

[Email This Letter](#)

23 August 2007

Jeffrey G Gilbert  
PPL Electric Utilities Corp  
2 N 9th Street, GENN 4  
Allentown, PA 18101-1179  
jggilbert@pplweb.com

Re: PC37.96 - Guide for AC Motor Protection

Dear Jeffrey:

I am pleased to inform you that on 22 August 2007 the IEEE-SA Standards Board approved the above referenced project until 31 December 2011. A copy of the file can be found on our website at <http://standards.ieee.org/board/nes/projects/C37-96.pdf>.

Now that your project has been approved, please forward a roster of participants involved in the development of this project. This request is in accordance with the IEEE-SA Operations Manual, Clause 5.1.2i under Duties of the Sponsor which states:

"Submit annually to the IEEE Standards Department an electronic roster of individuals participating on standards projects"

For your convenience, an Excel spreadsheet for your use has been posted on our website at <http://standards.ieee.org/guides/par/roster.xls>. Please forward this list to me via e-mail at [s.hampton@ieee.org](mailto:s.hampton@ieee.org) no later than 20 November 2007.

Please visit our website, IEEE Standards Development Online (<http://standards.ieee.org/resources/development/index.html>), for tools, forms and training to assist you in the standards development process. Also, we strongly recommend that a copy of your draft be sent to this office for review prior to the final vote by the working group to allow for a quick review by editorial staff before sponsor balloting begins.

If you should have any further questions, please contact me at +1 732 562 6003 or by email at [s.hampton@ieee.org](mailto:s.hampton@ieee.org).

Sincerely,

Sherry Hampton  
Administrator, Governance  
Standards Activities  
Phone +1 732 562 6003  
FAX +1 732 875 0695  
Email: s.hampton@ieee.org

CC: c.henville@ieee.org, stds-pes-scc@ieee.org, pkumar@bechtel.com BCC: s.hampton@ieee.org, t.t.lee@ieee.org

**PAR Request Date:** 14 June 2007**PAR Approval Date:** 22 August 2007**PAR Signature Page on File:** Yes**Type of PAR:** Revision to IEEE Standard**Status:** Revision to an Existing IEEE Std C37.96-2000**Root Project:****1.1 Project No.:** **C37.96****1.2 Type of Document:** Guide**1.3 Life Cycle:** Full-Use**1.4 Is this document in ballot now?** No**2.1 Title**

Guide for AC Motor Protection

**3.1 Working Group Name**[Guide for AC Motor Protection Working Group](#)**Working Group Chair**[Kumar, Prem](#)

Phone: 301-228-7994

Email: pkumar@bechtel.com

**Working Group Vice Chair**[Finney, Dale](#)

Phone: 905-201-2421

Email: dale.finney@indsys.ge.com

**3.2 Sponsor**[IEEE Power Engineering Society Power System Relaying \(PE/PSR\)](#)**Sponsor Chair**[Henville, Charles F](#)

Phone: 604-528-2854

Email: c.henville@ieee.org

**Name of Standards Liaison Representative (if applicable)**[Gilbert, Jeffrey G](#)

Phone: 610-774-4321

Email: jggilbert@pplweb.com

**3.3 Joint Sponsor****4.1 Type of Ballot:** Individual**4.2 Expected Date of Submission for Initial Sponsor Ballot:** December 2010**4.3 Projected Completion Date for Submittal to RevCom:** May 2011**5.1 Approximate number of people expected to work on this project:** 25

**5.2 Scope:** This application guide presents generally accepted methods of protection for ac motors. It identifies and summarizes the functions necessary for adequate protection of motors based on type, size, and application. The recommendations in this guide are based on typical installations. Information relating to protection requirements, including microprocessor based protection systems, applications, and setting philosophy is provided to enable the reader to determine required protective functions for motor installations. Relay protection of squirrel-cage, wound rotor induction motors, and synchronous motors is presented herein. This guide also summarizes the uses of relays and devices, individually and in combination, so the user may select the necessary equipment, to obtain adequate motor protection. This guide is concerned primarily with the protection of three-phase integral horsepower motors and adjustable-speed drives where specifically indicated. This guide does not purport to detail the protective requirements of all motors in every situation. What it does provide is enough information and guidance for the user to implement adequate protection for most applications.

