

not providing this information, contractors already are using these methods when determining the size of grounds necessary under existing § 1910.269(n)(4)(i) ("Protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.") There is no evidence in the record that utilities are currently providing unduly conservative estimates of fault current or clearing times to contractors for the purposes of existing § 1910.269(n)(4)(i), and it seems unlikely that they would provide different estimates after this final rule becomes effective. Consequently, the Agency concludes that the concerns specific to contractors are baseless.

Several commenters suggested that proposed paragraph (g)(2) was too vague. (See, for example, Exs. 0126, 0152, 0227; Tr. 1095–1097.) For instance, Ms. Jean Thrasher with Community Electric Cooperative commented: "With undefined terms in the equation and no firm guidelines from OSHA the employer has the potential to be cited even though they performed a good faith appraisal but the inspector disagreed with the values chosen" (Ex. 0152).

OSHA made it clear in this preamble and in Appendix E to final Subpart V that the employer is free to choose any method for estimating incident energy that results in a reasonable estimate of incident heat energy to which the employee would be exposed. Appendix E provides guidance on how to estimate incident heat energy and information on approaches that OSHA will recognize as reasonable for performing these estimates. In the final rule, OSHA revised Note 1 to paragraph (g)(2) to further clarify what constitutes compliance with that paragraph. The revised note provides that: (1) OSHA will deem employers that follow the guidance in Appendix E to be in compliance with paragraph (g)(2), and (2) employers can choose another method of estimating incident heat energy if the chosen method reasonably predicts the incident energy to which the employee would be exposed. (Note 1 in the proposal simply referred to the appendix for guidance.) Employers can rely on the guidance in this preamble and final Appendix E to select methods and input parameters accepted by OSHA for compliance with final paragraph (g)(2). Accordingly, the Agency concludes that paragraph (g)(2) in the final rule is not unenforceably vague.

Proposed paragraph (g)(2) would have required employers to make "a

reasonable estimate of the maximum available heat energy to which the employee would be exposed." OSHA concludes that this language might not accurately convey the purpose of the proposed rule and, therefore, could confuse the regulated community. For example, as should be clear from the foregoing explanation of what OSHA will consider a "reasonable estimate," the Agency believes that it is reasonable to estimate incident-energy exposures based on the location where an employee is reasonably expected to be working when an arc occurs. However, as explained earlier, the maximum heat energy will occur within the arc plasma, and the Agency concludes that it is not necessary to estimate heat energy assuming that the employee is close enough to the arc to be within the plasma field. In addition, as explained previously, the choice of methods and other input parameters also can affect the calculated incident energy. To clarify that the Agency is expecting a reasonable estimate, and not an estimate of the maximum heat energy, OSHA replaced the phrase "a reasonable estimate of the maximum available heat energy" in paragraph (g)(2) in the proposed rule with "a reasonable estimate of the incident heat energy" in the corresponding provision in the final rule. The Agency believes that the final rule more accurately reflects the purpose of this provision and will clarify some of the confusion related to the requirement to estimate incident-energy levels.

NIOSH stated that arc warning labels would be valuable for new or upgraded installations (Ex. 0130). NIOSH explained its position as follows:

Arc warning labels that explain the voltage, available fault current, Arc Hazard Category, the ATPV of the required protective clothing, and the approach distances would be a valuable addition to all new or upgraded installations. Such information, as calculated by the systems' designers, would then be readily available to the workers who need to maintain such systems. Many commercial power systems analysis packages can automatically generate these labels as part of the systems design and analysis procedure. Having labels on new equipment would eliminate the need for the employer to estimate arc hazards by providing calculated engineering data. *[id.]*

OSHA decided against requiring arc-hazard warning labels such as those recommended by NIOSH. OSHA believes that the employer can effectively provide information on arc hazards and the required protective measures in other ways. Employers must train their employees in the recognition of electrical hazards,

including hazards from electric arcs, and the proper use of PPE, including FR and arc-rated clothing, as required by final § 1926.950(b)(2)(v) and (b)(2)(iv), respectively. The employer can use several methods other than labels to ensure that employees wear appropriately rated protective equipment, including requiring a minimum level of protection that will cover most exposures and including the arc rating on work orders. OSHA believes that these other measures are likely to be more effective than warning labels since they inform the employee of the appropriate rating before the employee arrives at the jobsite. If the employer relies on labels, employees may arrive at the jobsite without properly rated protective equipment. In addition, OSHA does not believe that providing labels on transmission and distribution installations is feasible or effective. It is not possible to label the entire length of a transmission or distribution line, and installing labels at switching points would not prove effective or useful to employees whose work is remote from those switching points. Therefore, OSHA is not adopting the requirement for arc-hazard warning labels recommended by NIOSH.

Prohibited clothing. Paragraph (g)(3), which is being adopted with only minor changes from the proposal, requires the employer to ensure that employees exposed to hazards from flames or electric arcs do not wear clothing that could either melt onto their skin or ignite and continue to burn when exposed to flames or the heat energy estimated under final paragraph (g)(2). This rule is equivalent to existing § 1910.269(l)(6)(iii), although OSHA revised the language to explicitly prohibit clothing that could melt onto an employee's skin or ignite and continue to burn.³⁴³ Final paragraph (g)(3) ensures that employees exposed to electric arcs do not wear clothing presenting the most severe burn hazards.

A note following this provision lists fabrics, including acetate, nylon, polyester, and rayon, that the final rule specifically prohibits unless the

³⁴³ The existing rule prohibits clothing that could increase the extent of injuries to an employee. The Agency interprets this rule as prohibiting clothing that could melt or that could ignite and continue to burn in the presence of an electric arc faced by an employee. (See, for example, Memorandum to the Field dated August 10, 1995, from James W. Stanley, "Guidelines for the Enforcement of the Apparel Standard, 29 CFR 1910.269(l)(6), of the Electric Power Generation, Transmission, and Distribution Standard." This memorandum is available at http://www.osha.gov/pls/oshaweb/ownndisp.show_document?p_table=INTERPRETATIONS&p_id=21878.)