

SLINGS- Continued
Chain and Metal Mesh

Alloy Chain Slings

29 CFR 1910.184 ASME B30.9 #3

1. Do not exceed rated capacity.
2. Slings shall be permanently marked with size, grade, rated capacity and reach.
3. Slings shall be thoroughly inspected at intervals no greater than once every 12 months. Records of such inspections must be kept on file.
4. Makeshift links or fasteners made form bolts or rods shall not be used.
5. Worn or damaged slings or attachments shall not be used until repaired.
6. Mechanical coupling or low carbon steel repair links shall not be used to repair broken lengths of chain.
7. Remove if:
   - Heated above 1000 degrees.
   - Cracked/deformed master links, coupling or other components
   - Hooks are cracked and have been opened more than 15% or twisted more than 10 degrees from plane of unbent hook
   - Reduction in size of links at any point

1. Prior to use, welded components or new slings shall be proof tested to twice rated load.
2. Repaired slings shall be permanently marked with name of repairing agency.
3. Latches on hooks should seat properly, rotate freely, and show no permanent distortion.
4. Slings should be long enough so that the rated load is adequate when the angle of the legs is taken into consideration.
5. Check chain and attachments for wear, nicks, cracks, breaks, gouges, stretch, bends, weld splatter, discoloration from excessive temperature, and throat opening of hooks.

Metal Mesh Slings

29 CFR 1910.184 ASME B30.9 #4

1. Do not exceed rated capacity.
2. Slings shall be permanently marked with rated capacity for vertical basket and choker hitch loadings.
3. Coatings which diminish the rated capacity of a sling shall not be applied.
4. Repaired slings shall not be used unless repaired by manufacturer or equal entity.
5. Handles shall have a rated capacity at least equal to the metal fabric.
6. Remove if:
   - Broken weld or broken brazed joint along the sling edge
   - Reduction in wire diameter of 25% due to abrasion or 15% due to corrosion
   - Lack of flexibility due to distortion of the fabric
   - Distortion of female handle increasing the depth of slot more than 10%

1. Design factor shall be a minimum of 5.
2. A sling in which the spirals are locked or without free articulation shall not be used.
3. Slings used in pairs should be attached to a spreader beam.
4. Never hammer a sling to straighten a spiral or cross rod to force a spiral into position.
5. Remove if:
   - Distortion of either end fitting decreasing the width of eye opening by more than 10%
   - Broken wires in any part of the mesh
   - Distortion of choker fitting increasing depth of slot by more than 10%
   - A 15% reduction of original cross-sectional area at any point around hook or end fitting
   - Visible distortion of either end fitting out of its plane
   - Cracked end fitting

Table A17

SLINGS- Continued
Below-the-Hook Lifting Devices

Below-the-Hook Lifting Devices — ASME/ANSI B30.20 #5

1. A nameplate or other permanent marking shall be affixed displaying the following:
   a. Manufacturer's name and address
   b. Serial number
   c. Lifter weight, if over 100 lbs (45kg)
   d. Rated load
2. Design factor shall be a minimum of 3, based on yield strength for load bearing structural components.
3. All welding shall be in accordance with ANSI/AWS D1.1.
4. Exposed moving parts constituting a hazard under normal operating conditions should be guarded.
5. Electrical components and wiring shall comply with Article 610 of ANSI/NFPA 70.
6. During frequent or periodic inspections, any deficiencies, such as listed below, shall be carefully examined, and determination made as to whether they constitute a hazard:
   a. Structural deformation, cracks, or excessive wear on any part of the lifter
   b. Loose or missing guards, fasteners, covers, stops, or nameplates
   c. All functional operating mechanisms for misadjustment interfering with operation
   d. Loose bolts or fasteners
   e. Cracked or worn gears, pulleys, sheaves, sprockets, bearings, chains, and belts
   f. Excessive wear of friction pads, linkage, and other mechanical parts
   g. Excessive wear at hoist hooking points and load support clevises or pins

