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USACE / NAVFAC / AFCEA UFGS-16081 (August 2004)  
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Preparing Activity: NAVFAC Superseding  
UFGS-16081N (February 2003)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMLR dated 23 June 2005

Latest change indicated by CHG tags.

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### SECTION 16081

#### APPARATUS INSPECTION AND TESTING 08/04

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NOTE: This guide specification covers the requirements for electrical inspection and testing.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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NOTE: Use this specification on project specifications where NETA testing is required.

The following sections reference NETA for power distribution services and equipment.

- Section 16237N SINGLE OPERATION GENERATOR SETS
- Section 16272 THREE-PHASE PAD-MOUNTED TRANSFORMERS
- Section 16273 SINGLE-PHASE PAD-MOUNTED TRANSFORMERS
- Section 16301N OVERHEAD TRANSMISSION AND DISTRIBUTION
- Section 16302N UNDERGROUND TRANSMISSION AND DISTRIBUTION
- Section L-16303N UNDERGROUND ELECTRICAL WORK
- Section 16341N PAD-MOUNTED SF6 INSULATED INTERRUPTER
- Section 16360 SECONDARY UNIT SUBSTATIONS
- Section 16361N PRIMARY UNIT SUBSTATIONS
- Section 16410N AUTOMATIC TRANSFER SWITCHES

--Section 16442 SWITCHBOARDS AND SWITCHGEAR

This section shall also be used for specification sections containing low-voltage or medium voltage generator control switchboards or switchgear, pad-mounted air switches, and medium voltage circuit breakers. Provide the section numbers and titles in this section, and add NETA testing requirements to the applicable section.

Coordinate the sections in your contract documents with this list and with paragraph entitled "Acceptance Tests and Inspection" in PART 3 of this specification.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS (2003) Acceptance Testing Specifications

1.2 RELATED REQUIREMENTS

Section 16050N BASIC ELECTRICAL MATERIALS AND METHODS applies to this section with additions and modifications specified herein.

1.3 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-06 Test Reports

Acceptance tests and inspections; G, [\_\_\_\_\_]

#### SD-07 Certificates

Qualifications of organization, and lead engineering technician; G, [\_\_\_\_\_]

Acceptance test and inspections procedure; G, [\_\_\_\_\_]

### 1.4 QUALITY ASSURANCE

#### 1.4.1 Qualifications

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and generation equipment listed in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment.

The organization shall be a first tier subcontractor. No work required by this section of the specification shall be performed by a second tier subcontractor.

- a. Submit name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS.
- b. Submit name and qualifications of the lead engineering technician

performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

#### 1.4.2 Acceptance Tests and Inspections Reports

Submit certified copies of inspection reports and test reports. Reports shall include certification of compliance with specified requirements, identify deficiencies, and recommend corrective action when appropriate. Type and neatly bind test reports to form a part of the final record. Submit test reports documenting the results of each test not more than 10 days after test is completed.

#### 1.4.3 Acceptance Test and Inspections Procedure

Submit test procedure reports for each item of equipment to be field tested at least 45 days prior to planned testing date. Do not perform testing until after test procedure has been approved.

### PART 2 PRODUCTS

Not used.

### PART 3 EXECUTION

#### 3.1 ACCEPTANCE TESTS AND INSPECTIONS

Testing organization shall perform acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Contracting Officer shall be notified at least 14 days in advance of when tests will be conducted by the testing organization. Perform acceptance tests and inspections on applicable equipment and systems specified in the following sections:

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**NOTE: Select applicable sections for each project.**

**Ensure each equipment section includes the following information. These changes should be found in the Atlantic Division Interim Specification Revision.**

**1. NETA ATS listed in the references.**

**2. The words "and Section 16081N, "Apparatus Inspection and Testing" apply" added to paragraph**

entitled "Related Requirements."

3. SD-06 submittals with "Acceptance checks and tests" added in PART 1.

4. Appropriate paragraphs from the NETA manual added under "Field Quality Control" in PART 3.

5. Add any job section numbers and titles containing low-voltage or medium voltage generator control switchgear or switchboards, pad-mounted air switches, or medium voltage circuit breakers. Provide the NETA tests required in the applicable section.

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[a. Section 16237N SINGLE-OPERATION GENERATOR SETS. Functional engine shutdown tests, vibration base-line test, and load bank test shall not be performed by the testing organization. These tests shall be performed by the start-up engineer.]

[b. Section 16272 THREE-PHASE PAD-MOUNTED TRANSFORMERS]

[c. Section 16273 SINGLE-PHASE PAD-MOUNTED TRANSFORMERS]

[d. Section 16301N OVERHEAD TRANSMISSION AND DISTRIBUTION]

[e. Section 16302N UNDERGROUND TRANSMISSION AND DISTRIBUTION]

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NOTE: LANTNAVFACENGCOM Projects should use  
LANTNAVFACENGCOM Section 16303N UNDERGROUND  
ELECTRICAL WORK.

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[f. Section 16341N PAD-MOUNTED SF6 INSULATED INTERRUPTER SWITCHES]

[g. Section 16360 SECONDARY UNIT SUBSTATIONS]

[h. Section 16361N PRIMARY UNIT SUBSTATIONS]

[i. Section 16410N AUTOMATIC TRANSFER SWITCHES]

[j. Section 16442 SWITCHBOARDS AND SWITCHGEAR]

### 3.2 SYSTEM ACCEPTANCE

Final acceptance of the system is contingent upon satisfactory completion of acceptance tests and inspections.

### 3.3 PLACING EQUIPMENT IN SERVICE

A representative of the approved testing organization shall be present when equipment tested by the organization is initially energized and placed in service.

-- End of Section --