



Network Optimisation Standard for Preventive Maintenance Programs 2015-16 to 2019-20

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Abstract: This document details the preventive maintenance inspection and maintenance intervals and other criteria used to generate the 2015-16 – 2019-20 Maintenance Work Plans and Budget.

Keywords: Preventive, Maintenance, Programs, Annual, Asset Management, Network, Standard



Standard for Preventive Maintenance Programs for 2015-16 – 2019-20

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1 Overview

1.1 Purpose

This document outlines the asset management standards underpinning the Preventive Maintenance Programs and Work Plans with Ergon Energy for the 2015-16 – 2019-20 regulatory control period.

This document is only intended to provide a summary of the Preventive Maintenance Programs and it is not intended to provide justification for why these programs have been adopted. Such justification will be contained within other maintenance documentation such as the Asset Equipment Plans.

Corrective and Forced Maintenance is not covered by this document.

1.2 Scope

This document details the Preventive Maintenance inspection and maintenance intervals and other criteria used to generate the 2015-16 to 2019-20 regulatory control period Maintenance Work Plans and Budget.

The major categories of Preventive Maintenance are as follows:

- Overhead Line Assets
- Underground Line Assets
- Distribution Substation Assets
- Public Lighting Assets
- Vegetation and Access Tracks
- Zone Substations – Primary and Auxiliary Assets
- Communication Assets
- Control System Assets
- Protection Assets
- Metering Assets

2 References

2.1 Ergon Energy controlled documents

Document number or location (if applicable)	Document name	Document type
NA000900R102	Meter Asset Management Plan	Reference
NA000900R103	Meter Asset Maintenance Strategy and Test Plan	Reference
NA000900R104	Instrument Transformer Maintenance Strategy and Test Plan	Reference

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2.2 Other documents

Document number or location (if applicable)	Document name	Document type
Australian Standard	AS1284.13 – In-Service Compliance Testing	Australian Standard
LDCM	Lines Defect Classification Manual	Manual
SDCM	Substation Defect Classification Manual	Manual

3 Legislation, regulations, rules, and codes

This document refers to the following:

Legislation, regulations, rules, and codes
National Electricity Rules – Chapter 7
NEM Metrology Procedures
Queensland Electricity Regulations 2006

4 Definitions, acronyms and abbreviations

4.1 Definitions

For the purposes of this standard, the following definitions apply:

Term	Definition
Minor Distribution Substation	<p>Any substation that takes a distribution voltage and converts it to a LV voltage, and meets all of the following criteria:</p> <ul style="list-style-type: none"> • Does not contain protection or DC system equipment • Does not have a circuit breaker switchgear and/or a switchboard of more than one outgoing feeder • Is not enclosed in an Ergon owned building • Is not a padmount substation • Is enclosed in a building or fence that is deemed to be easy to access for maintenance purposes

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Term	Definition
Major Distribution Substation	<p>Any Ergon owned and managed substation that takes a distribution voltage and converts it to an LV voltage, and meets any one the following criteria (excluding Padmounts):</p> <p>Primary Criteria:</p> <ul style="list-style-type: none"> • Has protection relays or DC system equipment • Is enclosed in an Ergon owned building • Has circuit breaker switchgear, and or a switchboard of more than one outgoing feeder <p>Secondary Criteria:</p> <ul style="list-style-type: none"> • Is enclosed in a non-Ergon owned building and is deemed to be difficult to change or presents other hazards such as fire (i.e. major shopping centres) • Is used to tee in or out distribution voltages. (i.e. 11kV or 22kV) • Is deemed to be a site of interest for some other reason (i.e. close to a creek, environmental hazard, has communications gear) <p>If an asset falls into the Primary Criteria it is defined as a Town Substation, if an asset falls into the Secondary Criteria the Network Maintenance group is required to make a decision as to whether the asset is to be classed as a Town Substation.</p>
Zone Substation	Any substation that takes a sub transmission voltage (i.e. 66 or 33kV) and converts it to a distribution voltage. This includes sub transmission regulators.

4.2 Acronyms and abbreviations

The following abbreviations and acronyms appear in this standard.

Term, abbreviation or acronym	Definition
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
NEM	National Electricity Market

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5 Lines Preventive Maintenance Programs

5.1 Overhead Line Asset Maintenance

5.1.1 Overhead and Underground Line Inspection (Asset Inspection) Program

Overhead and underground line inspections or asset inspections are to be performed in accordance with the following standards:

- STNW1139* – Standard for Overhead Tower Lines, section 8 (ISCA)
- STNW1140* – Standard for Overhead Pole Lines, section 7 (ISCA)
- STNW1143* – Standard for Distribution Cable Systems, section 6 (ISCA)
- STNW1136 – Standard for Earthing Systems, section 6 (ISCA)
- STNW1144* – Standard for Public Lighting Assets, section 7 (ISCA)

Note: * Denotes documents that have not yet been published on the Process Zone.

Overhead and underground line inspections using ground based inspection crews are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Transmission, Sub-transmission and Distribution Line towers and poles (all voltage levels). Communication structures, poles in substations and poles in linesperson training centres. Underground pillars identified when inspecting mainly overhead areas and in URD areas.	The inspection interval is dependent on analysis of performance, defects, failures and proximity of the line to high risk locations for each maintenance zone. 4 years	3030	AIP3X	Maintenance Zone Level
	<ul style="list-style-type: none"> • Wood pole urban • Wood pole rural HR • Steel pole direct buried urban/coastal 		AIP3 (auto generated per pole)	N/A
	6 years	3036		
	8 years	3038		
Level 2 Pole Serviceability Assessment may be conducted on any pole and tower structures that have been identified by the Asset Inspector as suspect and requiring a Level 2 Serviceability Assessment.	As required (dependent upon outcome of initial asset inspection)	N/A	AIP5X	N/A
			AIP5 (auto generated per pole)	N/A
<i>Carpentaria Minerals Province Mt Isa</i>				
220kV Transmission Towers (steel lattice)	Every 2 years	3032	AIP6X	Maintenance Zone Level

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For overhead lines, these inspections cover:

- Above ground inspection of wood poles, reinstated wood poles, concrete poles, steel poles, composite poles, steel lattice towers and streetlight standards to assess pole serviceability.
- Below ground inspection of wood poles, reinstated wood poles, composite poles, steel poles, steel lattice towers and streetlight standards (where steel poles and towers meet age criteria) to assess pole serviceability
- Inspection and assessment of the condition of:
 - Pole assembly components including cross-arms, insulators, line hardware, stays
 - Earth wires, conductors, joints, splices, customer service lines
 - Pole mounted equipment e.g. Substations, switches
- Measurement of conductor clearance to ground and clearance to structure
- Assessment of easement conditions including access tracks, vegetation, access problems
- Observation of first customer pole and point of connection
- Data capture on assets

For underground lines, these inspections cover:

- Visual inspection of the external condition of pillars.
- Visual inspection along the route of underground cables to check any evidence of trench subsidence.

Minor maintenance work which may also be carried out during this inspection includes:

- Pole treatment for decay
- Replacement of earth guards and stay guards
- Termite and corrosion treatment
- Removal of vegetation that impedes inspection
- Fitting of site labels

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5.1.2 Pole Top Inspection Program (High Rainfall Areas)

Pole top inspections are to be performed in accordance with the following standard:

- STNW1140* – Standard for Overhead Pole Lines, section 9 (ISCA)

Note: * Denotes documents that have not yet been published on the Process Zone.

Pole top inspections, which are to be carried out by climbing the pole or with the aid of an EWP, using either high voltage live work or dead techniques are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Transmission, Sub-transmission or Distribution Maintenance Zones that meet rainfall criteria (>1,500mm of rain per year) in Northern Region wet tropics areas. Only poles that have been identified as high risk and meet the following criteria are to be inspected: <ul style="list-style-type: none"> • Ergon owned • Wood • Older than 15 years 	Every 4 or 6 years – aligned with or offset by 2 years from asset inspection program based on historical line performance and risk assessment or as requested by the Network Maintenance and Performance Group 4 years <ul style="list-style-type: none"> • Wood pole urban • Wood pole rural HR 6 years <ul style="list-style-type: none"> • Wood pole rural 	3150	AIP4X	Maintenance Zone Level
			AIP4 (auto generated per pole)	N/A

The purpose of pole top inspections is to:

- Identify defects that are difficult to identify and prioritise from a ground based inspection.
- Gather detailed data on the condition of the pole top for determining defect refurbishment or replacement strategies.

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5.1.3 Pole Top Detailed Aerial Inspection Program

Pole top detailed aerial inspections are to be performed in accordance with the following standards:

- STNW1139* – Standard for Overhead Tower Lines, section 7 (ISCA)
- STNW1140* – Standard for Overhead Pole Lines, section 8 (ISCA)

Note: * Denotes documents that have not as yet been published on the Process Zone.

This program is under implementation phase and will be performed using technologies that are able to provide adequate detailed imagery for condition assessment. These technologies may include aerial inspection, EPV inspection or other techniques. Pole top detailed aerial inspections are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
1 Subtransmission Maintenance Zone per region (3 Region) per annum	No nominated interval. As requested by the Network Maintenance and Performance Group	3320	AIP6X	Maintenance Zone Level
1 High Risk Distribution Maintenance Zone per region (3 Region) per annum			AIP6 (per pole)	N/A
<i>Carpentaria Minerals Province Mt Isa</i>				
220kV Transmission Towers (steel lattice)	Every 2 years – offset from ground based Overhead and Underground Line Inspection program.	3320	AIP6X	Maintenance Zone Level

The purpose of the Pole Top Detailed Inspection Program is to:

- Identify defects that are difficult to identify and prioritise from a ground based inspection.
- Gather detailed data on condition for determining defect refurbishment or line replacement strategies.

5.1.4 Insulator Cleaning Program

Insulator cleaning is to be programed as follows to targeted sites only:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Transmission and Subtransmission Line insulators <ul style="list-style-type: none"> • Insulators on sections of line in known high pollution areas and known areas subject to dust contamination and flashover in the dry season. 	As requested by the Network Maintenance and Performance Group.	3400	LINCX	Maintenance Zone Level

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5.1.5 Summer Preparedness Line Patrol Program

Summer preparedness line patrols are to be performed in accordance with the following standards:

- STNW1139* – Standard for Overhead Tower Lines, section 6 (SHI)
- STNW1140* – Standard for Overhead Pole Lines, section 6 (SHI)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Line Patrols are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
<ul style="list-style-type: none"> • Transmission, Subtransmission and Distribution Maintenance Zones or parts of maintenance zones where the risk of an outage is unacceptable. • HV overhead component of Distribution Lines supplying critical customer loads See below for factors to be considered when determining criticality of lines	Annual Line Patrol prior to the storm season. To be carried out <ul style="list-style-type: none"> • In August-September of each year • By aerial inspection in rural areas by helicopter or approved slow flying light aircraft • By ground based inspection in built up urban areas 	3300 (Aerial Patrol)	LFPAX (Aerial Patrol)	Maintenance Zone Level
		3310 (Ground Patrol)	LFPGX (Ground Patrol)	Maintenance Zone Level
HV overhead component of Transmission, Subtransmission and Distribution Lines that have been identified as being in High Bushfire Hazard areas	Annual Line Patrol prior to the storm season. To be carried out <ul style="list-style-type: none"> • In August-September of each year • By aerial inspection in rural areas by helicopter or approved slow flying light aircraft 	3300	LBPAX	Vegetation Zone Level
<i>Carpentaria Minerals Province Mt Isa</i>				
220kV Transmission Towers (steel lattice)	Annual Line Patrol prior to the storm season. To be carried out <ul style="list-style-type: none"> • In August-September of each year • By aerial inspection in rural areas by helicopter or approved slow flying light aircraft 	3300	LFPAX	Maintenance Zone Level

Only major “fault” type defects (e.g. missing ties, broken cross-arms, poles severely damaged by lightning or bushfires etc.) are to be identified and reported to the fault centre as they are identified so that they can be immediately rectified. Record all “fault” type defects and reconcile with work orders initiated by the fault centre through FeederStat – no other defects are to be recorded.