Table A18

CALL TWO DAYS BEFORE YOU DIG

Table A19

TOLERENCE ZONE

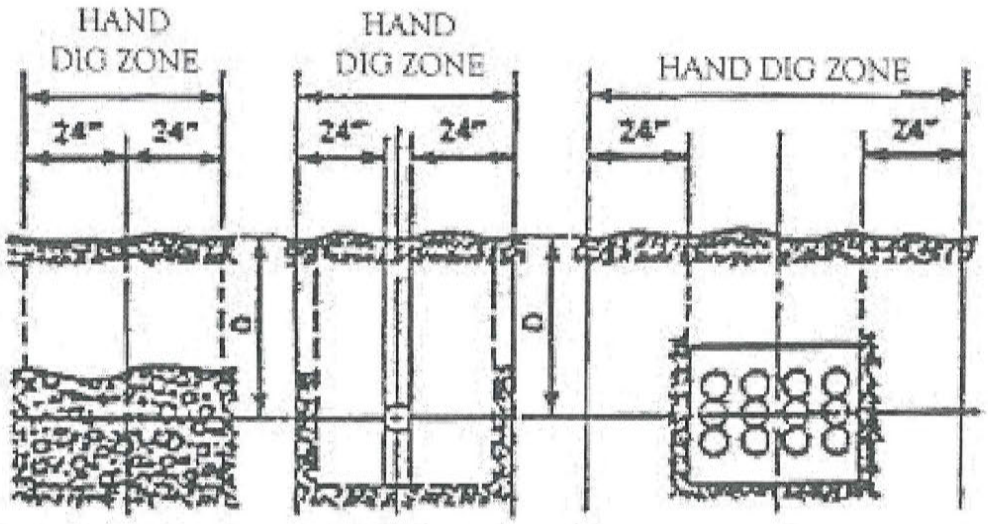


Table A20

TRENCH SHORING MINIMUM REQUIREMENTS

Depth	Kind of	Size and Spacing of Members												
Of	Condition	Uprights			Stringers		Cross Braces				Maximum Spacing			
Trench	Of Earth	Min Dimension	Min Spacing		Min Dimension	Max Spacing	Up to 3 feet	3 to 6 feet	6 to 9 feet	9 to 12 feet	12 to 15 feet	Vertical	Horizontal
Feet		Inches	Feet		Inches	Feet	Inches	Inches	Inches	Inches	Inches	Feet	Feet
5 to 10	Hard, compact	3 x 4 or 2 x 6	6				2 x 6	4 x 4	4 x 6	6 x 6	6 x 8	4	6
	Likely to crack	3 x 4 or 2 x 6	5		4 x 6	4	2 x 6	4 x 4	4 x 6	6 x 6	6 x 8	4	6
	Soft, sandy, Or filled	3 x 4 or 2 x 6	Close sheeting		4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
	Hydrostatic pressure	3 x 4 or 2 x 6	Close sheeting		3 x 8	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
10 to 15	Hard, compact	3 x 4 or 2 x 6	4		4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
	Likely to crack	3 x 4 or 2 x 6	3		4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
	Soft, sandy, Or filled	3 x 4 or 2 x 6	Close sheeting		4 x 6	4	4 x 6	6 x 6	6 x 8	8 x 8	8 x 10	4	6
	Hydrostatic pressure	3 x 6	Close sheeting		8 x 10	4	4 x 6	6 x 6	6 x 8	8 x 8	8 x 10	4	6
15 to 20	All kinds or conditions	3 x 6	Close sheeting		4 x 12	4	4 x 12	6 x 8	8 x 8	8 x 10	10 x 10	4	6
Over 20	All kinds or conditions	3 x 6	Close sheeting		8 x 8	4	4 x 12	8 x 8	8 x 10	10 x 10	10 x 12	4	

Table A21

ANGLE OF REPOSE FOR SLOPING SIDES OF EXCAVATIONS

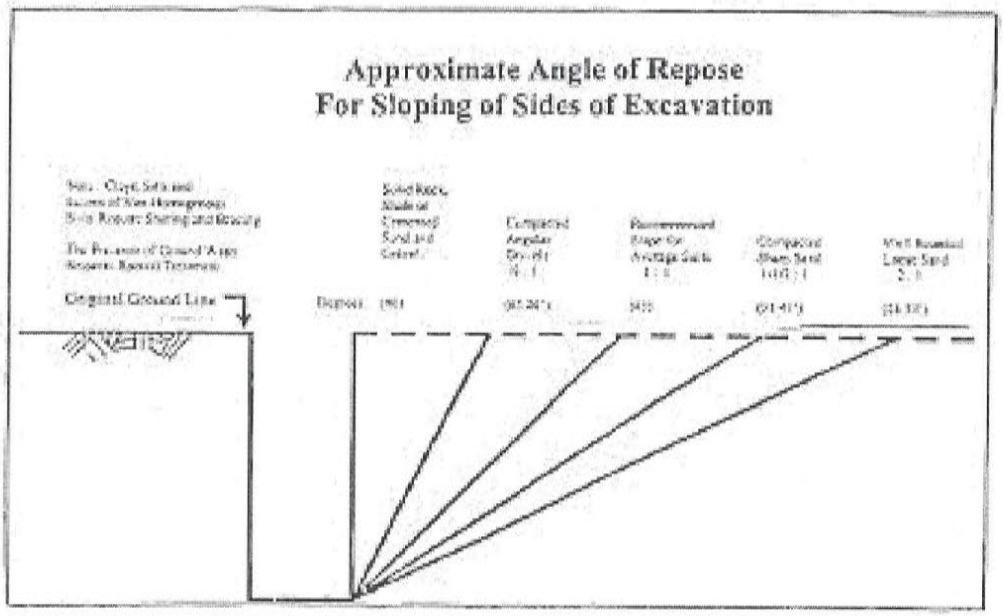


Table A22

MAXIMUM ALLOWABLE SLOPES FOR EXCAVATIONS

Maximum Allowable Slopes for Excavations Less than 20 Feet Deep*	
Solid or Rock Type	Maximum Allowable Slopes (H:V)**
Stable Rock	Vertical (90°)
Type A***	3/4:1 (53°)
Type B	1:1 (45°)
Type C	1:1/2:1 (34°)

Notes:

* Sloping or benching for excavations greater than 20-feet deep shall be designed by a registered professional engineer.

** Numbers in parentheses are angles expressed in degrees from the horizontal. Angles have been rounded off.

*** A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°.)

Table A23

APPLICABLE OSHA STANDARDS 1910

SUB PART	STANDARD	SUBJECT
A	1910.1-8	General
B	1910.1-19	Adoption of Federal Standards
C	1910.20	General Safety and Health
D	1910.21-30	Walking-Working Surfaces
E	1910.35-38	Means of Egress
F	1910.66-68	Powered Platforms and Manlifts
G	1910.94-98	Occupational Health and Enviornmental Controls
H	1910.101-120	Hazardous Material
I	1910.132-139	Personal Protective Equipment
J	1910.141-147	General Environmental Controls
K	1910.151-152	Medical and First Aid
L	1910.155-165	Fire Protection
M	1910.166-169	Compressed Gas and Air Equipment
N	1910.176-184	Materials Handling and Storage
O	1910.211-219	Machine Guarding
P	1910.241-244	Portable Tools and Equipment
Q	1910.251-255	Welding, Cutting and Brazing Controls
R	1910.261-272	Special Industries
S	1910.301-399	Electrical
Z	1910.111-1500	Toxic and Hazardous Substances

