ERS
ELECTRICAL RELIABILITY SERVICES

# Frequency of Maintenance Testing Guide

## Maximize the reliability and efficiency of your electrical assets

As an independent third party company, we are committed to providing objective, unbiased test results and recommendations. As a member of NETA, you are assured that all testing is performed objectively, according to NETA specifications, using calibrated instruments traceable to the National Institute of Standards and Technology (NIST).

Please use this complimentary guide to NETA-recommended maintenance testing frequencies and intervals to maximize the results of your reliability-based testing program. Trust Electrical Reliability Services to deliver the experience and results you can rely on.

### Our Services Include:

- Commissioning and Startup
- Arc Flash Solutions
- Engineering Services
- Predictive Diagnostics
- Preventive Maintenance
- Partial Discharge Testing and Monitoring Solutions
- Smart Turnarounds and Outages
- Retrofit, Renewal, and Replacement Services
- Product Compliance & Conformity Testing
- Project Management
- Educational Services
- Emergency Response Services

Electrical power is the pulse of your facility. It's vital to your operations, but also dangerous and costly. When your electrical assets fail, profits and people can suffer.

In North America, rely on ERS to deliver the most complete solutions for electrical system reliability and safety. From testing for problems that could disable your system, to complete turnaround execution, you'll quickly understand how we are your single source solution for all your electrical reliability needs.

With a network of more than 30 service locations in North America, our experienced professionals are available where and when you need them. We'll help you build reliability programs from the beginning to get your process or plant moving toward maximum capacity and minimal risk of unexpected delays.

# Frequency of Maintenance Tests

The InterNational Electrical Testing Association (NETA) recognizes that the ideal maintenance program is reliability-based and unique to each plant and each piece of equipment. The following schedule is a guide to NETA-recommended testing and maintenance intervals and should be used in conjunction with a qualified maintenance program.

For more than 50 years, Electrical Reliability Services has served as the industry leader providing safe, high quality electrical testing, maintenance, and engineering services to customers nationwide. We are an independent third-party testing company committed to providing objective, unbiased test results and recommendations. As a full member of NETA, you are assured that all our testing is performed objectively, according to NETA specifications, using calibrated instruments traceable to the National Institute of Standards and Technology (NIST).

This Frequency of Maintenance Testing Guide is a useful schedule of testing frequencies that correspond directly with the NETA Standard for Maintenance Testing Specifications. Specific condition, criticality, and reliability must be determined to correctly apply the matrix. Application of the matrix along with use of historical testing data and trending, leads to a quality electrical preventive maintenance program.

## Inspections and Tests

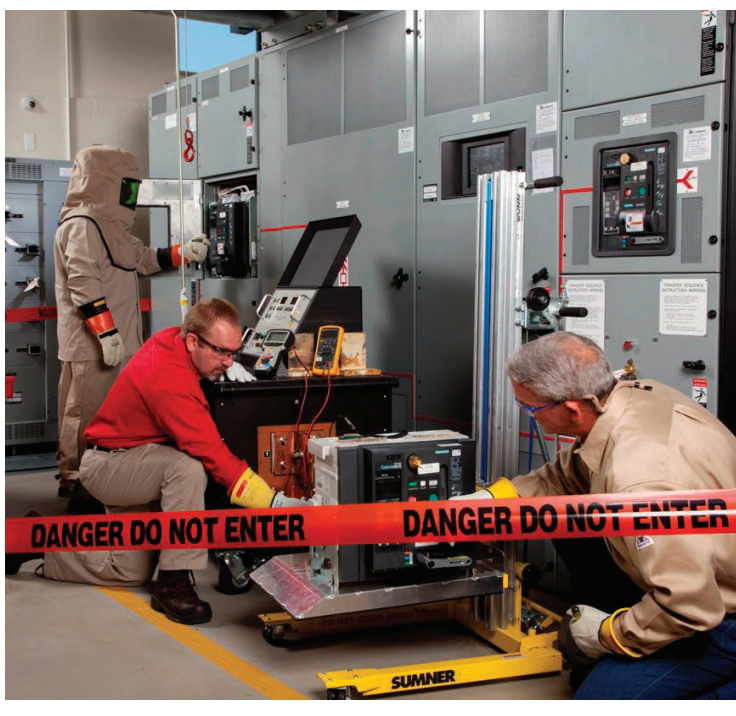
(Frequency in Months)

Multiply the values listed in the table below by the factor in the Maintenance Frequency Matrix located to the right.

### Maintenance Frequency Matrix

| | | Equipment Condition | | |
|---|---|---|---|---|
| | | Poor | Average | Good |
| **Equipment Reliability Requirement** | Low | 1.00 | 2.00 | 2.50 |
| | Medium | 0.50 | 1.00 | 1.50 |
| | High | 0.25 | 0.50 | 0.75 |