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The factors to be considered when determining the lines to be patrolled are:

Likelihood of a forced outage:

- Historical reliability performance of the line
- Age and condition of the line
- Line Design e.g. presence or absence of an OHEW, concrete poles etc.
- Environment in which the line is placed e.g. lightning exposure, high rainfall areas, remoteness, High Bushfire Hazard as mapped by RFS etc.
- Possibility of asset failure initiating bushfires

Consequences of a forced outage:

- Number of customers supplied by the line
- Number and importance of industrial and commercial customers supplied by the line
- Availability of alternative supply
- Political and community reaction.
- Safety

For VZ identified as requiring an Aerial Patrol for Bushfire Mitigation purposes only, only the sections of line that are deemed high risk need to be patrolled. Records must be kept of the sections covered by the patrol

5.1.6 Thermal Surveying Program

Thermal surveying is to be performed in accordance with the following standards:

- STNW1139* – Standard for Overhead Pole Lines, section 9 (OSM)
- STNW1140* – Standard for Overhead Tower Lines, section 10 (OSM)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Thermo-scanning of conductor joints and connections is to be programed as follows to targeted sites only:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Distribution Maintenance Zones within the first one kilometre of zone substations (HV backbone only). Cable connections in Ground mounted distribution substations supplying major commercial customers or central business districts.	Every 4 years – aligned with or offset by 2 years from asset inspection program	3350	LTSPX	Maintenance Zone Level
			LTSS	Distribution Substation Slot Level S-NTPADSUB S-NTENCSub S-NTSUBS
Nominated high risk 33kV and 66kV Subtransmission Lines	No nominated interval. As requested by the Network Maintenance and Performance Group.	3350	LTSPX	Maintenance Zone Level

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5.1.7 Earth Testing Program

Earth testing is to be performed in accordance with the following standards:

- STNW1136 – Standard for Earthing Systems, section 7 (ISCA)

Earth testing is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
SWER Pole Mounted Equipment Earths <ul style="list-style-type: none"> • Distribution Substations • Isolating Substations • Reactors • Regulators • Reclosers • Operator Earthing Points • Sectionalisers (tank type) 	The testing cycle assigned is dependent on analysis of performance, defects, failures and proximity of the line to high risk locations performed to determine the overhead and underground inspection interval. 4 years <ul style="list-style-type: none"> • Wood pole rural HR 6 years <ul style="list-style-type: none"> • Wood pole rural 8 years <ul style="list-style-type: none"> • Steel pole and tower • Concrete pole 	3100	AIE1X	Maintenance Zone Level
		3106	AIE1 (auto generated per earth)	N/A
		3108		
Non-SWER Pole Mounted Equipment Earths <ul style="list-style-type: none"> • Distribution Substations • Air Break Switches • Regulators • Reclosers 	6 years <ul style="list-style-type: none"> • Wood pole rural 8 years <ul style="list-style-type: none"> • Wood pole urban • Wood pole rural HR • Steel pole direct buried urban/coastal • Steel pole and tower • Concrete pole 	3116	AIE2X	Maintenance Zone Level
		3118	AIE2 (auto generated per earth)	N/A

Earth Testing is generally carried out at the same time as the Asset Inspection.

5.1.8 Pole Mounted Switch Inspection and Maintenance Program

Pole mounted switch inspection and maintenance is to be performed in accordance with the following standards:

- STNW1145 – Standard for Air Break Switches, Isolators, Earth Switches and Fault Throw Switches, section 9 (IM)
- STNW0411 – Standard for Overhead Fuses, Links and Vacuum / SF₆ Load Break Switches, section 6 (ISCA)

Inspection and maintenance for pole mounted switches is to be programed as follows:

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Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Air break switches and load break gas switches	Every 6 years	3160	AIA1X	Maintenance Zone Level
			AIA1 (auto generated per ABS)	N/A

Inspection and maintenance of pole mounted switches includes:

- Maintenance of lubrication of fixed and moving contacts
- Inspection and adjustment of operating mechanism
- Repair or replacement of ABS components where required
- Repair or replacement of ABS units where required
- Inspection and maintenance of earth braids

5.1.9 Automatic Circuit Recloser Routine Inspection Program

Automatic circuit recloser (ACR) inspections are to be performed in accordance with the following standards:

- STNW1147 – Standard for Oil-filled Automatic Circuit Reclosers and Sectionalisers, section 6 (ISCA)
- STNW1148 – Standard for SF6 / Vacuum Automatic Circuit Reclosers and Sectionalisers, section 6 (ISCA)

ACR inspections are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Pole Mounted Reclosers – manual and electronic that are not remotely monitored	Every 12 months – site visit in September	3681	LSWAN	Switch Slot Level S-NTCBREC
Pole Mounted Reclosers – manual and electronic that are remotely monitored	Every 3 years	3686	LSWAR	Switch Slot Level S-NTCBREC

Routine inspection of pole mounted Reclosers includes a visual inspection and assessment of the condition of the recloser and the recording of counter readings.

Note: Enclosed HV Switch Routine Inspections should, where practical, be planned for completion at the same time as Pole Mounted HV Equipment Routine Inspection (see section 5.1.11).

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5.1.10 Pole Mounted HV Equipment Routine Inspection Program

Pole mounted HV equipment inspections are to be performed in accordance with the following standards:

- STNW1150* – Standard for Pole Mounted Transformers, section 6 (ISCA)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Pole Mounted HV Equipment routine inspections are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Pole Mounted Regulators	Every 12 months (site visit in September)	3381	LREG	Regulator Slot Level S-NTREG
Pole Mounted Reactors on long SWERs that are lightly loaded. The EGI for these reactors is G-RX-E.	Inspection to be conducted in either September, in conjunction with pole mounted recloser inspections, or in March, to ensure asset is operational after storm season.	3650	LREA	Reactor Slot Level S-NTREAC

Routine visual inspection and condition assessment of pole mounted transformers, regulators and reactors and to ensure that equipment is operational after the storm season. A routine visual inspection of pole mounted transformers, regulators and reactors is also part of the overhead and underground line inspection program.

Note: Pole Mounted HV Equipment Routine Inspections should, where practical, be planned for completion at the same time as Enclosed HV Switch Routine Inspections (see section 5.1.9).

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5.2 Underground Line Asset Maintenance

5.2.1 Underground Pillar Internal Inspection Program

Underground pillar internal inspections are to be performed in accordance with the following standards:

- STNW1143* – Standard for Distribution Cable Systems, section 7 and 8 (IM)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Internal inspection of underground pillars is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Underground Link Pillars Underground Service Pillars in commercial sub divisions which have a high load and/or are located in a high risk location	Every 10 years based on historical defects identified and risk assessment	3550	LUGPX	Maintenance Zone Level

These inspections cover:

- Checking the integrity of all connections
- Checking for vermin infestation such as termites.

5.2.2 Ring Main Unit (RMU) Maintenance Program

Ring Main Unit maintenance is to be performed in accordance with the following standards:

- STNW1151 – Standard for Oil Ring Main Units, section 7 (IM)
- STNW1152 – Standard for SF6 Ring Main Units, section 7 (NIM)
- STNW1153 – Standard for Polymeric Ring Main Units, section 7 (IM)

Ring main unit maintenance is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Oil Filled RMUs	Every 12 years	3651	LRMUO	Distribution Substation Slot Level S-NTPADSUB S-NTENCSub S-NTSU
Oil Filled RMUs – South Wales – Tiger/Lucy-FRMU	Every 18 years	3653	LRMUOS	Distribution Substation Slot Level
Epoxy RMUs	Every 12 years	3652	LRMUE	Distribution Substation Slot Level
SF ₆ RMUs	Every 18 years	3662	LRMUG	Distribution Substation Slot Level

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Ring Main Unit Maintenance, depending on the type, may include:

- Functional test to verify operation of the switches and indicators
- Test tripping of switch fuse
- Inspection and maintenance of internal components
- Inspection and cleaning of contacts
- Replacement of oil (Oil filled units only)
- Measurement and recording of contact and busbar resistance
- Measurement and recording of busbar insulation resistance
- Testing and checking of fuses
- Inspection of cable air boxes.

5.2.3 Freestanding Ring Main Unit (RMU) Inspection Program

Freestanding ring main unit inspections are to be performed in accordance with the following standards:

- STNW1151 – Standard for Oil Ring Main Units, section 6 (ISCA)
- STNW1152 – Standard for SF₆ Ring Main Units, section 6 (ISCA)
- STNW1153 – Standard for Polymeric Ring Main Units, section 6 (ISCA)

Freestanding ring main unit inspections are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Oil Filled RMUs	Every 12 years (offset 6 years from the maintenance cycle)	3682	LSU801	Freestanding RMU Site Slot Level S-NTSU (with 'GT' plant_no)
Epoxy/Polymeric RMUs	Every 12 years (offset 6 years from the maintenance cycle)	3683	LSU803	Freestanding RMU Site Slot Level S-NTSU (with 'GT' plant_no)
SF ₆ RMUs	Every 18 years (offset 6 years from the maintenance cycle so that there are 2 x ISCA and 1 x NIM every 18 years, 6 years apart)	3684	LSU802	Freestanding RMU Site Slot Level S-NTSU (with 'GT' plant_no)
	Every 18 years (offset 6 years from the maintenance cycle so that there are 2 x ISCA and 1 x NIM every 18 years, 6 years apart)	3685	LSU802	Freestanding RMU Site Slot Level S-NTSU

These inspections and routine housekeeping include:

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- Visual inspection and assessment of the condition of foundations, enclosure and internal equipment.
- Enclosure security
- Checking of labels and signs
- Safety and security of operating tools
- Treatment of vermin
- Removal of rubbish, vegetation and debris from around cabinet
- Removal, or painting, of graffiti
- Identification and reporting of specific known defects or abnormalities.