Table A24

APPLICABLE OSHA STANDARDS 1926

SUB PART	STANDARD	SUBJECT
A	1926.1-5	General
B	1926.10-16	General Interpretations
C	1926.20-35	General Safety and Health
D	1926.50-66	Occupational Health and Environment Controls
E	1926.95-107	Personal Protecitve and Life Saving Equipment
F	1926.150-159	Fire Protection and Prevention
G	1926.200-203	Signs, Signals and Barricades
H	1926.250-252	Materials Handling, Storage, Use and Disposal
I	1926.300-307	Tools—Hand and Power
J	1926.350-354	Welding and Cutting
K	1926.400-449	Electrical
L	1926.450-454	Scaffolds
M	1926.500-503	Fall Protection
N	1926.550-556	Cranes, Derricks, Hoists, Elevators and Conveyors
O	1926.600-606	Motor Vehicles, Mechanized Equipment
P	1926.650-652	Excavations
Q	1926.700-706	Concrete and Masonry Construction
R	1926.750-753	Steel Erection
T	1926.850-860	Demolition
U	1926.900-914	Blasting and Use of Explosives
V	1926.950-960	Power Transmission and Distribution
W	1926.1000-1003	Rollover Protective Structures
X	1926.1050-1080	Ladders
Z	1926.1100-1158	Toxic and Hazardous Substances

APPENDIX B

Glossary

-A-

Aerial Device: Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated worksite.

Affected Employee: An employee whose job requires him or her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout/tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

Alive or Live: Electrically connected to a source of potential difference or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term "live" is sometimes used in place of the term "current carrying," where the intent is clear, to avoid repetition of the longer term.

ANSI: American National Standards Institute.

Approved: The term "approved," when used in connection with methods, tools, or equipment, refers to the methods, tools, or equipment approved by the Cooperative through committee, departmental action, or safety rule.

Attendant: An employee assigned to remain immediately outside the entrance to an enclosed or other space to render assistance as needed to employees inside the space.

Authorized Person: One who has the authority to perform specific duties under certain conditions or who is carrying out orders from responsible authority and who is knowledgeable in the construction and operation of the equipment and the hazards involved.

Automatic Circuit Recloser: A self-controlled device for interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold-closed or lockout operation.

-B-

Barricade: A physical obstruction such as tapes, cones or A-Frame type wood or metal structures intended to warn and limit access to a hazardous area.

Barrier: A physical obstruction, which is intended to prevent contact with energized lines or equipment or to prevent unauthorized access to a work area.

Benching (Benching System): A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Body Belt (Safety Belt): A strap that both secures around the waist and attaches to a lanyard, lifeline, or strap.

Body Harness: Straps that are secured about an employee in a manner that distributes the arresting forces over at least the thighs, shoulders, and pelvis with provisions for attaching a lanyard, live-line, or deceleration device.

Bond: The electrical interconnection of conductive parts designed to maintain a common electrical potential.

Bus: A conductor or a group of conductors that serve as a common connection for two or more circuits.

Bushing: An insulating structure, including a through conductor or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purposes of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

-C-

Cable: A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

Cable Sheath: A conductive protective covering applied to cables (may consist of multiple layers, one or more of which is conductive).

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Clearance (for work): Authorization to perform specified work or permission to enter a restricted area.

Clearance (between objects): The clear distance between two objects measured surface to surface.

Combustible Liquids (Class III): Any liquid having a flash point at or higher than 140 degrees F but less than 200 degrees F. Examples: cleaning solvents, carbolic acid, electroline, naphthalene, and creosote oil.

Communication Lines: The conductors and their supporting or containing structures that are used for public or private signal or communication service.

Note: Telephone, telegraph, railroad signal, data, fire, police alarm, community television antenna, and other similar systems are included.

Commercial Vehicles:

a Interstate: Any self-propelled or towed vehicle used on public highways in interstate commerce to transport passengers or property when:

1 The vehicle has a gross vehicle weight rating or gross combination weight rating of 10.001 or more pounds; or

2 The vehicle is used in the transportation of hazardous materials in a quantity requiring placards.

Note: In addition to vehicles traveling between states, the interstate classification applies to vehicles traveling between the United States and Canada and may apply to vehicles traveling on Native American Reservations if that tribe is a sovereign nation.

b Intrastate: A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle:

1 Has a gross combination weight rating of 26,001 or more pounds inclusive of a towed unit with a gross vehicle weight rating of more than 10,000 pounds; or

2 Has a gross vehicle weight rating of 26,001 or more pounds; or

3 Is of any size and is used in the transportation of materials found to be hazardous for the purpose of the Hazardous Materials Transportation Act and which require the motor vehicle to be placarded.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and

who has authorization to take prompt corrective measures to eliminate them.

Conductor: A material, usually in the form of a wire, cable, or busbar, suitable for carrying an electric current.

Conductor, Covered: A conductor covered with a dielectric cover having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.

Confined Space: An enclosed space that is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits, and dike areas); is not designed for continuous employee occupancy; and has one or more of the following characteristics:

c Contains or has a known potential to contain a hazardous atmosphere

d contains a material with the potential for engulfment of an entrant

e has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section, or

f contains any other recognized serious safety or health hazard.

Cooperative: A member-owned rural electric distribution, transmission or generation company in business for the purpose of providing electric service.

Current-Carrying Part: A conducting part intended to be connected in an electric circuit to a source of voltage. Non-current carrying parts are those not intended to be so connected.

-D-

De-energized: Free from any electrical connection to a source of potential difference and from electric charge not having a potential different from that of the earth.

Disconnected: Disconnected from any electrical source of supply.

-E-

Effectively Grounded: Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazard to connected equipment or to persons.

Electric Supply Equipment: Equipment that produces, modifies, regulates, controls, or safeguards a supply of electrical energy.

Electric Supply Lines: Conductors used to transmit electrical energy and their necessary supporting or containing structures. Signal lines of more than 400 volts are always supply lines within this section, and those with less than 400 volts are considered as supply lines if so run and operated throughout.

Emergency: An emergency occurs when an unusual condition exists that endangers life and/or property.

Enclosed: Surrounded by a case, cage, or fence, which will protect the contained equipment and prevent accidental contact of a person with live parts.

