Typical operation and maintenance schedule

NT NER S5.10

PowerWater

Contents

1 Introduction

This maintenance plan is provided as a high level indication of typical maintenance requirements and is based on existing Power and Water Corporation (Power and Water) maintenance plans and strategies developed. In developing maintenance plans and managing assets generally, Power and Water applies the international ISO 55001 standard for asset management system principles and strives for industry best practice in all areas. Aspects of the maintenance plan will vary depending on operating duty and environment and cannot be finalised until the selection, configuration and utilisation of the installed assets is understood. The list of assets below is not exhaustive but reflects the significant proportion of complete asset fleet requiring maintenance. The maintenance activities are planned in a manner to minimise the outages and combining Minor asset maintenance with the more significant asset for efficiency. Not all assets listed below will be required at all sites.

1.1 Version history

Version	Date	Comments
V1.0	1 July 2024	Initial version for publishing

1.2 Disclaimer

This document may be regularly updated. Persons not on a Power and Water distribution list should not assume that this document is the latest version.

The only up-to-date version is located on Power and Water's web site.

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2 Typical maintenance strategies

2.1 Zone substations

Asset class	Maintenance strategy			
Zone substation	Visual inspection: Every month			
	Detailed: Every 3 months			
	Thermographic and partial discharge survey: Annual			
High voltage (HV) circuit breakers (CB) - outdoor		**Oil CB**	**Vacuum CB**	**Gas CB**
	Functional:	Every 2 years	Every 3 years	Every 6 years
	Diagnostic:	Every 4 years	Every 12 years	Every 12 years
	Intrusive:	Every 8 years	NA	NA
	Fault:	Fault Ops	Fault Ops	Fault Ops
HV circuit breakers - indoor		**Oil CB**	**Vacuum CB**	**Gas CB**
	Functional:	Every 2 years	Every 3 years	Every 6 years
	Diagnostic:	Every 4 years	Every 12 years	Every 12 years
	Intrusive:	Every 8 years	NA	NA
	Fault:	Fault Ops	Fault Ops	Fault Ops
Indoor switchboards	Functional: Annual			
	Diagnostic: Every 5 years			
	Intrusive: Every 5 years			
Outdoor disconnectors and busbars	Functional (open/close exercise): Every 2 years			
	Diagnostic: Every 6 years			
Capacitor banks	Functional: Every 6 months			
	Intrusive: Every 5 years			

Asset class	Maintenance strategy
Power transformers	Functional: Annual Dissolved Gas Analysis
	Diagnostic: Every 6 years (>20yrs old), every 12 years (<20 yrs old)
	Intrusive: Every 5 years
Transformer on load tap changers (OLTC)	Diagnostic - Dissolved Gas Analysis: Annual
	Intrusive: As per original equipment manufacturer recommendations for make/model
Transformer bushings (66 kV and above)	Diagnostic: Every 6 years
Instrument transformers	Diagnostic: Every 4 to 6 years based on age and construction type
Earth grids	Functional: Every 5 years
	Diagnostic: Every 10 years
Batteries and chargers	Diagnostic: Annual
	Intrusive: Every 2 years (units >8 years old) or when diagnostic testing indicates an intrusive is required.
Auxiliary systems, buildings, grounds	Functional check of auxiliary systems operation: Annual
	Inspection of structures: Every 5 to 8 years
	Specialist system checks and maintenance: As per manufacturer's recommendations
	Grounds and buildings: Based on asset condition and local environment
Surge arrestors	Monthly visual inspection

Table 1: Zone Substations - Generic maintenance plan

2.2 Transmission lines

Asset class	Maintenance strategy
132kV transmission lines	Ground patrol of the line: Annual
	Aerial patrol of the line: Annual
	Ground based detailed inspection: Every 3 to 5 years*
	Tower climb inspection: Every 6 to 50 years*
66kV transmission lines	Ground patrol of the line: Annual
	Ground based detailed inspection: Every 5 years
	Tower climb inspection: Every 25 years

Table 2:Transmission Line - Generic maintenance plan

**Frequency depends on line criticality and tower accessibility.*

2.3 Protection equipment

Asset class	Maintenance strategy
Protection	Dependent on relay type and circuit voltage. Functional checks at 2, 3, 5 or 6 year intervals. Input output (IO)/Trip checks at 2 or 3 year intervals.
Communications	Communications site inspection including tower and earthing: Every 3 years Remote monitoring of fibre optic and microwave equipment: Every 6 months Fibre testing (spare core integrity): 5 to 10 years Grounds maintenance of communications sites: Every 2 months

Table 3: Protection Equipment - Generic maintenance plan

2.4 Metering

Asset class	Maintenance strategy
Inspections of HV current transformer	> 100 GWh (With check metering): Every 2.5 years > 100 GWh (No check metering): Annual > 10 GWh: Every 2 years
HV current transformer tests	Tests for electronic meters at HV metering installations: Every 5 years Tests for instrument Transformers at high voltage metering installations: Every 10 years

Table 4: Metering - Generic maintenance plan

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