

PAR for a New IEEE Standard

Section 1

1.1 Assigned Project Number:

1.2 Type of Document: *Recommended Practice*

1.3 Life Cycle: *Trial Use*

Section 2

2.1 Project Title:

Recommended Practice for Continuous Thermal Monitoring of Electrical Infrastructure up to 38kV

Medium Voltage and Low Voltage boundaries are not consistently defined around the world, so staying below a common industry limit for High Voltage listed in the title is the objective here.

Section 3

3.1 Working Group:

Chair: Peter Baen, Consultant | Peter.baen@ieee.org

Vice Chair: Marcelo Valdes, ABB | marcelo.valdes@us.abb.com

Secretary: Shelly DeGrate, Powell | shelly.degrate@powellind.com

3.2 Sponsoring Society and Committee: Industry Applications Society – Petroleum & Chemical Industry Committee (IAS-PCIC)

3.3 Joint Sponsor: Consideration of joint sponsorship with additional IAS Technical Committees and/or Power & Energy Society (PES) has been given, but the project is proceeding solely through IAS-PCIC.

Section 4

4.1 Sponsor Balloting Information: *Individual*

4.2 Expected Date of Submission of Draft to the IEEE-SA for Initial

Sponsor Ballot

Month: May Year: 2022

4.3 Projected Completion Date for Submittal to RevCom

Month: December

Year: 2022

Section 5

5.1 Approximate number of people expected to be actively involved in the development of this project:

15

5.2 Scope of the proposed standard:

The scope of this document is to describe and advise on good practices for implementation of continuous thermal monitoring of power distribution and control equipment implemented below 38kV. Manufacturers of sensors, software, and electrical apparatus with embedded sensing and data handling capabilities are expanding their offerings at a significant rate. This provides users a broad range of options and complexities when considering objectives for these technologies and how to achieve the best return on their investments.

Continuous monitoring of thermal status and the integrity of connections, motors, circuit breakers, switches and other electrical apparatus is increasing in use. Such practices could become the basis of condition-based maintenance practices for enhanced safety for electrical equipment. It is possible that this would be recognized to elevate personnel & equipment safety, increase operating efficiency, and lower costs.

5.3 Is the completion of this standard contingent upon the completion of another standard? No

5.4 Will this document contain a Purpose clause? Yes

This document is intended to help users and facility designers specify and select continuous thermal monitoring systems for their electrical infrastructure up to 38kV. The objective is to describe how to obtain desired performance and allow for future expansion as the available technology and range of related products available in the industry grows.

Continuous thermal monitoring can complement or replace traditional periodic infra-red thermographic surveys. Continuous monitoring is important in the implementation of condition-based maintenance practices and can reduce at-risk and costly down-time for some current inspection practices to

reduce maintenance costs while simultaneously improving reliability and up-time and improve a facility overall.

5.5 Need for the project:

Continuous monitoring can supplant or complement traditional periodic infrared imaging surveys. Continuous thermal monitoring is important in the implementation of condition-based maintenance practices as it can reduce risks during current, often costly, maintenance practices. It can also improve facility safety and reduce maintenance costs while simultaneously improving reliability and up-time.

Current thermal monitoring inspection practices tend to center around the periodic IR Thermographic inspections. However, this practice is under increasing scrutiny because, at best, it only provides partial data points infrequently collected somewhat independent of connected equipment performance.

In an increasingly arc-flash conscious world, the required manual interface with equipment that is often energized is elevating costs and concerns. Standards such as NFPA70E (part 2) which highlights the need for adequate maintenance and NFPA70B currently being changed from a "guide" to a "standard", are increasing economic pressures on organizations. This is particularly challenging in the Oil & Gas industry where margins are already stressed, work forces and equipment are aging and contributing to higher maintenance costs. So the shift from labor intensive maintenance practices to safer, more efficient, less costly data collection with options for automated data collection is being well received.

5.6 Stakeholders for the standard:

The stakeholders for the standard will consist of facility owner/operator companies, Consulting Engineering firms, electrical equipment manufacturers, and 3rd party testing and certification companies. All should benefit from the development and application of the proposed standard, as will the workers with the responsibility for maintaining and testing electrical infrastructure on a routine basis. NFPA 70B is being revised to be a standard and the Condition-based Monitoring that is described therein could use the proposed document for reference to alternatives to present practices.

Section 6

6.1 Intellectual Property:

- A. **Is the Sponsor aware of any copyright permissions needed for this project?** *No*
- B. **Is the Sponsor aware of possible registration activity related to this project?** *No*

Section 7

7.1 Are there other standards or projects with a similar scope? *Yes*

NFPA70B Recommended Practice for Electrical Equipment Maintenance 2019 Edition section 11.17.5.2 states that: "Infrared surveys should be performed during periods of maximum possible loading, but not less than 40 percent of rated load of the electrical equipment being inspected."

While the intent of the NFPA 70B document (and its sister document NFPA 70E) is to increase assessment of the equipment under operating conditions, the procedures for infrared surveys could be inviting increased risks. Personnel exposure to energized equipment is significantly reduced and the accuracy of fixed sensors is being confirmed for improved safety and predictive maintenance for increased reliability.

Sponsor Organization: NFPA

Project/Standard Number: NFPA70B

Project/Standard Date: 2019 Edition

Project/Standard Title: NFPA70B Recommended Practice for Electrical Equipment Maintenance

7.2 Joint Development - Is it the intent to develop this document jointly with another organization? *No*

7.3 International Standards Activities

- A. **Adoptions - Is there potential for this standard to be adopted by another organization?** *Yes*

If yes, please indicate the organization, technical committee name/number and contact person within external organization

Organization: IEC (Potentially. Nothing known to exist at this time.)

B. Harmonization - Are you aware of another organization that may be interested in portions of this document in their standardization development efforts? No

7.4 Does the sponsor foresee a longer term need for testing and/or certification services to assure conformity to the standard? No

Section 8

8.1 Additional Explanatory Notes:

None

8.2 IEEE Code of Ethics

I acknowledge that I have read and I understand the [IEEE Code of Ethics](#)

I agree to conduct myself in a manner that adheres to the IEEE Code of Ethics when engaged in official IEEE business.