Enclosed Space: A working space such as a manhole, vault, tunnel, or shaft that has a limited means of egress or entry, that is designed for periodic employee entry under normal operating conditions, and that under normal conditions does not contain a hazardous atmosphere but may contain a hazardous atmosphere under abnormal conditions.

Note: Spaces that are enclosed but not designed for employee entry under normal operating conditions are not considered to be enclosed spaces. Similarly, spaces that are enclosed and that are expected to contain a hazardous atmosphere are not considered to be enclosed spaces. Such spaces meet the definition of permit spaces in 20 CFR 1910.146, and entry into them must be performed in accordance with that standard.

Energized (also Alive or Live): Electrically connected to a source of potential difference or electrically charge so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment.

Energy Source: Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal or other energy source that could cause injury to personnel.

Equipment (electric): A general term including material, fittings, devices, appliances, fixtures, apparatus and the like used as part of or in connection with an electrical installation.

Excavations: Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Exposed:

g In such a position that in case of failure of supports or insulation, contact with another circuit or line may result.

h An object or device that can be inadvertently touched or approached nearer than a safe distance by any person. Applied to objects not suitably guarded or situated. Not isolated or guarded.

-F-

Fall Arrest System: The assemblage of equipment such as line-worker's body belt or full body harness in conjunction with a deceleration device and an anchorage to limit the forces a worker experiences during a fall from one elevation to another.

Fall Protection Program: A program intended to protect workers from injury due to falls when working at elevations.

Fall Prevention System: A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning devices, guardrail, barriers, and restraint systems.

Fall Protection System (hardware): Consists of either a fall prevention system or a fall arrest system.

Flammable Liquids:

Class I: Any liquid having a flashpoint below 100 degrees F. Examples: gasoline, turpentine, ethyl alcohol, benzene, and acetone.

Class II: Any liquid having a flashpoint at or above 100 degrees F but below 140 degrees F. Examples: acetate, kerosene, camphor, and oil.

Flares: The word "flares" shall be used to indicate flares, torches, fuses, red lanterns, reflectors, or any other equipment that is adaptable for the purpose intended.

Foreman or Supervisor: Any person, regardless of classification,

who is directly in charge of a specific job or specific jobs. Depending upon local classification, this person may be a "lead man," working foreman, foreman, general foreman, supervisor, or superintendent.

Free Fall: The act of falling before the personal fall protection system begins to arrest the fall.

-G-

Ground (noun): The connection, established either intentionally or accidentally, of an electric circuit or equipment with reference ground through a conductor, or other conducting object or substance.

Ground (reference): That conductive body, usually earth, to which an electric potential is referenced.

Ground (verb): Connecting or establishing a connection, either intentionally or accidentally, of an electric circuit or equipment to reference ground. Connect to earth or some conducting body that serves in place of earth.

Grounding Electrode (Ground Electrode): A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it and for dissipating into the earth current conducted to it.

Grounded System: A system of conductors in which at least one conductor or point (usually the middle wire or neutral point of transformer or generator winding) is intentionally grounded; either solidly or through a current-limiting device (not a current-interrupting device).

Guarded: Protected by personnel, or covered, fenced, or enclosed by means of suitable casings, barrier rails, screens, mats, platforms, or other suitable devices in accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or objects. (Wires that are insulated but not otherwise protected are not considered guarded.)

-H-

Hazard Communication Program: Cooperative-developed program to ensure that information concerning hazardous chemicals (material) is transmitted to employees through the use of warnings, procedures, material safety data sheets, and employee training.

Hazardous Material (Substances): Any substance that is a physical hazard or a health hazard. A substance is a physical hazard when there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive. The substance is a health hazard when it is determined to be a carcinogen, a toxic or highly toxic agent, a reproductive toxin, irritant, corrosive, sensitizer, hepatotoxin, nephrotoxic, neurotoxin, an agent that acts on the hematopoietic system, or an agent that damages the lungs, skin, eyes, or mucous membranes.

Highly Hazardous Chemical: A substance possessing toxic, reactive, flammable, or explosive properties that are listed in OSHA standard 29 CFR 1910.119.

High-Power Test: Tests in which fault currents, load currents and line-dropping currents are used to test equipment, either at the equipment's rated voltage or at lower voltages.

High-Voltage Test: Tests in which voltages of approximately 1000 volts are used as a practical minimum and in which the voltage source has sufficient energy to cause injury.

High Wind: A wind of such velocity that an employee would be exposed to being blown from elevated locations, an employee or material handling equipment could lose control of material being handled, or an employee could be exposed to other hazards not controlled by the standard involved. Winds exceeding 40 miles per hour or winds exceeding 30 MPH if material handling is involved are considered to be high winds unless precautions are taken to protect employees from the hazardous effects of the wind

Hold Cards: Also called "Hold Tags." A card or tag-type device, usually having a predominant color of white or red, which warns or cautions against the operation of a particular switch, device, circuit, tool, machine, etc. The use of such tags must be respected; equipment or items so tagged must not be activated or used without full and proper authority from a responsible person.

Hot-Line Tools and Ropes: Those tools and ropes that are especially designed for work on energized high voltage lines and equipment. Insulated aerial equipment especially designed for work on energized high voltage lines and equipment shall be considered "hot-line".

-I-

Immediately Dangerous to Life or Health (IDHL): Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Insulated: Separated from other conducting surfaces by a dielectric substance or air space, permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space.

Insulation: That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

Isolated: An object that is not readily accessible to persons unless special means of access are used.

-L-

Lanyard (Strap): A flexible line used to secure a body belt or body harness to a lifeline or directly to a point of anchorage.

Lifeline: A line provided for direct or indirect attachment to a worker's body belt, body harness, lanyard, or deceleration device. Such lifelines may be horizontal or vertical in application.

Line-Clearance Tree Trimmer: An employee who, through related training or on-the-job experience or both, is familiar with the special techniques and hazards involved in line clearance.