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5.3 Distribution Substation Asset Maintenance

5.3.1 Distribution Minor Substation Inspection Program (Enclosed Subs)

A distribution minor substation is any substation that takes a distribution voltage and converts it to an LV voltage, and meets all of the following criteria:

- Does not contain protection or DC system equipment
- Does not have circuit breaker switchgear and/or switchboard of more than one outgoing feeder
- Is not enclosed in an Ergon owned building
- Is not a padmount substation
- Is enclosed in a building or fence that is deemed easy to access for maintenance purposes

Distribution minor substation inspections are to be performed in accordance with the following standards:

- STNW1137* – Standard for Operational Buildings and Sites, section 7.2 (ISCA) and 7.4 (NIM)
- STNW1149* – Standard for Ground Mounted Distribution Transformers, section 6 (ISCA)
- STNW1151 – Standard for Oil Ring Main Units, section 6 (ISCA)
- STNW1152 – Standard for SF6 Ring Main Units, section 6 (ISCA)
- STNW1153 – Standard for Polymeric Ring Main Units, section 6 (ISCA)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Distribution minor substation inspection and routine housekeeping is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Distribution Minor substations – Ergon owned installations	Every 12 months	3481	LSEC	Distribution Substation Slot Level S-NTENC SUB

These inspection and routine housekeeping include:

- Visual inspection and assessment of the condition of electrical equipment
- Building/Facility security and condition
- Checking of labels and signs
- Reading and recording of MDIs
- Battery checks
- Fire extinguisher checks
- Safety and security of operating tools
- Checking for spares e.g. fuses
- Treatment for vermin
- Removal of rubbish
- Mowing of grass
- Checking condition of identified asbestos material.

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5.3.2 Padmount Substation Inspection Program

Padmount substation inspections are to be performed in accordance with the following standards:

- STNW1137* – Standard for Operational Buildings and Sites, section 8.2 (ISCA) and 8.3 (NIM)
- STNW1149* – Standard for Ground Mounted Distribution Transformers, section 6
- STNW1151 – Standard for Oil Ring Main Units, section 6 (ISCA)
- STNW1152 – Standard for SF6 Ring Main Units, section 6 (ISCA)
- STNW1153 – Standard for Polymeric Ring Main Units, section 6 (ISCA)
- STNW1154 - LV Switchgear and Fusegear, section 6.2 (ISCA)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Padmount substation inspection and routine maintenance is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Padmount Substations – commercial	Every 2 years	3581	LSPC	Distribution Substation Slot Level S-NTPADSUB
Padmount Substations – residential	Every 3 years	3582	LSPR	Distribution Substation Slot Level S-NTPADSUB

These inspections and routine housekeeping include:

- Visual inspection and assessment of the condition of foundations, enclosure and internal equipment.
- Padmount security
- Checking of labels and signs
- Reading and recording of MDIs
- Safety and security of operating tools
- Checking for spares e.g. fuses
- Treatment of vermin
- Removal of rubbish, vegetation and debris from around cabinet
- Removal, or painting, of graffiti
- Identification and reporting of specific known defects or abnormalities.

Standard for Preventive Maintenance Programs 2015-16 to 2019-20

5.3.3 Asbestos Reinspection

Lines Sites containing either confirmed or suspected asbestos are to be inspected annually to confirm the state of the asbestos. All inspections are to be completed in accordance with Legislation and Ergon Energy's Asbestos Management Plan.

Condition inspections are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Lines Buildings and Sites identified as high risk by the Asbestos Manager	Every 12 months	3530	LASBES	Distribution Substation Level S-NTENCSUB
Lines Buildings and Sites not identified as high risk	Every 3 years	3540	LASBES	Distribution Substation Level S-NTENCSUB

5.3.4 Distribution Transformer Oil Sampling Program

Distribution transformer oil sampling is to be performed in accordance with the following standard:

- STNW1149* – Standard for Ground Mounted Distribution Transformers, section 8 (OSCA)

Note: * Denotes documents that have not as yet been published on the Process Zone.

The oil sampling program for Dissolved Gas Analysis (DGA) is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Ground mounted distribution transformers that meet the following criteria <ul style="list-style-type: none"> • Located within a building enclosure • Rating \geq 1MVA • Has a sampling point 	Every 3 years Additional oil sampling and DGA analysis may be required <ul style="list-style-type: none"> • if routine oil sampling and DGA analysis reveals any abnormal results • Post adverse load conditions 	3360	LTD401	Distribution Transformer Physical Level G-TD-B and G-TD-D

This program includes:

- Inspection for leaks, signs of internal pressures, oil levels, loose connections and seals.
- Cleaning of porcelains
- Sampling and analysis for Dissolved Gas (DGA), as per Ergon Energy specified test suite for DGA.
- Top up with oil if required.

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5.4 Public Lighting Asset Maintenance

The Preventive Maintenance Programs for Ergon Energy will include All Rate 1 and Rate 2 Public Lighting and Pedestrian Crossings.

All Ergon Energy owned (Rate 1 and Rate 2) streetlight assets will either be part of a Streetlight Patrol Program, Bulk Replacement Plan or a combination of both. Rate 3 lights will not be included.

5.4.1 Public Lighting Patrol Program

Public lighting patrols are to be performed in accordance with the following standards:

- STNW1144* – Standard for Public Lighting Assets, section 6 (SHI)

Note: * Denotes documents that have not as yet been published on the Process Zone.

Routine public lighting patrols are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
a. Major highways, thoroughfares and main roads with High Intensity Lighting usually designed to Australian Standards AS/NZS1158 located within defined geographic areas and identified as having significant numbers of streetlight patrol lights	One night patrol of each road or defined pedestrian crossing or intersection every 12 months.	3200	AILPX	Streetlight Zone Level
b. Pedestrian Crossings not covered by a) above, but located within the same geographic area as a) above – all types of lighting whether incandescent, fluorescent, or High Intensity Lighting			AILP (auto generated per light)	N/A
c. Major intersections including roundabouts with High Intensity Lighting not covered by a) above but located within the same geographic area as a) above.				
d. Suburban and other lighting in built up urban areas not covered by a, b, c above	No routine patrols to be carried out.	N/A	N/A	N/A

Provision for response to defective streetlights reported by the public is NOT included in this program.

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5.4.2 Bulk Lamp Replacement Program

Bulk lamp replacement on public lighting assets is to be performed in accordance with the following standards:

- STNW1144* – Standard for Public Lighting Assets, section 7 (ISCA) and section 8 (OSM)

Note: * Denotes documents that have not as yet been published on the Process Zone.

The bulk lamp replacement program aims to reduce the frequency of ad-hoc repairs, to maintain lumen output and to ensure the safety of the public. The Bulk Lamp Replacement will be carried out on all streetlights.

Routine bulk lamp replacement on streetlights is to be programed as follows:

Assets to be Replaced	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Lamps to be replaced in the following scenarios: a. Major Road Lighting included in the Streetlight Patrol Program as per 5.4.1 a) and c) above. b. Major Road Lighting not included in the Streetlight Patrol Program c. Pedestrian Crossings d. Minor Road Lighting	3 year cycle (MST to be scheduled on a 6 year cycle offset 3 years from BLR inc PE cell replacement MST 3210)	3220	AILBX (BLR not inc PE Cell)	Streetlight Zone Level
			AILB (auto generated per light)	N/A
PE Cell Replacement Bulk photo electric (PE) cell changes are to coincide with bulk lamp changes	6 year cycle - every second bulk lamp replacement cycle (MST to be scheduled on a 6 year cycle offset 3 years from BLR only MST 3220)	3210	AILCX (BLR inc PE Cell)	Streetlight Zone Level
			AIRC (auto generated per light)	N/A

Provision for response to defective streetlights reported by the public is NOT included in this program.

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5.5 Vegetation and Access Track Maintenance

5.5.1 ROAMES Flight and Data Processing Program

Routine aerial data capture of all power lines for identification of vegetation and other defects is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Vegetation on all power lines	Fixed <ul style="list-style-type: none"> 12 months 	VSA1	VROAME	Vegetation Zone Level

5.5.2 Vegetation Inspection and Clearing Program

Routine inspection and clearing of vegetation on power lines is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Vegetation on urban power lines	Variable <ul style="list-style-type: none"> 12 months 15 months 18 months 24 months 	VSU1 VSU4 VSU2 VSU3	VCRU**	Regulated Clearing – Vegetation Zone Level
Vegetation on rural power lines	Variable <ul style="list-style-type: none"> 12 months 18 months 24 months 36 months 48 months 60 months 72 months 	VSR9 VSR0 VSR1 VSR2 VSR3 VSR4 VSR5	VCRR**	Regulated Clearing – Vegetation Zone Level
<i>Unregulated Network</i>				
Vegetation on rural unregulated power lines	60 months	VSR4	VCUR**	Unregulated Clearing – Vegetation Zone Level
Note: ** in the Standard Job represents the two letter code for region (i.e. FN, NQ, CE, WB, SW)				

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5.5.3 Access Track Inspection Program

Routine Inspection of access tracks is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network and Isolated Generation Network</i>				
Access Tracks on rural power lines. Note: Remedial actions to be conducted will be based on condition assessment and prioritisation.	Every 4 years	3700	AIATX*	Maintenance Zone Level
	Every 6 years	3706		
	Every 8 years	3708		
Access Track program is to be aligned to the Overhead Asset Inspection Program, but scheduled 6 months ahead of when the line asset inspection work is scheduled. Access track maintenance to be scoped for these sites in such a way as to enable access for asset inspectors, vegetation assessors and line maintenance personnel. Access Track maintenance to be completed as close as possible and prior to asset inspections and vegetation assessments commencing on each line.				
<i>Carpentaria Minerals Province Mt Isa</i>				
Access Tracks on 220kV Transmission Line (steel lattice)	Every 2 years	3702	AIATUN	Maintenance Zone Level
Note: * In the Standard Job represents the one letter code for region (i.e. F, N, C, W, S)				

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6 Zone Substation Asset Maintenance – Primary and Auxiliary Equipment

6.1 STNW1137 Standard for Operational Buildings and Sites – Bulk & Zone and Major Distribution Sites Only

Only Bulk & Zone and Major Distribution sections of the standard are applicable in this section.

A full listing of the sections in the STNW1137 - Standard for Operational Buildings and Sites is shown below for reference

EGI	EGI Description	Variant
S-SS-A	Buildings & Sites – Bulk Zone	Bulk Zone
S-SS-B	Buildings & Sites – Major Distribution	Major Distribution
S-SS-C	Buildings & Sites – Minor Distribution	Minor Distribution
S-SS-D	Buildings & Sites – Padmount Distribution	Padmount Distribution
S-SS-E	Buildings & Sites – Cable Bridge	Cable Bridge
S-SS-F	Buildings & Sites – Cable Tunnel	Cable Tunnel
S-SS-G	Buildings & Sites – CSE – Compound	CSE-Compound
S-CS-A	Buildings & Sites – Comms	Comms-Site

6.1.1 SHI: Security and Hazard Inspection

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation Site S-SS-A	Bulk & Zone Substations	SSS901	9090 Suppression	Every 6 months

6.1.2 ISCA: In-Service Condition Assessment

The In-Service Condition Assessment is aligned with the Security and Hazard Inspection so that when they both fall on the same date, the ISCA will suppress the SHI, for that Substation

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation Site S-SS-A	Bulk & Zone Substation	SSS801	9080 Suppression	Every 18 months

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6.1.3 NIM: Non-Intrusive Maintenance

This Standard Job is not part of the suppression series

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation Site S-SS-A	Bulk & Zone Substations	SSS601	0060	Every 18 months

6.1.4 SS+PD: Specialist Survey – Partial Discharge

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation Site S-SS-A	Bulk & Zone Substations	SSS401	0040	Every 18 months

6.1.5 SS+TS: Specialist Survey - Thermoscan

Thermal surveying program includes:

- Infrared scan of HV plant, conductors and connections
- Metal clad switchgear outer surfaces
- Professional analysis of results of thermal surveying

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation Site S-SS-A	Bulk & Zone Substations HV Plant, Conductors and Connections	SSS402	0041	Every 18 months

6.1.6 SS+PCR: Specialist Survey – Property Condition Report

Where a communication site exists as part of a zone substation site the maintenance will be incorporated into the substation facility inspection.