| Section | Description | Visual | Visual and Mechanical | Visual, Mechanical, and Electrical |
|---|---|---|---|---|
| 7.1 | Switchgear and Switchboard Assemblies | 12 | 12 | 24 |
| 7.2 | Transformers | | | |
| 7.2.1.1 | Small Dry-Type Transformers | 2 | 12 | 36 |
| 7.2.1.2 | Large Dry-Type Transformers | 1 | 12 | 24 |
| 7.2.2 | Liquid-Filled Transformers | 1 | 12 | 24 |
| | Sampling | - | - | 12 |
| 7.3 | Cables | | | |
| 7.3.2 | Low-Voltage Cables | 2 | 12 | 36 |
| 7.3.3 | Medium and High-Voltage Cables | 2 | 12 | 36 |
| 7.4 | Metal-Enclosed Busways | 2 | 12 | 24 |
| | Infrared Only | - | - | 12 |
| 7.5 | Switches | | | |
| 7.5.1.1 | Air, Low-Voltage Switches | 2 | 12 | 36 |
| 7.5.1.2 | Air, Medium-Voltage Metal-Enclosed Switches | - | 12 | 24 |
| 7.5.1.3 | Air, Medium- and High-Voltage Open Switches | 1 | 12 | 24 |
| 7.5.2 | Oil, Medium-Voltage Switches | 1 | 12 | 24 |
| 7.5.3 | Vacuum, Medium-Voltage Switches | 1 | 12 | 24 |
| 7.5.4 | Medium-Voltage $SF_6$ Switches | 1 | 12 | 24 |
| 7.5.5 | Cutouts | 12 | 24 | 24 |
| 7.6 | Circuit Breakers | | | |
| 7.6.1.1 | Insulated-Case/Molded-Case CB | 1 | 12 | 36 |
| 7.6.1.2 | Air, Low-Voltage Power CB | 1 | 12 | 36 |
| 7.6.1.3 | Air, Medium-Voltage CB | 1 | 12 | 36 |
| 7.6.2 | Oil, Medium-Voltage CB | 1 | 12 | 36 |
| | Sampling | - | - | 12 |
| 7.6.2 | Oil, High-Voltage CB | 1 | 12 | 12 |
| | Sampling | - | - | 12 |
| 7.6.3 | Vacuum, Medium-Voltage CB | 1 | 12 | 24 |
| 7.6.4 | $SF_6$ CB | 1 | 12 | 12 |
| 7.7 | Circuit Switches | 1 | 12 | 12 |
| 7.8 | Network Protectors | 12 | 12 | 24 |
| 7.9 | Protective Relays | | | |
| 7.9.1 | Electromechanical and Solid State | 1 | 12 | 12 |
| 7.9.2 | Microprocessor-Based | 1 | 12 | 12 |
| 7.10 | Instrument Transformers | 12 | 12 | 36 |
| 7.11 | Metering Devices | 12 | 12 | 36 |
| 7.12 | Regulating Apparatus | | | |
| 7.12.1.1 | Step-Voltage Regulators | 1 | 12 | 24 |
| | Sample Liquid | - | - | 12 |
| 7.12.1.2 | Induction Regulators | 12 | 12 | 24 |
| 7.12.2 | Current Regulators | 1 | 12 | 24 |
| 7.12.3 | Load Tap-Changers | 1 | 12 | 24 |
| | Sample Liquid | - | - | 12 |
| 7.13 | Grounding Systems | 2 | 12 | 24 |
| 7.14 | Ground-Fault Protection Systems | 2 | 12 | 12 |
| 7.15 | Rotation Machinery | | | |
| 7.15.1 | AC Induction Motors and Generators | 1 | 12 | 24 |
| 7.15.2 | Synchronous Motors and Generators | 1 | 12 | 24 |
| 7.15.3 | DC Motors and Generators | 1 | 12 | 24 |
| 7.16 | Motor Control | | | |
| 7.16.1.1 | Low-Voltage Motor Starters | 2 | 12 | 24 |
| 7.16.1.2 | Medium-Voltage Motor Starters | 2 | 12 | 24 |
| 7.16.2.1 | Low-Voltage Motor Control Centers | 2 | 12 | 24 |
| 7.16.2.2 | Medium-Voltage Motor Control Centers | 2 | 12 | 24 |
| 7.17 | Adjustable Speed Drive Systems | 1 | 12 | 24 |
| 7.18 | Direct-Current Systems | | | |
| 7.18.1 | Batteries | 1 | 12 | 12 |
| 7.18.2 | Battery Chargers | 1 | 12 | 12 |
| 7.18.3 | Rectifiers | 1 | 12 | 24 |
| 7.19 | Surge Arresters | | | |
| 7.19.1 | Low-Voltage Surge Protection Devices | 2 | 12 | 24 |
| 7.19.2 | Medium-and High-Voltage Surge Protection Devices | 2 | 12 | 24 |
| 7.20 | Capacitors and Reactors | | | |
| 7.20.1 | Capacitors | 1 | 12 | 12 |
| 7.20.2 | Capacitor Control Devices | 1 | 12 | 12 |
| 7.20.3.1 | Reactors, Dry-Type | 2 | 12 | 24 |
| 7.20.3.2 | Reactors, Liquid-Filled | 1 | 12 | 24 |
| | Sampling | - | - | 12 |
| 7.21 | Outdoor Bus Structure | 1 | 12 | 36 |
| 7.22 | Emergency Systems | | | |
| 7.22.1 | Engine Generator | 1 | 2 | 12 |
| | Functional Testing | - | - | 2 |
| 7.22.2 | Uninterruptible Power Systems | 1 | 12 | 12 |
| | Functional Testing | - | - | 2 |
| 7.22.3 | Automatic Transfer Switches | 1 | 12 | 12 |
| | Functional Testing | - | - | 2 |
| 7.23 | Telemetry / Pilot Wire SCADA | 1 | 12 | 12 |
| 7.24 | Automatic Circuit Reclosers & Line Sectionalizers | | | |
| 7.24.1 | Automatic Circuit Reclosers, Oil / Vacuum | 1 | 12 | 24 |
| | Sample | - | - | 12 |
| 7.24.2 | Automatic Line Sectionalizers, Oil | 1 | 12 | 24 |
| | Sample | - | - | 12 |
| 7.27 | EMF Testing | 12 | 12 | 12 |





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