Line-Clearance Tree Trimming: The pruning, trimming, repairing, maintaining, removing or clearing of trees or the cutting of brush that is within 10 feet (305 cm) of electric supply lines and equipment.

-M-

Material Safety Data Sheet: A document provided by manufacturers and importers of chemicals to convey information to the users of their products. The information includes data on physical characteristics, fire and explosion hazards, reactivity, and health hazards; special precautions; and fire and spill procedures.

Minimum Approach Distance: The closest distance an employee is permitted to approach an energized or a grounded object.

-N-

Near Miss: An unintended, unplanned, and unexpected event that could have, but did not result in personal injury or property damage.

-O-

Occupational Safety and Health Act (OSHA) of 1970: Requires employers to provide to employees a workplace free from recognized hazards and to comply with safety and health standards established by the Act. The act also charges each employee with a legal duty to comply with the act's safety and health standards. The federal act pertains to most employers but specifically excludes federal, state, and local government employees. However, numerous states have developed safety and health standards that require compliance by all government entities.

-P-

Pad Mount: Transformer or equipment in a surface-mounted enclosure normally worked from ground level.

Physically Render Inoperative: The use of locks, blind flanges, or other similar devices or procedures to prevent the operation of switches, breakers, valves, and operating controls.

Positioning Device: A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free.

Primary Compartment: A compartment containing voltages greater than 600 volts.

Primary Voltage: Any electrical circuit that normally operates at more than 600 volts.

Public: Any individual not an employee or representative of the cooperative.

-Q-

Qualified Person (for electric power generation, transmission, and distribution): One knowledgeable in the construction and operation of the electric power generation, transmission, and distribution equipment involved, along with the associated hazards. Qualified employees shall be trained and competent in:

i The skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment,

j The skills and techniques necessary to determine the nominal voltage of exposed live parts,

k The minimum approach distance corresponding to the voltages to which the qualified employee will be exposed, and

l The proper use of precautionary techniques, personal protective equipment, insulating and shielding materials, and live-line tools for working on or near exposed energized parts of electric equipment.

An employee, who is undergoing on-the-job training and who, in the course of that 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 employee is considered to be a qualified employee for the performance of those duties. An employee undergoing on-the-job training must meet the full requirements for fall protection.

Qualified Person (general): A qualified person is one who is specially qualified to do a particular job because of education, training and/or experience. It is possible, even likely, that a qualified person in one context or situation would not be a qualified person in another situation.

-R-

Road: The paved or unpaved surface of a roadway upon which vehicles are intended to travel. When the road is paved, the entire surface is thus included.

Roadway: The road and the areas immediately adjacent thereto, such as the shoulder of the road, parking strip, etc. This area normally extends approximately 15 feet from the road.

-S-

Safety Can: An approved closed container of not more than 5-gallon capacity having a flash-arresting screen, spring-closing lid, and spout cover and designed so that it will safely relieve internal pressure when subjected to a fire.

Safety Rule: A positive rule requiring compliance by all employees concerned. Deviation from safety rules is not permitted and is subject to disciplinary action.

Secondary Compartment: A compartment containing voltages less than 600 volts.

Secondary Voltage: Any electrical circuit that normally operates at less than 600 volts.

Shall: When the word "shall" appears in the wording of a rule, the rule is to be obeyed as written. (A mandatory requirement)

Shield (Shield System): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shield structures can be permanent or portable and moved along as work progresses.

Shoring (Shoring System): A structure such as metal, hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Should: When the word "should" appears in the wording of a rule, the rule is to be obeyed as written when it is reasonable and practical to do so. (An advisory requirement)

Sloping (Sloping System): A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Snap-Hook: A self-closing device with a keeper, latch, or other similar arrangement that will remain closed until manually opened. Such devices include self-closing, single-action, double-action, or double-locking snap-hooks.

Step Bolt: A bolt or rung attached at intervals along a structural member and used for foot placement during climbing or standing.

Switch: A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

System Operator: A qualified person designated to operate the system or its parts.

-T-

Tailboard Safety Talk: A short informal discussion of the work to be accomplished and the safety measures to be incorporated. Normally conducted by the foreman, these discussions are sometimes referred to as "tailgate talks," "tool box talks," or "Five-minutes safety talks."

Transferring: The act of moving from one distinct object to another.

Transitioning: The act of moving from one location to another on equipment or a structure while going around or over an object.

-U-

Underground Residential Distribution (URD): The necessary facilities to furnish underground service, generally to residential and commercial customers and usually through directly buried cable.

Unsafe Conditions: Used to indicate dangerous conditions, hazardous conditions, defective conditions, or unusual conditions that could be conducive to accidents.

Utility: The employer. The entity having jurisdiction and control over the operation of the utility (including such entities as municipal utilities, electrical cooperatives, etc.).

-V-

Vault: An enclosure above or below ground, which personnel may enter, used for installing, operating, and/or maintaining equipment and/or cable.

Voltage: The effective (RMS) potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected. Low voltage includes voltages up to 600 volts. High voltage shall mean voltages in excess of 600 volts.

Voltage of an Effectively Grounded Circuit: The voltage between any conductor and ground, unless otherwise indicated.

-W-

Warning Signs: For the purpose of these rules, any sign or similar means of employee or public notification alerting an employee to an actual or possible hazard. Included are "Danger" and

"Caution" signs, traffic protections signs, instructional signs, and informational signs.

Umatilla Electric Cooperative

Electrical Facility Inspection

Inspection procedures and schedules shall be established to meet the requirements of the National Electrical Safety Code (NESC), Oregon Public Utility Commission (OPUC), and Rural Utilities Service (RUS).

Such procedures and inspections are intended to effect repairs prior to failures for continuity of service, safety to the public and employees, and to extend the useful life of the equipment to the fullest extent.

Electrical Facility Inspections and Corrections shall be summarized annually.