Substation Building and Site inspection and maintenance includes:

- Assessment of condition of Access Track
- Inspect air conditioning systems, clean filters
- Check building and fencing

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations Property Condition	SSS403	0042	Every 2 years

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6.1.7 OSM+EF: Other Specific Maintenance – Electric Fence

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS201	0020	Every 12 months

6.1.8 OSM+AC: Other Specific Maintenance – Air Conditioning

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS202	0021	Every 12 months

6.1.9 OSM+VS: Other Specific Maintenance – Ventilation System

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS203	0022	Every 12 months

6.1.10 OSM+CL: Other Specific Maintenance - Cleaning

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS204	0023	Every 12 months

6.1.11 OSM+SE: Other Specific Maintenance - Security

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS205	0024	Every 12 months

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6.1.12 OSM+FS: Other Specific Maintenance – Fire Systems

Fire system inspection

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS206	0025	Every 12 months

6.1.13 OSM+FP: Other Specific Maintenance – Fire Panel

Fire Panel inspection

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS207	0026	Every 1 month (12 month MST)

6.1.14 OSM+MP: Other Specific Maintenance – Mowing and Pest

Mowing and Pest Control maintenance includes:

- Mowing of site
- Pest Control activities at site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS208	0027	Every 12 months

6.1.15 OSM+AS: Other Specific Maintenance - Asbestos

Substation Sites containing either confirmed or suspected asbestos are to be inspected annually to confirm the state of the asbestos. All inspections are to be completed in accordance with Legislation and Ergon Energy's Asbestos Management Plan.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network</i>				
Substation Site S-SS-A	Substation Building and Site identified as high risk by the Asbestos Manager	ZASBES	1380	Every 12 months
Substation Site S-SS-A	Substation Building and Sites not identified as high risk	ZASBES	1350	Every 3 years
Substation Site S-SS-A	Bulk & Zone Substation Asbestos	SSS209	0028	Every 5 years

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6.1.16 SS+SS: Specialist Survey – Structural Survey

Survey is carried out by external contractors where required.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network</i>				
Substation Site S-SS-A	Bulk & Zone Substations	SSS404	C04A	Condition Based

6.2 STNW1131: Substation Battery Systems

6.2.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-BA-A	N/A	N/A	ISCA – Only at Substation 18 months
	G-BA-B			
	G-BA-C			

6.2.2 SS+BT: Specialist Survey – Battery Test

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-BA-A G-BA-B G-BA-C	Substation and Communications DC Systems	SBA401	0040	Every 12 months

6.2.3 OSM+BR: Other Specific Maintenance – Battery REplacement

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-BA-A G-BA-B	VRLA – Substation Battery Banks	SBA201	0020	Every 7 years
	NICAD – Substation Battery Banks	SBA202		Every 20 years

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6.3 STNW1125: Power Transformers

Only Power Transformers (66-220kV) have a suppression series applied to the physical asset. The OSCA involves HV Testing of the Bushings for the in service Power Transformers (66-220kV) only.

6.3.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-TR-A: Power Transformers 11-33kV	N/A	N/A	ISCA – Only at Substation 18 months
	G-TR-B: Power Transformers 66-220kV			
	G-TR-C: Auxiliary Transformers 0.415-(11-33)kV			
	G-ET-A: Earthing Transformer 11-33kV			
	G-RG-A: Regulators 6.6-66kV			
	G-RX-A: Reactors (Oil Only)			

6.3.2 OSCA: Out of Service Condition Assessment (Bushing Tests)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-TR-B	Power Transformers 66-220kV	STR701	9070	Every 6 years

6.3.3 NIM: Non-Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria	
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>					
Physical (Equipment Level) G-TR-B	Power Transformers 66-220kV	STR601	9060	Every 12 years	
	G-TR-A	Power Transformers 11-33kV	STR602		0060
	G-TR-C	Auxiliary Transformers 0.415-(11-33)kV	STR603		
	G-ET-A	Earthing Transformers 11-33kV	SET601		
	G-RG-A	Regulators 6.6-66kV	SRG601		
	G-RX-A	Reactors (Oil Only)	SRX601		

Standard for Preventive Maintenance Programs 2015-16 to 2019-20

6.3.4 SS+OS: Specialist Survey – Oil Sample

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-ET-A	Earthing Transformer 11-33kV	SET401	0040	Every 3 years
G-RG-A	Regulators 6.6-66kV	SRG401		
G-RX-A	Reactors (Oil Only)	SRX401		
G-TR-A	Power Transformers 11-33kV	STR401		
G-TR-C	Auxiliary Transformers 0.415-(11-33)kV • Only for units older than 25 years			
G-TR-B	Power Transformers 66-220kV			Every 18 months

6.4 STNW1126: On-Load Tap Changers

6.4.1 ISCA: In Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	All G-TC: All OLTC units	N/A	N/A	ISCA – Only at substation 18 months

6.4.2 SS+OS: Specialist Survey – Oil Sample

All On-Load Tap Changers require a routine Oil Sample. On-Load Tap Changers have been categorised into three (3) main categories:

- Common Tank Vacuum
- Common Tank Oil
- Separate Selector / Separate Diverter

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) All G-TC-*	All OLTC except Fixed Tap Changers	STC401	0040	Every 18 months Starting 01/01/2015

6.4.3 Routine Maintenance for OLTC Vacuum and Oil

Routine testing and maintenance of Power Transformer On-Line Tap Changer (OLTC) is to be programed as follows:

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Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria	ACTIVITY
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>					
G-TC-A	Vacuum OLTC	STC501	0050	(30 years) 10,950 Days/300,000 Ops	IM OLTC COMM TANK VAC
G-TC-A-A	REINHAUSEN VV POST 6/06	STC501	0050	(30 years) 10,950 Days/300,000 Ops	IM OLTC COMM TANK VAC
		STC201	NO01	2,100,000 Operations	OSM REINHAUSEN VV INSP C/O
		STC202	NO02	300,000 Operations	OSM REINHAUSEN VV INSP DIVERTER
		STC203	NO03	600,000 Operations	OSM REINHAUSEN VV REPLACE SWITCH ELE
		STC204	NO04	1,200,000 Operations	OSM REINHAUSEN VV REPLACE INSERT GP
G-TC-A-B	REINHAUSEN VV PRE 7/06	STC501	0050	(30 years) 10,950 Days/300,000 Ops	IM OLTC COMM TANK VAC
		STC201	NO01	2,100,000 Operations	OSM REINHAUSEN VV INSP C/O
		STC202	NO02	150,000 Operations	OSM REINHAUSEN VV INSP DIVERTER
		STC203	NO03	450,000 Operations	OSM REINHAUSEN VV REPLACE SWITCH ELE
		STC204	NO04	900,000 Operations	OSM REINHAUSEN VV REPLACE INSERT GP
G-TC-B	All Common Tank Oil OLTC + Specific Types	STC502	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC COMM TANK OIL 6Y
	REINHAUSEN – RIII (without filter)				
	ATL/AT-315,317,321,323 (not 317.44 300L series) no changeover				
	ASEA - UZB	STC502	0051	(3 years) 1092 Days/ 30,000 Ops	IM OLTC COMM TANK OIL 3Y
	BRYCE FULLER – HD				
	CROMPTON PARKINSON-SD/HDS				
	MET CICKERS – LS/LSA				
	AEI – TYPE L				
REINHAUSEN – RIII (with filter)	STC502	0052	(12 years) 4380 Days/ 120,000 Ops	IM OLTC COMM TANK OIL 12Y	
REINHAUSEN - D					
G-TC-B-A	ABB-UZFDT	STC502	0050	(12 years) 4380 Days/ 120,000 Ops	IM OLTC COMM TANK OIL 12Y
		STC205	NO01	500,000 Operations	OSM+ST OLTC ABB UZFDT REPLACE PARTS
G-TC-B-B	ALL	STC206	0020	Interval 18 Months (546 days)	OSM OLTC ATL AT/ASD ASEA UZE CO SWITCH



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Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria	ACTIVITY
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>					
G-TC-B-B	ASD-319.44/500	STC502	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC COMM TANK OIL 6Y
	ATL/AT-315,317,321,323 (not 317.44 300L series) with changeover				
	ASEA/UZE	STC502	0051	(12 years) 4380 Days/ 120,000 Ops	IM OLTC COMM TANK OIL 12Y
G-TC-B-C	ATL AT – 317.44 (with changeover)	STC206	0020	Interval 18 Months (546 days)	OSM+ST OLTC ATL/AT317.44
		STC503	0050	(6 years) 2190 Days/ 60,000 Ops	IM+ST OLTC GENEVA WHEEL PIN
G-TC-B-H	ATL AT – 317.44 (without changeover)	STC503	0050	(6 years) 2190 Days/ 60,000 Ops	IM+ST OLTC GENEVA WHEEL PIN
G-TC-B-D	REINHAUSEN / B ALL	STC504	0050	(6 years) 2190 Days/ 50,000 Ops	IM+ST OLTC REIN/B SPRING ENERGY UNIT
	REINHAUSEN / B 111	STC207	NO01	400,000 Operations	OSM+ST OLTC REINHAUSEN/B
	REINHAUSEN / B 111 100				
	REINHAUSEN / B 111 150				
G-TC-B-E	REINHAUSEN/MA2-MECH DR	STC208	NO01	70,000 Operations	OSM+ST OLTC REIN/MA2 MECH
		STC502	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC COMM TANK OIL 6Y
G-TC-B-F	REINHAUSEN/MA4-MECH DR	STC209	NO01	70,000 Operations	OSM+ST OLTC REIN/MA4 MECH
		STC502	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC COMM TANK OIL 6Y
G-TC-B-G	FULLER / F / 317 33/300	STC505	0050	(3 years) 1092 Days/ 30,000 Ops	IM+ST OLTC FULLER/F BRAID CLEARANCE
G-TC-C	SEPARATE SELECTOR/ DIVERTER COMMON DIVERTER MAINT	STC507	0051	(6 years) 2190 Days/ 60,000 Ops	IM OLTC OIL SEP DIVERTER MAINT
	SEPARATE SELECTOR /DIVERTER COMMON SELECTOR MAINT	STC506	0050	(12 years) 4380 Days/ 120,000 Ops	IM OLTC OIL SEP SELECTOR MAINT 12
G-TC-C-A	SELECTOR MAINTENANCE	STC506	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC OIL SEP SELECTOR MAINT 6
	EE/AEI-M21 DIVERTER MAINTENANCE	STC539	0051	(3 years) 1092 Days/ 30,000 Ops	IM+ST OLTC+WIRE ROPES LUBE
G-TC-C-B	SELECTOR MAINTENANCE	STC506	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC OIL SEP SELECTOR MAINT 6
	Hawker Siddeley 317 DIVERTER MAINTENANCE	STC508	0051	(3 years) 1092 Days/ 30,000 Ops	IM+ST OLTC WIRE ROPES+GEARBOX
G-TC-C-C	SELECTOR MAINTENANCE	STC506	0050	(6 years) 2190 Days/ 60,000 Ops	IM OLTC OIL SEP SELECTOR MAINT 6
	MET VICKERS M52E45 DIVERTER MAINT	STC509	0051	(3 years) 1092 Days/ 30,000 Ops	IM+ST OLTC+GEARBOX OIL

Standard for Preventive Maintenance Programs 2015-16 to 2019-20

6.5 Circuit Breaker Inspection and Maintenance Programs

The following maintenance levels are applicable to all circuit breaker types within the network.

