



September 30, 2008

Docket AR 528  
Filing Center  
Oregon PUC  
PO Box 2148  
Salem, OR 97308-2148

Dear Judge Kirkpatrick:

Oregon Trail Electric Consumers Cooperative (OTECC) offers the following response to the most recent public hearing (August 26, 2008) covering the proposed one-year extension of the 2007 National Electrical Safety Code (NESC) Rule 410 – Arc Flash Study and Mitigation.

The public hearing inspired many participants to elaborate on concerns, both for and against, the January 1, 2009 implementation of the NESC Rule 410. Likewise, Commissioners posed valid concerns in the event that the rule is not implemented. All parties, however, had one obvious specific motivation. Employee safety was the singular priority of all parties at the hearing, and that was a very important commonality. Ulterior motivations appeared to be absent from this hearing. With that same spirit in mind, OTEC would like to reiterate comments we made at the hearing.

The NESC is a code book written to provide a guide to all utilities and leaves little or no room for misinterpretation. In fact, this code is the collaboration of many industry experts resulting in excruciatingly specific detail at times. This detail helps provide a minimum standard that all utilities must comply with. For example, the NESC offers exact distances measured in fractions of feet/meters that electric lines must be built away from grain bins, buildings, balconies, roadways, swimming pools, bodies of water able to support watercraft and so forth. Not only are there minimum distances for each aforementioned scenario provided, they are further broken down into more detailed classifications based on the voltages of the lines with corresponding distances from each obstacle dependent upon voltage categories. The end result is a clear set of standards by which all electrical lines must be built. The driving force behind these specific standards is worker and pedestrian safety.

With the proposed NESC Rule 410 Arc Flash Study and Mitigation standard, there are no clear guidelines to follow. With all other rules within the NESC, the safety standards are universally applied no matter which utility system is observed. Electric lines in Colorado or Wyoming are

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built to the same code as lines in Oregon or Vermont. The lines are all built according to the NESC minimum standards. That will not be the case with the Arc Flash standards.

The main reason for the inevitable differences in application by individual utilities is that utilities must perform mathematical calculations to determine the hazards at any and all physical locations on an electrical system. We cannot simply refer to a rule or chart in the NESC as with other measurements to determine the hazards. If one calculation was used by all affected utilities, no problem would exist. At the present time, unfortunately, at least five different types of calculations are used to determine the available energy (measured in calories, or heat) in the event of an electrical arc flash.

At OTECC, our engineers have applied the different calculation methods at the same pinpointed location on our system, and the summations have varied up to 1,500 percent! Consistency cannot be expected with this difference in calculation and corresponding development of flame retardant clothing and/or protective measures. Without consistency by all utilities, employee safety will vary based on the type of calculation a given utility chooses to apply. This certainly does not meet the intent of the code to protect uniformly. Electric utilities persevere to operate at or above "industry best practices." The inconsistencies that the variety of calculations will result in dissolve the benchmark of best practices. Simply, the protection a worker receives will vary significantly based on which utility he or she works for and which calculation was used by that utility to determine the protection required. Luck of the draw certainly is not the intent of any code book.

Another critical question posed by a commissioner at the hearing that must be answered is, "If we do not implement the proposed standards, what safeguards are currently in place to protect workers from arc flashes?" The answer is simple, but lengthy.

Oregon has the benefit of having a state-specific occupational safety and health administration. The Oregon Occupational Safety and Health Administration (OR-OSHA) is active in the creation of rules governing the electric utility industry which supersede the federal rules because they provide a greater level of worker protection. One of the most significant rules that OR-OSHA has implemented is the exclusion of rubber-gloving most high voltage lines. In nearly every state except Oregon, the practice of having linemen work on high-voltage lines using rubber gloves is the norm. When this work is done, the lineman stands in a bucket truck and holds the energized lines in his or her hands which are covered by insulated rubber gloves. In the event of an unforeseen arc flash, the lineman is in the immediate vicinity of the heat generated and at great risk due to minimal distance separation.

The arc flash calculation required by Rule 410 and corresponding caloric exposures is the product of a three-part equation. The first variable is the available energy at the site on the

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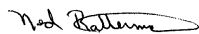
electric system based on the voltage, substation location and transformer size. The second variable is the duration of the flash based on the breaker or fuse operation—how long the flash lasts. The last variable is distance from the flash. Is the worker holding the wire in his hands, or is he not in close proximity to the heat? It is in the third variable that Oregon workers currently benefit from the OR-OSHA rubber glove rule.

When linemen work on high-voltage lines in Oregon they are using “hot sticks.” These tools are eight-foot fiberglass-insulated square rods that have attachments connected to their ends which mimic the human hand. The two advantages of using hot sticks are that they are insulated and they place the worker much farther away from the lines and any possible arc flashes.

The NESC offers one possible method for determining the arc flash hazards. In this calculation model, the distance used to calculate the available energy is 15 inches from flash to worker. This is used because most frequently linemen across the nation utilize the rubber-glove method and are, therefore, in close proximity to the arc flash. When our linemen in Oregon use the eight-foot insulated hot sticks they are trained to hold the last 2-3 feet of the tool when working on high-voltage lines. Consequently, Oregon linemen are 60-72 inches away from a possible arc flash. This additional distance is at least 400 percent farther away than the default method used in the NESC charts of 15 inches. Considering the distance as 1 of only 3 variables in the calculation determining the caloric exposure, Oregon linemen are currently protected by our present OSHA regulations to a large degree. In answer to the Commissioner’s question, the current safeguard Oregon linemen work under is the benefit of significant distance from a possible arc flash.

OTECC would like to ask that you concur with the Commission in the delay of the implementation date of Rule 410 until January 1, 2010. It is our hope that the development of a consensus standard will surface to ensure that all utilities use the most appropriate method for determining arc flash hazard analyses. Further, we would also like the extension to be able to perform many types of calculations to determine the most safe work policies and practices going forward in concert with the code. Individually, we have the challenge of creating new work practices, engineering safeguards in substations, developing a flame retardant program and training employees based on our arc-flash analyses after a consensus is reached.

Thank you for your consideration,



Ned Ratterman  
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