The following tables illustrate the established inspection and maintenance schedules based on accepted utility practice for local operating conditions.

Line Inspection:

	Overhead Lines (Distribution & Transmission)			Underground		
Type	New & Upgraded	Public Safety (Line Patrol)	Detailed (Thorough)	New & Upgraded	Public Safety	Detailed
Frequency	Annually 10%	2 year cycle (1 year RUS ?)	10 year cycle	Annually 10%	2 year cycle ?	10 year cycle Includes visible cable condition inspection when excavated.
Method	Work Order Inspections	Visual Drive-by	Includes poles over 15 years testing for decay.	Work Order Inspections	Visual Drive-by	20 year ? replacement schedule.
Resource	UEC	UEC	Contractor / UEC	UEC	Contractor / UEC	Contractor / UEC
Source	OPUC 860-024-0011	OPUC 2c 860-024-0011 RUS 1730-1 A2, 3	OPUC 1b 860-024-0011 RUS 1730B- 121, 3.2	OPUC 1a 860-024-0011	RUS 1730-1 A4	OPUC 1Bc 860-024-0011 RUS 1730-1 A4, 5

Line Equipment Inspection:

Type	Regulators	Field Reclosers	Capacitors	Distribution Transformers
Frequency	Operating Inspection 6 months	Visual & obtain counter readings annually.	Test prior to installation and fuse replacement.	Gross fault test prior to installation. Periodic test coincident with line inspection.
Method	Oil test & Internal Inspection 100,000 operations or 5 years whichever is first. Note--CRN recommends at least 500,000 operations	Oil test & internal Inspection 100 operations or 5 years.	Visual Annually	Over 500 kva - infrared - 3 year cycle
Resource	Contractor / UEC	Contractor / UEC	UEC	Contractor / UEC
Source	UEC Siemens / Carlson RUS 5a CRN 3	UEC Siemens / Carlson RUS 5b	UEC	UEC RUS 5c

Substation & Switchyard Inspection:

	Security and grounds			Equipment				
Type	Fence & Security	Weed control	Building Maintenance	Power Transformers	Regulators	Reclosers & PCBs	Bus / Connectors	Relays ?
Frequency	Monthly Inspection	Annual Maintenance unless monthly inspection dictates more often.	Monthly Inspection	Monthly Inspection	Monthly Inspection	Monthly Inspection	Monthly Inspection	Monthly Inspection for targets.
Method	Visual	Visual	Annual Cleaning & Maintenance	Annual Gas & Oil tests Electrical test 6 year cycle	Oil test & Internal Inspection 100,000 operations or 5 year cycle Note-CRN recommends at least 500,000 operations.	Oil test & Internal Inspection 100 operations or 5 year cycle. VWE = 232 operations	Infrared 5 year cycle	Functional test annually Cleaned 3 year cycle
Resource	Contractor	Contractor / UEC	UEC	Contractor	Contractor / UEC	Contractor / UEC	Contractor / UEC	UEC
Source	OPUC 5b RUS 1a,b	RUS 1b	UEC	UEC RUS 1c OPUC 5b	UEC Siemens / Carlson RUS 1c CRN 3	Cooper Power Siemens / Carlson RUS 1c UEC	RUS 1c	RUS 1c

I. LINE INSPECTION

101. PURPOSE

A. To maintain Umatilla Electric Cooperative's electric distribution and transmission systems in a manner that assures reliability of electric service and safe conditions for members, employees, and the general public. And through contract with the city of Hermiston to meet these same objectives with respect to Hermiston Energy Services distribution system.

B. To ensure compliance with the distribution and transmission system inspection requirements mandated by the National Electrical Safety Code (NESC) rule numbers 012, 013, 121, 214 and 313 as interpreted by the Public Utilities Commission of Oregon. Transmission lines 200 KV and above will be inspected twice annually.

C. To ensure UEC's line maintenance practices and records are consistent with the requirements of 7 CFR 1730 and thereby support continued qualification for Rural Utilities Services (RUS) financing.

102. SCOPE

A. Inspections of New and Repaired Installations

Each new line installation shall be closely checked and corrected for compliance with the NESC before being placed into service.

B. Public Safety Inspections

Public safety inspections are intended to identify hazards and right-of-way encroachments that can be seen during a drive-by patrol. These inspections shall include all overhead lines and other accessible equipment.

C. Detailed Facility Inspections

1. Existing lines shall be carefully inspected on a cyclical basis to ensure all associated equipment, hardware, right-of-way, and structures are thoroughly examined.

2. Maximum cycle length for distribution and transmission lines (under 200 KV) shall not exceed ten years. For older lines (25 years or more) and lines with special concerns, a more frequent inspection may be appropriate

3. These inspections are intended to identify NESC violations, defects, and deterioration of facilities which must be corrected in order to maintain safe and reliable service into the future.

4. Detailed facility inspections shall include:

   (a) Overhead and underground transmission and distribution lines up to the point of ownership transfer at the customer service.

   (b) Pole inspection, testing and treating of primary poles, stub poles, overhead guy poles, push pole braces, secondary poles owned by UEC, and meter loop poles owned by UEC. See UEC's pole testing and treating standard for detailed requirements.

103. INSPECTION FREQUENCY

A. Inspection intervals are based on RUS and Oregon PUC requirements and recommendations along with consideration for age and condition of lines, inspection and maintenance history, soil and environmental conditions, weather, quality of line materials, workmanship and design.

B. New, rebuilt, or repaired construction shall be inspected by line personnel before equipment is energized.

C. A public safety inspection shall be completed every two years.

D. Detailed facility inspections shall be completed on a ten year cycle.

E. As part of the detailed facility inspections, certain poles shall be tested for decay. All poles shall be tested at least once after they have been in service for between twelve and fifteen years. Subsequent re-inspections for signs of decay shall occur at intervals no greater than fifteen years.

