"Performing Arc-Flash Hazard Calculations"

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The early usage of electricity focused on "electric shock" as the major source of injury to electricians and electric system operators during work on or near exposed, and energized electrical wiring and equipment
The period of maximum growth of heavy industry in the USA that occurred from 1960 through 1995 created a demand for increasing the quantity of electrical generation, transmission, distribution and utilization. The intense concentration of electrical energy resulted in high available fault currents. The concentration of available fault current created intense releases of light, noise, heat, pressure, and toxic vapors that could occur right in front of employees who from time to time were required to work on or near exposed, energized electrical wiring and equipment.

Some attempts were made by individuals such as J. R. Dunkie-Jacobs with General Electric, (1972, 1986 & 1987), Ralph Lee with DuPont, (1982), a group of concerned IEEE-IAS-PCIC electrical safety personnel, (R. Jones, D. Liggett, M. Capelli-Schellpfeffer, T. Macalady, L. Saunders, R. Downey, B. McClung, A. Smith, S. Jamil and V. Saporita), who conceived and pioneered high power laboratory "Staged Testing to Increase Awareness of Arc-Flash Hazards in Electrical Equipment".

Following several presentations of "Staged Testing to Increase Awareness of Arc-Flash Hazards in Electrical Equipment", IEEE-P1584 was conceived and Project Approval Request made by the members of IEEE-IAS-PCIC in year 2000 to develop an IEEE Standard 1584 to serve as "Guide for Performing Arc-Flash Hazard Analysis".

The focus of industry on electrical safety and recognition of arc-flash burns as having great significance highlighted the need for protecting employees from all arc-flash hazards. It was determined that not enough arc-flash incident energy testing had been done from which to develop models that accurately represent all the real applications. Sufficient testing was performed in the two year course of preparing the IEEE 1584 "Guide for Performing Arc-Flash Hazard Calculations" to overcome the limitations of the "best available" formulas for calculating the "curable" and "incurable" burn injuries.

Today IEEE 1584™ 2002 "Guide for Performing Arc-Flash Hazard Calculations" is considered to be the official method to determine incident energy and arc-flash hazard distance to which employees could be exposed during their work on or near electrical equipment. It covers the analyses process from field data collection to final results, presents the equations needed to find incident energy and the flash protective boundary, and discusses software solution alternatives. Applications cover an empirically derived model including enclosed equipment and open lines for voltages from 208V to 15 kV and a theoretically derived model applicable for any voltage. Included with the standard are programs with embedded equations, which may be used to determine incident energy and the arc-flash protection boundary.