ISCA: In-Service Condition Assessment

In-Service Condition Assessments are carried out on all circuit breaker types in all substations as part of the 18 monthly substation inspections.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	ALL G-CB: All Circuit Breaker units	N/A	N/A	ISCA – Only at Substation 18 Months

SS+OSICA: Specialist Survey + Out of Service Insulation Condition Assessment

Out of Service Insulation Condition Assessments are a non-routine testing assessment performed on specified and problematic circuit breakers at the discretion of the Maintenance Manager.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level)	Specific Types and Problematic units	SCB401	C040	As required

6.5.1 STNW1119: Oil Circuit Breakers (11-66kV)

The variants include Indoor and Outdoor

OSCA: Out of Service Condition Assessment – Mechanism Function Check

This check is to be offset from the Protection and Control Function Check which also happens every 6 years to ensure the units are operated every 3 years.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-OIL-A	11-33kV Indoor	SCB701	9070 (Suppression)	Every 6 years
G-CB-OIL-D	11-33kV Indoor – Cap Bank			Every 3 years
G-CB-OIL-B	11-33kV Outdoor	SCB702		Every 6 years
G-CB-OIL-E	11-33kV Outdoor – Cap Bank			Every 3 years
G-CB-OIL-C	66kV Outdoor	SCB703		Every 6 years

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IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-OIL-A	11-33kV Indoor	SCB501	9050 (Suppression)	Every 12 years
G-CB-OIL-D	11-33kV Indoor – Cap Bank			Every 6 years
G-CB-OIL-B	11-33kV Outdoor	SCB502		Every 12 years
G-CB-OIL-E	11-33kV Outdoor – Cap Bank			Every 6 years
G-CB-OIL-C	66kV Outdoor	SCB503		Every 12 years

PFM: Post Fault Maintenance

Post fault maintenance should be carried out for oil circuit breakers that have carried out a specified number of fault clearance operations before the next scheduled maintenance. The specified number of fault operations is dependent upon the manufacturer/type of OCB.

Post fault maintenance tasks should be restricted to renewing the oil, dressing/replacing worn or pitted contacts and cleaning internal components.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria		
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>						
G-CB-OIL-A	11-33kV Indoor – All except Specific Type	SCB301	FO01	Every 6 Fault Operations		
G-CB-OIL-D	11-33kV Indoor – EEOLX I & II					Every 10 Fault Operations
	11-33kV Indoor – EMAIL J18					
	11-33kV Indoor – EMAIL S15					
	11-33kV Indoor – EEOLX III	SCB301	FO02	Every 20 Fault Operations		
G-CB-OIL-B	11-33kV Outdoor – All except Specific Type	SCB301	FO01	Every 6 Fault Operations		
G-CB-OIL-E	11-33kV Outdoor – AEI HLG1C44	SCB301	FO02	Every 3 Fault Operations		
	11-33kV Outdoor – EMAIL S15	SCB301	FO01	Every 10 Fault Operations		
	11-33kV Outdoor – EMAIL 345GC					
G-CB-OIL-C	66kV O/D			Every 6 Fault Operations		

6.5.2 STNW1120: Vacuum Circuit Breakers (11-33kV)

The variants include:

- Indoor – Vacuum interrupters in Air insulated compartment
- Outdoor – Vacuum interrupters in Air insulated compartment
- Indoor – Vacuum interrupters in SF₆ (Gas) insulated compartment
- Outdoor – Vacuum interrupters in SF₆ (Gas) insulated compartment

Standard for Preventive Maintenance Programs 2015-16 to 2019-20

MFC: Mechanism Function Check – Vacuum/Air CB (all except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Vacuum / Air CB (All except Specific Types)				
G-CB-VA-A	11-33kV Indoor	SCB705	9070 (Suppression)	Every 6 years
G-CB-VA-C	11-33kV Indoor – Cap Bank			Every 3 years
G-CB-VA-B	11-33kV Outdoor	SCB706	9070 (Suppression)	Every 6 years
G-CB-VA-D	11-33kV Outdoor – Cap Bank			Every 3 years
G-CB-VA-E	11-33kV Outdoor VK/GEC HWX – Cap Bank			Every 3 years
Vacuum / Gas CB (All except Specific Types)				
G-CB-VG-A	11-33kV Indoor	SCB707	9070 (Suppression)	Every 6 years
G-CB-VG-D	11-33kV Indoor – Cap Bank			Every 3 years
G-CB-VG-B	11-33kV Outdoor	SCB708	9070 (Suppression)	Every 6 years
G-CB-VG-E	11-33kV Outdoor – Cap Bank			Every 3 years
G-CB-VG-F/G	11-33kV Outdoor GEC/OLX36 / Cap Bank			Every 3 years

IM: Intrusive Maintenance – Vacuum/Air CB (all except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VA-A	11-33kV Indoor	SCB505	9050 (Suppression)	Every 12 years
G-CB-VA-C	11-33kV Indoor – Cap Bank			Every 6 years
G-CB-VA-B	11-33kV Outdoor	SCB506	9050 (Suppression)	Every 12 years
G-CB-VA-D	11-33kV Outdoor – Cap Bank			Every 6 years
G-CB-VA-E	11-33kV Outdoor ST – Cap Bank			Every 6 years

NIM: Non-Intrusive Maintenance – Vacuum/Gas CB (all except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VG-A	11-33kV Indoor	SCB601	9060 (Suppression)	Every 12 years
G-CB-VG-D	11-33kV Indoor – Cap Bank			Every 6 years
G-CB-VG-B	11-33kV Outdoor	SCB602	9060 (Suppression)	Every 12 years
G-CB-VG-E	11-33kV Outdoor – Cap Bank			Every 6 years

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NIM +: Non-Intrusive Maintenance Vacuum/Gas CB GEC/OX36 – Additional Requirement

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VG-F	11-33kV Outdoor	SCB619	0060	Every 6 years
G-CB-VG-G	11-33kV Outdoor Cap Bank		9060 (Suppression)	Every 6 years

NIM +: Non-Intrusive Maintenance Vacuum/Gas CB ABB/VBF – Additional Requirement

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VG-C	11-33kV Outdoor	SCB620	0060	Every 6 years (NO MFC)

OSM: Other Specific Maintenance – Condition Based Maintenance

To be performed at the discretion of the Maintenance Manager once a set number of operations have been reached

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VG-A	11-33kV Indoor			Condition Based
G-CB-VG-B	11-33kV Outdoor			Condition Based

OSM: Other Specific Maintenance – Replacement of Cap Bank Circuit Breakers

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-VA-E	11-33kV Outdoor – GEC/HWK & GEC/SBV I&II	SCB202	0020	Every 25 years OR 10,000 Operations
	11-33kV Outdoor – VK		0020	Every 25 years OR 15,000 Operations

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6.5.3 STNW1121, STNW1122: SF₆ (Gas) Circuit Breakers (11-33kV & 66-220kV)

The variants include Indoor and Outdoor for units with SF6 interrupters in SF6 insulated compartments/poles.

MFC: Mechanism Function Check

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GAS-A	11-33kV Indoor	SCB709	9070 (Suppression)	Every 6 years
G-CB-GAS-D	11-33kV Indoor – Cap Bank			Every 3 years
G-CB-GAS-B	11-33kV Outdoor	SCB710		Every 6 years
G-CB-GAS-E	11-33kV Outdoor – Cap Bank			Every 3 years
G-CB-GAS-C	66-220kV Outdoor	SCB711		Every 6 years
G-CB-GAS-F	66-220kV Outdoor – Cap Bank			Every 3 years

NIM: Non-Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GAS-A	11-33kV Indoor	SCB609	9060 (Suppression)	Every 12 years
G-CB-GAS-D	11-33kV Indoor – Cap Bank			Every 6 years
G-CB-GAS-B	11-33kV Outdoor	SCB610		Every 12 years
G-CB-GAS-E	11-33kV Outdoor – Cap Bank			Every 6 years
G-CB-GAS-C	66-220kV Outdoor	SCB611		Every 12 years
G-CB-GAS-F	66-220kV Outdoor – Cap Bank			Every 6 years

OSM: Other Specific Maintenance – Condition Based Maintenance

This maintenance shall not be carried out routinely. This level of maintenance shall be triggered when:

- PD monitoring indicates abnormal levels of PD activity
- Results of SF6 gas tests indicate serious deterioration within the compartment/s (66-220kV only)
- CB's reach a pre-determined set of fault operations

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Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GAS-A	11-33kV Indoor			Condition Based
G-CB-GAS-D	11-33kV Indoor – Cap Bank			Condition Based
G-CB-GAS-B	11-33kV Outdoor			Condition Based
G-CB-GAS-E	11-33kV Outdoor – Cap Bank			Condition Based
G-CB-GAS-C	66-220kV Outdoor			Condition Based
G-CB-GAS-F	66-220kV Outdoor – Cap Bank			Condition Based

6.5.4 STNW1123: Gas Insulated Switchgear (GIS) (33-132kV)

OSCA: Out of Service Condition Assessment (All except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GIS-A	33-220kV	SCB712	9070 (Suppression)	Every 6 years
G-CB-GIS-B	33-220kV – Cap Bank			Every 3 years

NIM: Non-Intrusive Maintenance Gas Insulated CB (All except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GIS-A	33-220kV	SCB612	9060 (Suppression)	Every 12 years
G-CB-GIS-B	33-220kV – Cap Bank			Every 6 years

OSM: Other Specific Maintenance – Condition Based Maintenance

This maintenance shall not be carried out routinely. This level of maintenance shall be triggered when:

- PD monitoring indicates abnormal levels of PD activity
- Results of SF6 gas tests indicate serious deterioration within the compartment/s (66-220kV only)
- CB's reach a pre-determined set of fault operations

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GIS-A	33-220kV			Condition Based
G-CB-GIS-B	33-220kV – Cap Bank			Condition Based

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SIEMENS 145kV Type 8DN8

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-GIS-C	33-220kV – SIEMENS 145kV Type 8DN8	Nil	Nil	ISCA at Substation Only

6.5.5 STNW1124: Minimum Oil Volume Circuit Breakers (MOV) (66-132kV)

OSCA: Out of Service Condition Assessment (all except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-MOV-A	66-220kV	SCB713	9070 (Suppression)	Every 6 years

IM: Intrusive Maintenance (all except specific types)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-MOV-A	66-220kV	SCB513	9050 (Suppression)	Every 12 years

PFM: Post Fault Maintenance

Post fault maintenance should be carried out for MOV circuit breakers that have carried out a specified number of fault clearance operations before the next scheduled maintenance. The specified number of fault operations is dependent upon the manufacturer/type of MOV.

Post fault maintenance tasks should be restricted to renewing the oil, dressing/replacing worn or pitted contacts and cleaning internal components.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-MOV-A	66-220kV – All Except Specific Types	SCB302	FO01	Every 6 Fault Operations
	66-220kV – ASEA HLD145		FO02	Every 24 Fault Operations
	66-220kV – ASEA HLR14525OE			
	66-220kV – Oerlikon TOFQ150.12		FO03	Every 10 Fault Operations
G-CB-MOV-B	66-220kV – ASEA HLC		FO01	Every 6 Fault Operations

ASEA HLC – IM: Intrusive Maintenance (Water Ingress)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CB-MOV-B	66-220kV – ASEA HLC	SCB521	0050	Every 6 years (NO OSCA)

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6.6 STNW1154: LV Switchgear and Fusegear

6.6.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-CB-LV-A: CB-Ground Mount Air – LV Fusegear	N/A	N/A	ISCA – Only at Substation 18 months
	G-CB-LV-B: CB-Ground Mount Air – LV Fusegear			
	G-CB-LV-C: CB-Ground Mount Air – LV Fusegear			
	G-CB-LV-D: CB-Ground Mount Air – LV Fusegear			

6.6.2 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria	
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>					
Physical (Equipment Level) G-CB-LV-A	CB-Ground Mount Air – LV Fusegear	SCB514	0050	Every 12 years	
	G-CB-LV-B	CB-Ground Mount Oil – LV Fusegear			SCB515
	G-CB-LV-C	CB-Ground Mount MCCB – LV Fusegear			SCB516
	G-CB-LV-D	CB-Ground Mount No CB – LV Fusegear	SCB201		CO20

6.7 STNW1128: Neutral Earthing Resistors and Reactors

6.7.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-NR-A: Neutral Earthing Resistors (Cubicle)	N/A	N/A	ISCA – Only at Substation 18 months
	G-NX-A: Neutral Earthing Reactor (Air Cored)			

6.7.2 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-NR-A	Neutral Earthing Resistors (Cubicle)	SNR501	0050	Every 12 years

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G-NX-A	Neutral Earthing Reactor (Air Cored)	SNX501		
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6.8 STNW1151, STNW1152, STNW1153: Ring Main Units (RMU)

This section contains the maintenance programs for Oil, SF6 and Polymeric RMU's

6.8.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-SU-OIL-A: RMU Oil 11-22kV	N/A	N/A	ISCA – Only at Substation 18 months
	G-SU-GAS-A: RMU Gas 11-33kV			
	G-SU-POLY-A: RMU Poly 11-22kV			

6.8.2 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-SU-OIL-A	Only Grid disconnect Units (RMUs) RMU Oil – All except Specific Types	SSU501	0050	Every 12 years
	RMU Oil – SOUTHWALES-TIGER		0051	Every 18 years
	RMU Oil – LUCY – FRMU			
G-SU-GAS-A	RMU Gas	SSU601	0060	Every 12 years
G-SU-POLY-A	RMU Poly/Epoxy	SSU502	0050	Every 12 years

6.9 STNW1145: Air Break Switches, Isolators, Earth Switches and Fault Throw Switches

6.9.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-IS-A: Airbreak Isolators – Manual	N/A	N/A	ISCA – Only at Substation
	G-IS-B: Airbreak Isolators – Motor			
	G-ES-A: Earth Switch – Manual			
	G-ES-B: Earth Switch - Motor			
	G-FT-A: Fault Throw Switch – Motor			
	G-IE-A: Isolator/Earth Switch – Manual			
	G-IE-B: Isolator/Earth Switch – Motor			

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6.9.2 OSCA: Out of Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-IS-A	Airbreak Isolators – Manual	SIS701	9070 (Suppression)	Every 6 years
G-FT-A	Fault Throw Switch – Motor	SFT701		
G-IE-B	Isolator/Earth Switch – Motor	SIE701		

6.9.3 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-IS-A	Airbreak Isolators – Manual	SIS501	9050 (Suppression)	Every 12 years
G-FT-A	Fault Throw Switch – Motor	SFT501		
G-IE-B	Isolator/Earth Switch – Motor	SIE501		
G-IE-A	Isolator/Earth Switch – Manual	SIE502	0050	
G-IS-B	Airbreak Isolators – Motor	SIS502		
G-ES-A	Earth Switch – Manual	SES501		
G-ES-B	Earth Switch - Motor	SES502		
G-IE-A	Isolator/Earth Switch – Manual	SIE502		

6.10 STNW 1129: Static VAR Compensators (SVC) and Capacitor Banks

6.10.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-SV-A : Static VAR Compensator	N/A	N/A	ISCA – Only at Substation 18 months
	G-SV-B: Static VAR Compensator – American Super Corp			
	G-CP-A: Capacitor Banks – Cubicle			
	G-CP-B: Capacitor Banks – Non-Cubicle			

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6.10.2 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-SV-A	Static VAR Compensator	SSV501	0050	Every 12 years
G-SV-B				
G-CP-A	Capacitor Banks – Cubicle	SCP501		
G-CP-B	Capacitor Banks – Non-Cubicle	SCP502		

6.10.3 OSM: Other Specific Maintenance – Water Cooling

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-SV-A	Static VAR Compensator	SSV205	0020	Every 2 years
G-SV-B				

6.10.4 OSM: Other Specific Maintenance – ASC Units

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-SV-B	Static VAR Compensator – American Super Corp	SSV201	0021	DC Bus Capacitor Replacement – 6 years
		SSV202	0022	Box Filter Replacement – 18 months
		SSV203	0023	PME Battery Replacement – 3 years
		SSV204	0024	MCE Battery Replacement – 3 years

6.11 STNW1136: Earthing Systems

6.11.1 ISCA: In-Service Condition Assessment – Earthing System Inspection

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-EM-A: Zone Substation Earth Mat	N/A	N/A	ISCA – Only at Substation 18 months

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6.11.2 ISCA: In-Service Condition Assessment – Earth System Testing

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-EM-A	Zone Substation Earth Mat	SEM201	0020	15 years

6.12 STNW1147: Oil Filled Automatic Circuit Reclosers and Sectionalisers

This section is applicable to oil filled reclosers located in substations only. The only routine maintenance for reclosers in substations is the ISCA and battery replacement at this stage. There is a program to currently replace the remaining oil filled ACR's in substations.

6.12.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-RE-OIL-A: Recloser – Oil 11-33kV	N/A	N/A	ISCA – Only at Substation 18 months
	G-SE-OIL-A: Sectionaliser – Oil 11-33kV			

6.12.2 SS+BR: Specialist Survey – Battery Replacement

This level of maintenance is not applicable to oil filled ACR's.

6.12.3 OSCA: Out of Service Condition Assessment – Mechanism Function Check

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-RE-OIL-A	Recloser – Oil 11-33kV			6 years

6.12.4 OSICA: Out of Service Insulation Condition Assessment

This maintenance activity has not been activated or applied to in service assets at this stage.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-RE-OIL-A	Recloser – Oil 11-33kV			Specific Types or Problematic Units

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6.12.5 IM: Intrusive Maintenance

This maintenance activity has not been activated or applied to in service assets at this stage.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-RE-OIL-A	Recloser – Oil 11-33kV			Condition Based Maintenance

6.12.6 PFM: Post Fault Maintenance

This maintenance activity has not been activated or applied to in service assets at this stage.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-RE-OIL-A	Recloser – Oil 11-33kV			Condition Based Maintenance – After 6 Fault Operations

6.13 STNW1148: SF₆/Vacuum Automatic Circuit Reclosers and Sectionalisers

The only routine maintenance for reclosers in substations is the ISCA and battery replacement at this stage.

6.13.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	Recloser – VAC 11-33kV	N/A	N/A	ISCA – Only at Substation 18 Months
	Recloser – GAS 11-33kV			

6.13.2 SS+BR: Specialist Survey – Battery Replacement

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-RE-VAC-A	Vacuum Recloser	SRE401	0040	Every 3 years
G-RE-GAS-A	Gas Recloser	SRE401		Every 3 years

6.13.3 OSM+CBM: Other Specific Maintenance – Condition Based Maintenance

This maintenance shall not be carried out routinely. This level of maintenance shall be triggered when:

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- An identified defect introduces the need for condition based maintenance
- The ACR reaches a pre-determined number of fault operations, in which case the ACR should be replaced.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-RE-VAC-A	Recloser – Vac 11-33kV			Condition Based Maintenance
G-RE-GAS-A	Recloser – Gas 11-33kV			

6.14 STNW1127: Free Standing Instrument Transformers – CT, VT, CVT, MU

6.14.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	All Oil and Gas CVT units	N/A	N/A	ISCA – Only at Substation
	All Oil CT units			
	All Gas CT units			
	All Resin CT units			
	All Oil VT units			
	All Gas VT units All Resin VT units			
All Oil MU units				

6.14.2 OSCA: Out of Service Condition Assessment – Oil Sample

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CT-B	Oil 66-220kV	SCT701	0070	Every 3 years
G-MU-B	Oil MU 66-220kV	SMU701		Every 3 years
G-VT-B	Oil VT 66-220kV	SVT701		Every 3 years

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6.14.3 OSICA: Out of Service Insulation Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CT-A	Oil CT's 11-220kV	SCT401	CO40	Specific Types or Problematic Units
G-CT-B				
G-CT-C	Resin CT's 11-220kV	SCT403		
G-CT-D	Gas CT's 11-220kV	SCT402		
G-CT-E				
G-VT-A	Oil VT's 11-220kV	SCT401		
G-VT-B				
G-VT-C	Resin VT's 11-220kV	SVT405		
G-VT-D	Gas VT's 11-220kV	SVT403		
G-VT-E				
G-VT-F	Oil CVT's 66-220kV	SVT402		
G-VT-G	Gas CVT's 66-220kV	SVT404		
G-MU-A	Oil MU's 11-220kV	SMU401		
G-MU-B				

6.14.4 OSM+CBM: Other Specific Maintenance – Condition Based Maintenance

To be performed at the discretion of the Maintenance Manager

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-CT-A	Oil CT's 11-220kV	SCT202	CO40	Specific Types or Problematic Units
G-CT-B				
G-CT-C	Resin CT's 11-220kV	SCT208		
G-CT-D	Gas CT's 11-220kV	SCT206		
G-CT-E				
G-VT-A	Oil VT's 11-220kV	SCT203		
G-VT-B				
G-VT-C	Resin VT's 11-220kV	SVT212		
G-VT-D	Gas VT's 11-220kV	SVT208		
G-VT-E				
G-VT-F	Oil CVT's 66-220kV	SVT205		
G-VT-G	Gas CVT's 66-220kV	SVT210		
G-MU-A	Oil MU's 11-220kV	SMU203		
G-MU-B				

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6.15 STNW1130: Outdoor Busbars

6.15.1 ISCA: In-Service Condition Assessment

Outdoor Busbars are to be inspected during the Routine Substation ISCA.