104. INSPECTION RESPONSIBILITIES

A. The Operations Manager shall be responsible for carrying out the provisions of this standard and making recommendations for changes required.

B. The Operations Manager shall produce a written plan documenting the specific line inspection, line patrol and pole test and treat work scope for the calendar year. He (she) shall also be responsible for maintaining records necessary to ensure accurate and timely progress reports can be made and that annual line inspection and patrol objectives are met.

C. The Line Crew Foreman, Lead Lineman or other designated employee in charge of construction of each new, rebuilt or repaired facility is responsible for verifying NESC compliance before the facilities are placed into service.

D. A licensed professional engineer employed by UEC or an outside contractor designated by UEC shall be responsible for performing field inspections of recently completed construction projects to ensure NESC compliance. It is intended this responsibility will be satisfied by UEC's adherence to the work order inspection program in compliance with RUS requirements.

105. INSPECTION PERSONNEL

A. Inspections shall be conducted by qualified personnel who have an extensive practical knowledge of the NESC and UEC's construction standards. UEC will provide training to employees involved in the inspection process to ensure only qualified employees are used to complete inspections and patrols.

B. UEC may employee the services of qualified outside inspection contractors. Contractors shall be required to submit a statement of qualifications for their company and for each technician assigned to perform inspection work for UEC.

106. DOCUMENTATION

A. UEC shall maintain system maps which illustrate the following:

1. Scope of public and detailed facility inspections planned for the current calendar.

2. Progress made toward completion:

(a) current calendar year inspection objectives.

(b) two-year public safety inspection cycle.

(c) ten-year detailed facility inspection cycle.

B. All inspections shall be performed using UEC's standard forms and/or UEC approved electronic data gathering methods. The following information shall be noted regardless of the methods used:

1. Type of inspection (public safety or detailed facility)

2. Name of inspector

3. Inspection unit identification (circuit, township and range)

4. Date inspections are performed.

C. All locations inspected must be uniquely identified using UEC's standard grid number as the reference. The nature of any deficiencies found along with the inspector's comments shall be provided for each unique location. Standard deficiency codes shall be used to ensure consistent statistical reports can be developed in support of corrective action planning.

D. Certain deficiencies may be corrected by the inspector at the time of the inspection but only when it is safe to do so and the inspector has been given advanced authorization by UEC management.

E. Deficiencies requiring follow up work effort shall be corrected through the use of UEC's service order (a.k.a. job ticket) system. Target completion dates for corrective actions shall be assigned using the priority coding system established as part of UEC's operations and maintenance work request system. Inspectors shall assign a priority code to the service order which shall be reviewed and confirmed by UEC's General Foreman or Operations Manager. Service order numbers shall be cross referenced to each location where a deficiency was found to ensure corrective actions are taken in a timely manner.

F. UEC shall use queries and reports derived from the service order system to ensure deficiencies found during line inspection and patrol are corrected in a timely manner.

107. QUALITY ASSURANCE

A. UEC's Compliance Manager or designated Supervisor shall perform at least an annual quality assurance check of the line inspection program to ensure that inspections, record keeping, and repairs are being properly conducted. A written report shall be produced and filed.

B. Quality assurance checking shall include:

1. 10% of the new and repaired installation inspections

2. 5% of public safety inspections

3. 5% of the detailed facility inspections

108. INSPECTION PROCEDURES

A. To facilitate efficient and complete inspection of distribution and transmission lines the following guidelines shall be used:

1. Distribution Line Inspection Units

(a) Where distribution lines are sourced from more than one substation detailed facility inspections shall be accomplished by generally considering the portion of each circuit within a specific township and range as one unit.

(b) Where distribution lines are sourced from a single substation the entire circuit shall be considered one unit even if the circuit traverses multiple township and range boundaries.

2. Transmission Line Inspection Units

(a) Transmission lines shall be inspected in units characterized by substation and/or 115 kV switch terminal designations.

(b) Transmission line inspection data shall be recorded independently from distribution lines even in cases where distribution circuits are under built on the transmission structures. Transmission lines 200 KV and above shall be considered one unit.

B. Public safety inspections

1. Public safety inspections shall include all overhead lines and portions of the underground system that can be viewed during a patrol of the lines with an emphasis on identifying obvious and immediate hazards, clearance problems and right-of-way encroachments. Patrols will generally be conducted from a vehicle but may require inspectors to walk to some locations in cases where terrain is difficult or access is limited.

2. Hazard identification shall generally focus on:

(a) Ensuring minimum clearances are maintained between lines and ground and between lines and other wires, cables, objects or structures.

(b) Obvious utility space encroachments by cable television, telephone or other joint-users.

(c) Tree limbs and/or vegetation within the allowable clearance area around lines.

(d) Unauthorized attachments on poles such as yard lights and signs.

(e) Obvious equipment damage or defects such as broken insulators, bent or broken hardware, missing brackets and other components, stranded conductors, leaning poles and slack down guys.

(f) Deteriorated facilities such as rusted off anchors and rotten or split cross arms and poles.

(g) Bird nests.

(h) Pad mount equipment problems such as:

(i) missing padlocks, penta-head bolts, or warning signs,

(ii) exterior damage or corrosion of equipment enclosures or evidence of oil leaks,

(iii) washout, excavation or earth settling around equipment,

(iv) physical encroachments in prescribed working space around equipment (landscaping, fences or permanent structures) or any other unsafe public use of equipment.

C. Detailed facility inspections

1. Detailed facility inspections are intended to be more thorough than public safety inspections with individual lines, poles and associated equipment being viewed from very close proximity. In selected instances the scope of inspections may include specific physical measurements and material or equipment testing.

2. In addition to an external visual inspection of all pad-mounted equipment, detailed facility inspections require an internal inspection of all pad-mounted switchgear.