**Old Scope:** This application guide presents generally accepted methods of protection for ac motors. It identifies and summarizes the functions necessary for adequate protection of motors based on type, size, and application. This guide does not purport to detail the protective requirements of all motors in every situation. What it does provide is enough information and guidance for the user to implement adequate protection for particular applications. The recommendations in this guide are based on typical types of installations. However, sufficient background information relating to protection requirements, applications, and setting philosophy is provided to enable the reader to determine required protective functions for motor installation. The protective functions discussed in this guide can also be implemented with multifunction, microprocessor-based protection systems (digital systems). A complete discussion of this type of protection system's attributes is included in this guide. Relay protection of squirrel-cage, wound-rotor induction motors, and synchronous motors is presented herein, with a review of the generally accepted forms of motor protection. This guide also summarizes the uses of relays and devices, individually and in combination, so the user may select the necessary equipment to obtain adequate motor protection. This guide is concerned primarily with the protection of three-phase, integral horsepower motors and adjustable-speed motors where specifically indicated. Its recommendations are of a general nature, designed to cover typical motor installations. Sufficient background information on objectives, application, and setting philosophy is presented. The following outline describes the order in which information is presented in this guide: a) Clause 2 lists applicable references. b) Clause 3 contains a glossary of terminology. c) Clause 4 gives a brief description of the design of induction and synchronous motors. It also discusses various types of switching and control devices used to interrupt low- and medium-voltage motors, and provides schematics that show how these devices are controlled and protected. d) Clause 5 gives a brief description of the damaging effect on a motor of abnormal voltage, current, temperature, and incorrect operating conditions or procedures. A clear understanding of the electrical and mechanical response of the motor to these abnormalities will greatly assist the user in evaluating the need for, and the means of obtaining, adequate motor protection in any situation. e) Clause 6 presents detailed recommendations for good engineering practice in a series of tables and diagrams. The tables and diagrams are classified according to type of switching, normal source voltage, and motor and circuit ratings; they show the combinations of devices normally applied for an associated protective function. See Table 7 for a complete listing of all device designations [both American National Standard Institute (ANSI) and National Electrical Manufacturer's Association (NEMA)] used in this guide. Also included in this clause is application guidance for protection of adjustable-speed drive applications. f) Clause 7 includes a discussion of the various factors that must be considered in determining the setting of each relay, protective function, or device. Whenever it is applicable, information is provided on the desirability of using a device to actuate an alarm or a trip. g) Clause 8 includes a discussion of the important aspects of multifunction, microprocessor-based motor protection systems. Five areas are covered that illustrate the enhancements in functionality and the additional features these types of protection systems provide.

**5.3 Is the completion of this document contingent upon the completion of another document?** No

**5.4 Purpose:** This guide provides users with methods and configurations (schemes) for implementing protection of AC motors. Initiating this revision, is need to cover new technology, applications, and explain further the AC motor characteristics used in setting protective relays.

**Old Purpose:**

**5.5 Need for the Project:** In recent task force discussions of the J subcommittee (Rotating Machinery) of the Power System Relaying Committee (PSRC) it was determined that the present standard should be improved by including features of modern relay technology, better guidance for determining relay settings, and to reflect recent PSRC work on Adjustable speed Drives (ASD) and motor bus transfer applications. Users of this proposed revision will have more tutorial information on motor characteristics that are pertinent to protection, coordination with other motor controlling devices that may contain protection such as fuses, consideration for ancillary equipment such as power factor correction capacitor placement, and examples of relay settings.

**5.6 Stakeholders for the Standard:** utilities, industrial power systems

**6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board? Yes Presented Date:** 2007-05-16

If no, please explain:

**6.1.b. Is the Sponsor aware of any copyright permissions needed for this project? No**

If yes, please explain:

**6.1.c. Is the Sponsor aware of possible registration activity related to this project? No**

If yes, please explain:

**7.1 Are there other standards or projects with a similar scope? No**

If yes, please explain:

**Sponsor Organization:**

**Project/Standard Number:**

**Project/Standard Date:** 0000-00-00

**Project/Standard Title:**

**7.2 Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization? ? Do not know at this time**

**Technical Committee Name and Number:**

**Contact person:**

**Contact person Phone Number:**

**Contact person Email Address:**

**7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety? No**

**7.4 Additional Explanatory Notes:**

Scope has been enhanced to convey the new material that will be covered in this revision.

**8.1 Sponsor Information:**

Is the Scope of this project within the approved scope/definition of the Sponsor's Charter? Yes

If no, please explain: