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Page 38

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SOFTWARE & APPS

GUIDE TO ARC FLASH APPS

Simple solutions for fast and accurate results

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Arc flash applications are increasing in popularity among engineers and electricians when examining hazards presented by an arc flash. Professionals search for accessible tools to help reduce dangers associated with arc flash as well as to assist in selecting adequate personal protective equipment (PPE). Mobile apps for arc flash analysis can be useful for assessing the hazards before working on energized equipment.

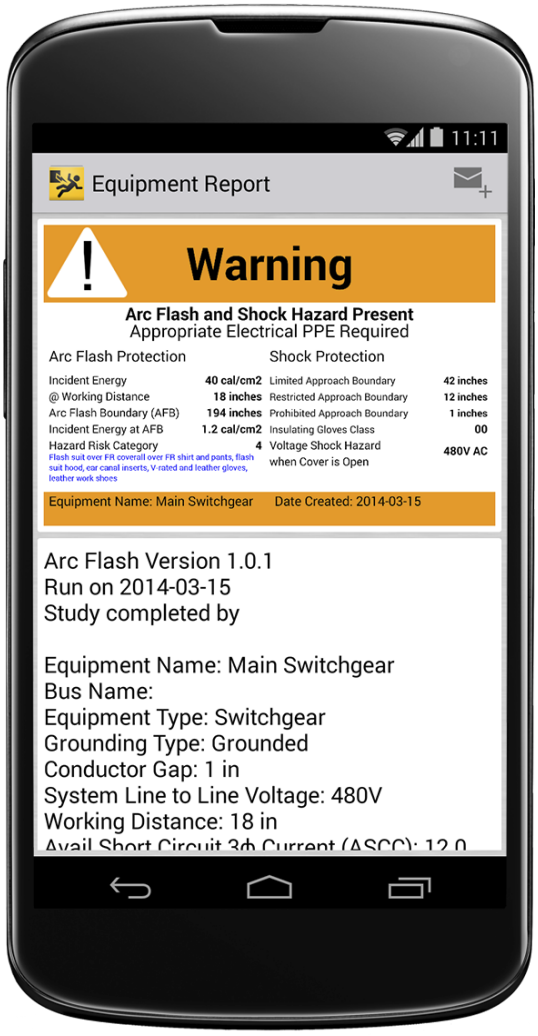
Contrary to many simple and complex computer programs used for power system and arc flash hazard analysis, only a handful of arc flash apps are available for purchase. Each app, available in either the Apple Store (iPhone) or Google Play (Android-operated devices), vary in level of complexity and range of operations.

Q: What are some specific benefits to workers using arc flash apps on their mobile device?

A: Qualified workers use mobile apps for data collection, field analysis of electrical equipment and evaluation of arc flash dangers when access to complex power system analysis computer software is limited or not available. Electrical and safety professionals can now find ways to minimize arc flash hazards using handheld gadgets while in the field by trying different protection device settings and by simulating various fault scenarios.

The apps help in meeting the requirements of CSA Z462 *"Workplace Electrical Safety"* and NFPA 70E: "*Standard for Electrical Safety in the Workplace*" published respectively by the Canadian Standards Association and the National Fire Protection Association. Arc flash mobile apps support calculations and functions for typical distribution systems that use fuses and circuit breaker protection devices. They provide for real-time display of incident energy and arc flash boundary results.

Q: What are some of the common functions of arc flash apps for mobile devices?



A: Primarily, qualified workers and facility owners use arc flash analysis mobile apps for selecting the PPE necessary to protect against thermal energy generated during arcing fault. A typical mobile app for arc flash hazard analysis calculates incident energy, arc flash boundary, determines shock approach boundaries, and provides with PPE recommendations based on system parameters such as equipment type, system voltage, gap between conductors, the amount of available short circuit current, arc duration and working distance. Calculations results displayed on a device screen alert

the user about the danger present when working on energized equipment.

Q: What are some of the advanced functions of arc flash apps for mobile devices?

A: Some mobile apps approach, by functionality, the leading-edge software programs for arc flash analysis. These apps are capable of performing analysis using metric and imperial units of measurement, creating arc flash warning labels in English, and a variety of other languages, performing arc flash boundary calculations based on constant or variable incident threshold energy to second-degree burns for bare skin exposure. Advanced mobile apps feature a built-in protection device library and the provision for adding fuse and circuit breaker data including time-current characteristics for the devices not already listed in the library.

Mobile apps are available for free or at a fraction of the cost of an average arc flash software program. Once purchased, users can install the commercial mobile app at no extra cost on multiple mobile devices sharing the same Apple or Google user ID. Finally yet importantly, mobile users are instantly notified when a new app version has been released and can upgrade for free with a single tap on their smartphone or tablet.

Q: What are some of the drawbacks to using arc flash apps? How can users overcome these limitations?

A: Currently, mobile apps are not capable of simulating time-varying currents contributed by inductive loads and generators. Mobile apps built around the IEEE Standard Association's 1584 specification: *"Guide for Performing Arc-Flash Hazard Calculations"* empirical model provide for specifying both the available short circuit current (ASCC) and the amount of ASCC through the protection device.

Using maximum and minimum available short circuit current values for ASCC and the amount of ASCC through protection device results in the worst case incident energy scenario associated with the longest arc duration and the largest energy flux. Hence, the uncertainty in fault current contribution and current decay from all different type and size of motors and generators is effectively rectified.

Complex protective systems feature circuit breakers and relays with zone selective interlocking (ZSI), multiple maintenance mode trip settings, among others. ZSI scheme circuit breakers and relays communicate with each other, securing selective co-ordination between the devices by ensuring that faults are cleared by the upstream protection device nearest to the fault. Additionally, arcing time can be reduced by temporarily setting upstream protective devices to lower instantaneous trip settings during maintenance periods.

Currently existing mobile apps are not yet capable of modeling such systems. However, this drawback can be largely compensated for in mobile apps featuring adjustable arc duration limits by selecting a reasonable time it takes a person to move away from an arc flash.

Available short circuit current values are required for input when performing arc flash analysis using computer software and mobile apps. Some mobile apps are available for short circuit analysis and calculating the prerequisite values, which might be a consideration for complementing arc flash apps.

LAST LOOK

Arc flash mobile apps are continuously increasing in popularity and aim to promote the awareness of hazards presented by arc flash and assist in selecting proper PPE before testing or working on energizing equipment. Consider these apps as a handy alternative to sophisticated software programs and as a tool of choice when accurate and fast results are necessary. ■