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	Outdoor Busbars	N/A	N/A	ISCA – Only at Substation 18 months

6.15.2 OSM+CBM: Other Specific Maintenance – Condition Based Maintenance

To be performed at the discretion of the Maintenance Manager

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-BU-A	Outdoor Busbars	SBU202	CO20	Non-Routine

6.16 STNW1163: Indoor Busbars

6.16.1 OSICA: Out of Service Insulation Condition Assessment

To be performed at the discretion of the Maintenance Manager

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-BU-B	Indoor Busbars	SBU401	CO40	Non-Routine

6.16.2 OSM+CBM: Other Specific Maintenance – Condition Based Maintenance

To be performed at the discretion of the Maintenance Manager

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-BU-B	Indoor Busbars	SBU201	CO20	Non-Routine

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6.17 STNW1133: Compressed Air Systems

6.17.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-CM-A: Compressed Air Systems	N/A	N/A	ISCA – Only at Substations 18 Months

6.17.2 OSCA: Out of Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-CM-A	Compressed Air Systems	SCM701	0070	Every 6 years

6.18 STNW1132: Audio Frequency Load Control (AFLC) Systems

6.18.1 ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Substation	G-AF-A: AFLC – Motor Gen	N/A	N/A	ISCA – Only at Substation 18 months
	G-AF-B: AFLC – Static Freq			

6.18.2 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-AF-A	AFLC – Motor Gen	SAF501	0050	Every 6 years
G-AF-B	AFLC – Static Freq	SAF502		

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6.19 Intelligent Electronic Devices

This section is still under development

6.19.1 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-IM-A	Weather Sensor			Every 12 months
G-IM-B	Oil Monitor			Every 12 months

6.20 Oil Filtration Systems

This section is still under development

6.20.1 IM: Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
G-OF-A	Oil Filtration Trojan Unit Sensor			Every 2 years

6.21 Pressure Vessel Statutory Check

Statutory checking of pressure vessels is to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level)	Pressure Vessels	ZPVL1	1170	Every 6 years

Statutory checking of pressure vessels includes:

- Organise for statutory pressure vessel checking according to Schedule 7 of the Workplace Health and Safety Regulations 1998 by a registered Plant Inspector (Tests required will depend on the size of the pressure vessel) see AS4343 to determine if plant is registrable.

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6.22 STNW1138: Network Assets held as Strategic Spares

6.22.1 OSCA: Out of Service Condition Assessment (In-Storage Condition Assessment)

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Physical (Equipment Level) G-TR-B	Power Transformers 66-220kV	STR401	0080	Every 3 years
G-TR-A	Power Transformers 33kV units only			
G-ET-A	Earthing Transformers 11-33kV	SET401		
G-RG-A	Regulators 6.6-66kV	SRG401		
G-RX-A	Reactors (Oil Only)	SRX401		

The above OSCA program for In-Storage Condition Assessment is only applicable to strategic spare assets with the status of SP. All other programs are to be suspended for the assets in spare status with only the relevant OSCA activated.

Currently have assigned the oil sampling standard job in the interim. New standard jobs are required for the spare OSCA's. Job cards are on SharePoint.

6.23 Non Ergon Owned Assets

The following is a list of Equipment Group Identifiers (EGIs) to be assigned to plant when ownership is transferred from Ergon to an external entity. Current policy is to maintain records of this plant in order to answer any queries that may arise in the future. As ownership of plant is transferred externally its EGI should be changed to one of the following;

Equipment Group Identifier	Equipment Group Identifier Description
<i>Equipment Group Identifiers to be assigned upon transference of ownership</i>	
G-AF-EXT	AFLC – NON ERGON ASSET
G-BA-EXT	BATTERY – NON ERGON ASSET
G-BH-EXT	BUSHING – NON ERGON ASSET
G-BU-EXT	BUSBAR – NON ERGON ASSET
G-CB-EXT	CIRCUIT BREAKER – NON ERGON ASSET
G-CM-EXT	COMPRESSED AIR SYS – NON ERGON ASSET
G-CP-EXT	CAPACITOR BANK – NON ERGON ASSET
G-CT-EXT	CURRENT TRANSFORMER – NON ERGON ASSET
G-EM-EXT	EARTH MAT – NON ERGON ASSET
G-ES-EXT	EARTH SWITCH – NON ERGON ASSET
G-ET-EXT	EARTHING TX – NON ERGON ASSET
G-FT-EXT	FAULT THROW SWITCH – NON ERGON ASSET

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Equipment Group Identifier	Equipment Group Identifier Description
<i>Equipment Group Identifiers to be assigned upon transference of ownership</i>	
G-IE-EXT	ISOLATOR EARTH SW – NON ERGON ASSET
G-IS-EXT	ISOLATOR – NON ERGON ASSET
G-NR-EXT	NEUTRAL EARTH RESISTOR – NON ERGON ASSET
G-NX-EXT	NEUTRAL EARTH REACTOR – NON ERGON ASSET
G-PR-EXT	PROTECTION RELAY – NON ERGON ASSET
G-RE-EXT	RECLOSER – NON ERGON ASSET
G-RG-EXT	VOLTAGE REGULATOR – NON ERGON ASSET
G-RX-EXT	REACTOR – NON ERGON ASSET
G-SD-EXT	SURGE DIVERTER – NON ERGON ASSET
G-SU-EXT	SWITCH UNIT – NON ERGON ASSET
G-SV-EXT	SVC – NON ERGON ASSET
G-TC-EXT	OLTC – NON ERGON ASSET
G-TD-EXT	DISTRIBUTION TX – NON ERGON ASSET
G-TR-EXT	POWER TRANSFORMER – NON ERGON ASSET
G-VT-EXT	VOLTAGE TRANSFORMER – NON ERGON ASSET
S-SS-A-EXT1	NON ERGON BULK SUB-ERGON PLANT
S-SS-A-EXT2	NON ERGON BULK SUB-NIL ERGON PLANT

7 Communications Systems – Asset Maintenance

7.1 ISCA: In-Service Condition Assessment for Communication Sites

Inspections are to be programed as follows:

S-CS-A-A - Access Standalone AC Mains Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS801	9082	Every 6 months
		CCS821	9081	Every 12 months

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S-CS-A-B – Access Standalone Solar/Hybrid Comm Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS802	9082	Every 6 months
		CCS822	9081	Every 12 months

S-CS-B – Access Substation Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-B	Access Substation Comms Site	CCS803	9082	Every 6 months
		CCS823	9081	Every 12 months

S-CS-C – Access Commercial Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-C	Access Commercial Comms Site	CCS804	9082	Every 6 months
		CCS824	9081	Every 12 months

S-CS-D – Access Other Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-D	Access Other Comms Site	CCS805	9082	Every 6 months
		CCS825	9081	Every 12 months

S-CS-E-A – Dist Standalone AC Mains Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS806	9082	Every 6 months
		CCS826	9081	Every 12 months

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S-CS-E-B – Dist Standalone Solar/Hybrid Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-E-B	Dist Standalone Solar/Hybrid Comms site	CCS807	9082	Every 6 months
		CCS827	9081	Every 12 months

S-CS-F – Dist Substation Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-F	Dist Substation Comms Site	CCS808	9082	Every 6 months
		CCS828	9081	Every 12 months

S-CS-G – Dist Other Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-G	Dist Other Comms Site	CCS809	9082	Every 6 months
		CCS829	9081	Every 12 months

S-CS-H – Core Critical Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-H	Core Critical Comms Site	CCS812	9083	Every 3 months
		CCS810	9082	Every 6 months
		CCS830	9081	Every 12 months

S-CS-I – Core Standalone Comms Site

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-I	Core Standalone Comms Site	CCS813	9083	Every 3 months
		CCS811	9082	Every 6 months
		CCS831	9081	Every 12 months

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7.2 IM: Intrusive Maintenance PLC

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-B	Access Substation Comms site	CCS501	0052	Every 36 months
Communications site S-CS-F	Dist Substation Comms site	CCS502	0052	Every 36 months

7.3 IM: Intrusive Maintenance Protection

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-B	Access Substation Comms site	CCS503	0053	Every 36 months
Communications site S-CS-F	Dist Substation Comms site	CCS504	0053	Every 36 months

7.4 IM: Intrusive Maintenance Base AL (Analogue)

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS505	0050	Every 12 months
Communications site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS506	0050	Every 12 months
Communications site S-CS-B	Access Substation Comms Site	CCS507	0050	Every 12 months
Communications site S-CS-D	Access Other Comms Site	CCS508	0050	Every 12 months
Communications site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS509	0050	Every 12 months
Communications site S-CS-E-B	Dist Standalone Solar/Hybrid Comms Site	CCS510	0050	Every 12 months
Communications site S-CS-F	Dist Substation Comms Site	CCS511	0050	Every 12 months

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Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-I	Core Standalone Comms Site	CCS512	0050	Every 12 months

7.5 IM: Intrusive Maintenance Base P25

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS513	0051	Every 12 months
Communications site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS514	0051	Every 12 months
Communications site S-CS-B	Access Substation Comms Site	CCS515	0051	Every 12 months
Communications site S-CS-D	Access Other Comms Site	CCS516	0051	Every 12 months
Communications site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS517	0051	Every 12 months
Communications site S-CS-E-B	Dist Standalone Solar/Hybrid Comms Site	CCS518	0051	Every 12 months
Communications site S-CS-F	Dist Substation Comms Site	CCS519	0051	Every 12 months
Communications site S-CS-I	Core Standalone Comms Site	CCS520	0051	Every 12 months

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7.6 SS: Specialist Survey Fall Arrestors

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS401	0040	Every 12 months
Communications site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS402	0040	Every 12 months
Communications site S-CS-B	Access Substation Comms Site	CCS403	0040	Every 12 months
Communications site S-CS-D	Access Other Comms Site	CCS404	0040	Every 12 months
Communications site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS405	0040	Every 12 months
Communications site S-CS-E-B	Dist Standalone Solar/Hybrid Comms Site	CCS406	0040	Every 12 months
Communications site S-CS-F	Dist Substation Comms Site	CCS407	0040	Every 12 months
Communications site S-CS-H	Core Critical Comms Site	CCS408	0040	Every 12 months
Communications site S-CS-I	Core Standalone Comms Site	CCS409	0040	Every 12 months

7.7 OSM: Out of Service Maintenance Generators

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS201	0020	Every 12 months
Communications site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS202	0020	Every 12 months
Communications site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS203	0020	Every 12 months
Communications site S-CS-E-B	Dist Standalone Solar/Hybrid Comms Site	CCS204	0020	Every 12 months
Communications site S-CS-A-I	Core Standalone Comms Site	CCS205	0020	Every 12 months

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7.8 SS: Specialist Survey Tower, Mast and Pole

Inspections are to be programed as follows:

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Site S-CS-A-A	Access Standalone AC Mains Comms Site	CCS410	0041	Every 60 months
Communications Site S-CS-A-B	Access Standalone Solar/Hybrid Comms Site	CCS411	0041	Every 60 months
Communications Site S-CS-B	Access Substation Comms Site	CCS412	0041	Every 60 months
Communications Site S-CS-D	Access Other Comms Site	CCS413	0041	Every 60 months
Communications Site S-CS-E-A	Dist Standalone AC Mains Comms Site	CCS414	0041	Every 60 months
Communications Site S-CS-E-B	Dist Standalone Solar/Hybrid Comms Site	CCS415	0041	Every 60 months
Communications Site S-CS-F	Dist Substation Comms Site	CCS416	0041	Every 60 months
Communications Site S-CS-I	Core Standalone Comms Site	CCS417	0041	Every 60 months

7.9 Building and Site Civil Inspection

Inspection and maintenance is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Building and Site including access tracks and fences	Every 12 months	C310	RCPCR	Bay

Where a communication site exists as part of a zone substation site the maintenance will be incorporated in the substation facility inspection.

