

ANSI/NETA ECS-2020

**STANDARD FOR
ELECTRICAL COMMISSIONING
SPECIFICATIONS** for Electrical Power Equipment
and Systems

Secretariat
NETA (InterNational Electrical Testing Association)



Approved by
American National Standards Institute



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Published by
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3. Qualifications
4. Division of Responsibility
5. General

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FOREWORD

(This Foreword is not part of American National Standard NETA ECS-2020)

The InterNational Electrical Testing Association (NETA) was formed in 1972 to establish uniform testing procedures for electrical equipment and systems. NETA has been an Accredited Standards Developer for the American National Standards Institute since 1996. NETA's scope of standards activity is different from that of IEEE, NECA, NEMA, and UL. In matters of testing electrical equipment and systems NETA continues to reference other standards developers' documents where applicable. NETA's review and updating of presently published standards takes into account both national and international standards. NETA's standards may be used internationally as well as in the United States. NETA firmly endorses a global standardization. IEC standards as well as American consensus standards are taken into consideration by NETA's ballot pools and reviewing committees.

The ANSI/NETA *Standard for Electrical Commissioning Specifications for Electrical Power Equipment and Systems* is the most current revision of this document and was approved as an American National Standard on September 9, 2019.

The ANSI/NETA *Standard for Electrical Commissioning Specifications for Electrical Power Equipment and Systems* should be used in conjunction with the most recent edition of ANSI/NETA *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*. Together, these standards provide the necessary specifications to test and commission electrical power equipment and systems. Furthermore, the NETA standards should be used together with other commissioning documents to expand the scope to include all of the applicable systems. Other systems may include mechanical, instrumentation, heating and refrigeration, and building systems.

The ANSI/NETA *Standard for Electrical Commissioning Specifications for Electrical Power Equipment and Systems* was developed for use by those responsible for testing and commissioning newly installed or retrofitted electrical power systems and equipment to guide them in specifying and performing the necessary inspections, tests, measurements, and system performance verifications to commission an electrical power system infrastructure. This document aids in ensuring safe, reliable operation of the electrical power equipment and systems. It is essential to commission newly installed and retrofitted electrical power equipment and systems. Additionally, acceptance testing of the equipment provides the baseline test results for maintenance programs and equipment trending, while commissioning verifies the electrical equipment and system meets the owner's project requirements and basis of design.

PREFACE

(This Preface is not part of American National Standard NETA ECS-2020)

It is recognized by the Association that the term "commissioning" is not well defined in the industry. Although there are documents that exist in reference to commissioning, no standards exist that specifically address commissioning electrical power systems. It is the intent of this document to better define and specifically address the critical elements and requirements necessary in the commissioning of low-, medium-, and high-voltage electrical power systems.

The ANSI/NETA ECS *Standard for Electrical Commissioning Specifications for Electrical Power Equipment and Systems* is intended for use in all industries, whether it is a data center, a utility substation, an industrial facility, or any location that requires a comprehensive electrical power system commissioning process.

Suggestions for improvement of this standard are welcome. They should be sent to the InterNational Electrical Testing Association, 3050 Old Centre Road, Suite 101, Portage, MI 49024.

To help the user better understand and navigate more efficiently through this document, the following information is offered:

Notation of Changes

Material included in this edition of the document but not part of the previous edition is marked with a black vertical line in the outside margin.

Document Structure

The NETA ECS is divided into eleven separate and defined sections.

| | |
|------------|--|
| Section 1 | General Scope |
| Section 2 | Applicable References |
| Section 3 | Qualifications |
| Section 4 | Division of Responsibility |
| Section 5 | General |
| Section 6 | Commissioning Process |
| Section 7 | Inspection and Commissioning Procedures |
| Section 8 | Prime, Emergency, and Standby Power Systems (RESERVED) |
| Section 9 | Thermographic Survey |
| Section 10 | Transfer to Owner/Operator |
| Appendices | Various Informational Documents |

Section 7 Structure

Section 7 is the main body of the document with specific information on what to do relative to the inspection and commissioning of electrical power equipment and systems. It is not intended that this document explain how to test specific pieces of equipment or systems, but rather, to detail the required steps and procedures for comprehensive commissioning of electrical power systems at a given voltage class.

Section 7 is divided into three subsections (7.1, Low-; 7.2, Medium-; and 7.3, High- and Extra-High Voltage Systems), which are in turn divided again into three subsections (A. Pre-Energization, B. Energization, and C. Post Energization).

PREFACE (*Continued*)

If/When Applicable

The phrases "if applicable", "when applicable", and any variation thereof do not occur in this standard. This standard assumes that if devices or pieces of equipment are not present, they will not be subject to testing or verification.

Manufacturer's Instruction Manuals

It is important to follow the recommendations contained in the manufacturer's published data. Many of the details of a complete and effective testing and commissioning procedure can be obtained from this source.

Summary

The guidance of an experienced commissioning professional should be sought to develop a commissioning plan and lead the commissioning team. It is necessary to make an informed judgment for each particular system regarding how extensive a procedure is justified and required. The approach taken in these specifications is to present a comprehensive series of inspections, tests, and verifications applicable to most electrical systems. It is likely that in smaller electrical systems some of the inspections, tests, and verifications can be omitted.

Likewise, guidance of an experienced commissioning professional should also be sought when making decisions concerning the results of test data and performance results and their significance to the overall analysis of the device or system under test. Careful consideration of all aspects of test data, including manufacturer's published data and recommendations, must be included in the overall assessment of the equipment or systems being commissioned.

The Association encourages comment from users of this document. Please contact the NETA office or your local NETA Accredited Company.

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1. GENERAL SCOPE

1.1 Electrical Commissioning Specifications

1. These specifications describe the systematic process of documenting, and placing into service newly–installed, or retrofitted electrical power equipment and systems. This document shall be used in conjunction with the most recent edition of the ANSI/NETA *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems* (ANSI/NETA ATS). The individual electrical components shall be subjected to factory and field tests, as required, to validate the individual components.
2. The purpose of these specifications is to assure that tested electrical systems are safe, reliable, operational, in conformance with applicable standards and manufacturers’ tolerances, and installed in accordance with design specifications.
3. The work in these specifications may involve hazardous voltages, materials, operations, and equipment. These specifications do not purport to address all of the safety issues associated with their use. It is the responsibility of the user to review all applicable regulatory requirements prior to the use of these specifications.
4. These specifications are intended for application on electrical power equipment and systems. It is not the intent of these specifications to provide comprehensive details on the commissioning of mechanical equipment, mechanical instrumentation systems, and related components.