3. Digital photography should be used in order to facilitate planning of repair work and record inspections.

4. Inspectors shall verify the following:

   (a) station or pole numbers (grid numbers),

   (b) equipment inventory and ratings,

   (c) pole size, class and wood type,

   (d) last pole treatment type and date,

   (e) line and transformer phasing.

5. Overhead lines shall be inspected for:

   (a) NESC violations and non-conformance to RUS construction standards. This includes all primary, secondary and service conductors.

      (i) Clearance of lines over roads, highways and driveways shall be measured at the lowest point with conductor size and type, ambient temperature and span length noted. Clearances of joint user cables, wires, and number of contacts shall also be noted.

   (b) broken, chipped or contaminated insulators, loose hardware, loose or broken guys, missing guy guards, loose or broken ground wires, leaning poles considered to be unsafe, loose or broken tie wires, split, broken or loose cross arms, other physical damage, bird nests, and tree or vegetation trimming needs,

   (c) conductor annealing, fraying or burning,

   (d) conductor spans with more than one sleeve or splice in any one phase or sleeves close to or on an insulator,

   (e) slack conductors or unequal conductor sag, undersized jumpers in main line circuits, damaged or burned connectors or jumpers, bare services,

   (f) transformer oil leakage or tank discoloration, bulged or discolored capacitor units, broken or cracked apparatus bushings or fuse holders, insulator tracking, surge arrester failures, switches out of adjustment or needing repair, blown primary or secondary fuses,

   (g) broken, inoperative or malfunctioning street lights.

6. Pole Inspections

(a) In addition to general line inspection requirements, all wood poles shall be inspected to look for pole conditions requiring maintenance and/or replacement. See UEC's pole testing and treatment standard for specific details regarding inspection methods, evaluation criteria, and approved treatment processes.

(b) Wood poles shall be given the following inspections until either rejected or fully treated which ever occurs first.

(i) Above ground line visual inspection.

(ii) Below ground line inspection using partial or full excavation, sound and bore techniques.

(c) Visual Inspection

(i) Inspector shall look for lightning and/or fire damage, surface rot, vandalism, unauthorized attachments, climbing space violations, indication of excessive vehicular contact, washout or excavation around pole and/or anchors, and other structural damage.

(ii) Poles shall be considered unserviceable and rejected for treatment when one or more of the following conditions are found to be excessive: structural damage by lightning or mechanical causes, splitting, insect, bird, or animal damage, external decay or shell rot.

(d) Below Ground Line Inspections

(i) Inspectors shall verify all wood poles have been inspected, tested and treated for rot at least once prior to fifteen years of service. Subsequent inspections for rot shall be performed at intervals no greater than fifteen years.

(ii) Since the detailed facility inspection cycle will place an inspector at a pole every ten years, each pole must be evaluated to ensure the fifteen year maximum cycle for initial and subsequent below ground line inspections is met.

(e) Poles less than fifteen years old that have been physically damaged or have been set in an area where ground conditions are conducive to early rot (poles set in irrigated yards or fields or where standing water is present some time during the year) should be closely scrutinized for below ground inspection and testing along with possible remedial treatment well before fifteen years of service.

7. Pad Mounted Equipment shall be inspected for:

(a) complete and functioning recessed penta-head bolt and door locking mechanisms, including padlock,

(b) exterior damage to enclosure or excessive corrosion,

(c) evidence of oil leaks,

(d) warning signs on the exterior meeting ANSI Z535 standards,

(e) washout, excavation or earth settling around equipment,

(f) physical encroachments in prescribed working space around equipment (landscaping, fences or permanent structures) or any unsafe public use of equipment or grid number plates.

(g) pad mounted switchgear shall also be inspected internally for:

(i) presence of secondary barriers and "Danger" signs,

(ii) general appearance and cleanliness,

(iii) presence of readable and accurate cable identification,

(iv) absence of obvious contamination of insulating surfaces,

(v) adequate grounding and bonding,

(vi) animal intrusion and associated damage,

8. Underground cable shall be inspected for:

(a) damaged riser conduits, unsupported cable in risers or inadequate conduit supports,

(b) physical damage to exposed sections of cable or terminations or indications of oil or compound leaks on cable terminators,

(c) proper shield or concentric neutral bonding and grounding,

(d) signs of concentric neutral corrosion (from a practical standpoint these inspections are most effective if repair crews will identify signs of corrosion at the time cable faults are repaired),

(e) damaged or isolated surge arresters.

109. ONGOING EMPLOYEE AWARENESS

A. UEC employees shall constantly be alert in the course of their daily work to observe conditions that may create a hazard for line workers or the public. Defect reporting and correcting should be a continuous undertaking by the operations and construction personnel.

B. To ensure consistent and complete defect reporting, UEC operations and construction personnel shall use standard operations & maintenance service order request forms to record details related to an observed deficiency. Forms shall be submitted for processing by returning them to the designated repository in the lineman's room or the operations department in box.

CASE: PCN 1
WITNESS: SCOTT GIBBENS

PUBLIC UTILITY COMMISSION
OF
OREGON

STAFF EXHIBIT 204

Exhibits in Support of
Cross-Answering Testimony

November 10, 2016

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 9: Please refer to UEC/102, Toth/2, what are the exact lengths of the primary and two alternatives routes?

Response

The length of the routes are as follows:

Primary: 4.71 miles
West Alternative: 4.78 miles
East Alternative: 6.00 miles

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth

UMATILLA ELECTRIC COOPERATIVE

Oregon Public Utility Commission
Docket No. PCN-1

PUC Staff DR 10: For the proposed five-mile line as well as each of the two alternative routes, how many miles, per route, are *not* planned to use existing transmission corridors?

Response

The proposed line route is the only one of the three alternatives that utilizes an existing transmission corridor the length of the route with one minor exception at a road crossing. 2.9 miles of the West Alternative do not use existing transmission corridors. 4.8 miles of the East Alternative do not use existing transmission corridors.

Response Date: October 11, 2016

Witness Most Knowledgeable About Response: Louis S. Toth