Substation Building and Site inspection and maintenance includes:

- Assessment of condition of Access Track
- Inspect air conditioning systems, clean filters
- Check building and fencing.



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7.10 Mowing and Pest Control

Maintenance is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Communications Building and Site	Every 12 months	C320	RCMAP	Bay

Where a communication site exists as part of a zone substation site the maintenance will be incorporated in the substation facility inspection.

Mowing and Pest Control maintenance includes:

- Mowing of site
- Pest Control activities at site.

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8 Control Systems – Asset Maintenance

8.1 Control Systems Inspection and Testing Program

Routine inspection and testing of control systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Control systems including operator interfaces	Every 4 years	2030	RCTS3	Bay

Routine inspection and testing of control systems includes:

- Measure and adjust as necessary any VF transmit and receive levels. Investigate any persistent data error rates.
- Test capacitor bank and AVR controllers for functional operation.
- Replace internal batteries in control equipment
- Inspect operator screens for correct operation and deterioration.
- Check ABB “OFF NORMAL” list for problem points that may need attention while on site. Perform point to point test, validate, fix or raise works request to fix if unable to fix on this visit.

8.2 Ripple Control Systems – Performance Inspection and Testing Program

Routine inspection and testing of ripple control systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Ripple Control Systems including operator interfaces	Every 4 years	2010	RCTS2	Physical

Routine inspection and testing of control systems includes:

- Investigate any persistent data error rates to the controller
- Confirm GPS correct functioning with respect to time and date – no alarms
- Measure cell return currents, injection currents, and injection voltage, record in ellipse
- Confirm/Test synchronisation to surrounding controllers
- Vacuum cabinets and surrounds.

8.3 Ripple Injection Plant – Service Program

Routine inspection and testing of ripple control systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Ripple Control systems including operator interfaces	Every 4 years	1310	ZLC11	Physical

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Routine inspection and maintenance of load control equipment includes:

- Inspect tuning coils and clean
- Inspect inductor and cap banks – perform routine cap bank checks
- Sample oil in inductor – DGA
- Test functionality of injection system – use test program
- Clean and inspect firing thyristors

8.4 Control and Equipment Room – Maintenance Program

Routine maintenance in the Control Rooms and associated Equipment Rooms is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Control and Equipment Rooms OCC(N), OCC(S)	Every 6 months	2070	ZSUC6	Bay

Routine inspection and testing of control equipment includes:

- Clean and vacuum all Control Room work stations, air intakes and cabinet enclosures
- Clean and vacuum all Equipment Room cabinet enclosures, and air intakes.

8.5 RDAS Equipment Room – Maintenance Program

Routine maintenance in the RDAS Equipment rooms is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
RDAS Equipment Rooms	Every 6 months	2080	ZSUC6	Bay

Routine inspection and testing of control equipment includes:

- Clean and vacuum all work stations, air intakes and cabinet enclosures.

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9 DA001 – Protection Systems – Asset Maintenance for Bulk and Zone Substation Assets Only (S-SS-A ONLY)

9.1 Protection System, Transducer and Panel Meter Inspection Program for Assets in Bulk and Zone Substations ONLY (S-SS-A)

ISCA: In-Service Condition Assessment

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Substation (S-SS-A)	Feeder protection, transformer protection, bus protection, capacitor protection, reactor protection, SVC protection, panel meters, transducers	SSS809	0080	Conducted every 3 years

9.2 Protection System, Transducer and Panel Meter Testing Program for Assets in Bulk and Zone Substations ONLY (S-SS-A)

Routine testing of protection systems, transducer and panel meters is to be programed as follows as a combined task:

NIM: Non-Intrusive Maintenance

Level MST Applied	Assets to be Inspected	Standard Job	MST	Inspection Interval or criteria
Protection Scheme (G-PS)	Feeder protection, transformer protection, bus protection, capacitor protection, reactor protection, SVC protection, panel meters, transducers	SPS601	0060	Conducted every 6 years

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10 Protection Systems – Asset Maintenance (NOT in Bulk and Zone Substations)

10.1 Protection System Testing Program for assets not in Bulk and Zone Substations (NOT S-SS-A)

Testing of protection systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Protection systems not located in zone and Bulk Supply substations. This includes reclosers, sectionalisers and protection relays employed in distribution substations	Conducted every 4 years	2020	RPTS1	Protection Scheme

Testing of protection systems includes:

- Secondary injection tests on relays and recloser protection and control modules, timing and functional tests, including tripping and SCADA events and alarms recorded correctly locally and centrally. Also includes sectionaliser testing where such devices are fitted with Protection and Control modules.
- Replacement of internal relay batteries where fitted.

10.2 Distribution Recloser and Sectionalisher Battery Replacement Program

Automatic circuit recloser (ACR) and sectionalisers in the distribution network are to have battery replacements performed in accordance with the following standards:

- STNW1148 – Standard for SF₆ / Vacuum Automatic Circuit Reclosers and Sectionalisers, section 7 (SS)

ACR and sectionalisers battery replacements are to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Distribution Recloser and Sectionalisers – Battery Replacement	Every 3 years	3640	LSWB	Recloser Slot S-NTCBREC

Smart reclosers and sectionalisers located in Ergon Energy's area of supply are exposed to significant variations in ambient temperature and humidity and therefore are to be replaced more often than the manufacturers recommend to minimise the possibility of battery failure.

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11 Metering Systems – Asset Maintenance

Routine maintenance of Revenue Metering Systems is controlled by the National Electricity Rules and National Metrology Procedures. The Meter Asset Management Plan (MAMP) will be determined in accordance with the National Electricity Rules or an alternate plan approved by AEMO. The Intranet documents NA000900R102, NA000900R103 and NA000900R104 detail Ergon Energy's MAMP which has been approved by AEMO.

11.1 HV Meter (Revenue) Maintenance Program

Routine testing of HV revenue metering systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
HV Revenue Metering – Inspection and audit (Franchise/contestable customers, Powerlink Bulk Supply Metering etc.)	Conduct every 2.5 years	8215	MMP125	Meter Site
		8235	MMP125	

Routine inspection and audit of HV revenue metering systems includes:

- Arrange access and notify participants
- Arrange data collection prior to commencement of any work if remotely interrogated.
- Check seals and labels for tampering
- Check wiring and connections for security (i.e. tight screws, no loose strands, no insulation under terminals etc.)
- Confirm correct CT ratio by primary/secondary measurement (comparison)
- Confirm correct VT ratio by Secondary measurement
- Verify metering programs including programed meter/site multipliers
- Measure secondary voltages, currents and phase angles at Test Block
- Measure CT and VT secondary burdens
- Measure CT admittance
- Measure VT secondary wiring voltage drops
- Confirm CIS billing and Ellipse asset information (i.e. meter serial numbers, meter types, multipliers, number of dials and decimals, customer details, tariffs etc.)
- Confirm remote communications with meter (if applicable)
- Read and record meter registers (both main and alternate screens)
- Prepare reports on result of inspection/testing

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11.2 HV Meter (Revenue) Maintenance Program

Routine testing of HV revenue metering systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
HV Revenue Metering – meter accuracy tests (Franchise/contestable customers, Powerlink Bulk Supply Metering etc.)	Conduct every 5 years	8225	MMP150	Meter Site

Routine accuracy testing of revenue meters includes:

- Arrange access and notify participants
- Arrange data collection prior to commencement of any work if remotely interrogated
- Check seals and labels for tampering
- Read and record meter readings and isolate meter under test
- Confirm meter accuracy via Meter Standard and Phantom Load/Power Supply equipment.
- Test meter at Load Points specified in table Schedule 7.2.3.2/3/4/5 of the NER.
- Read and Record meter readings and return meter to service.
- Prepare test report on meter accuracy results.

11.3 HV Instrument Transformer Accuracy Testing Program

Routine testing of HV Instrument Transformers is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
HV Revenue Metering – CT and VT calibration check (Franchise/contestable customer/Powerlink where Ergon own CT's and VT's)	Conducted every 10 years	8245	MMP110	Meter Site

Note: HV Instrument Test to include all of MMP150 and confirm correct connection after Instrument Test completed.

Routine accuracy testing of HV VT's/CT's includes:

- Arrange access and notify participants
- Arrange data collection prior to commencement of any work if remotely interrogated
- Check seals and labels for tampering
- Inspection for leaks and oil levels
- Check connections for security (i.e. tightness, no loose strands, no insulation under terminals etc.)
- Confirm CT ratio's, phase errors by primary/secondary measurement
- Confirm VT ratio errors by primary/secondary measurement

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- Prepare accuracy test report on results (test certificates).

11.4 LV Revenue CT Metering Maintenance Program

Routine testing of LV CT revenue metering systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
LV CT Revenue Metering – Inspection, audit and Meter accuracy test	Conduct every 5 years	8320	MMP050	Meter Site

Routine inspection and audit of LV CT revenue metering systems includes:

- Arrange access and notify customers
- Arrange data collection prior to commencement of any work if remotely interrogated.
- Check seals and labels for tampering
- Check wiring and connections for security (i.e. tight screws, no loose strands, no insulation under terminals etc.)
- Confirm correct CT ratio by primary/secondary measurement
- Check measured ratio against meter program and CIS multiplier
- Measure metering system accuracy at the site load using nominated meter test set (load box may be used if insufficient load is available)
- Test meter at Load Points specified in table Schedule 7.2.3.2/3/4/5 of the NER
- Measure CT secondary burdens
- Measure CT admittance
- Confirm CIS billing and Ellipse asset information (i.e. meter serial numbers, meter types, multipliers, number of dials and decimals, customer details, tariffs etc.)
- Confirm remote communications (if fitted)
- Read and record meter registers (both main and alternate screens)
- Apply new seals and labels as required
- Prepare a report on inspection and test results.

11.5 LV Revenue CT Maintenance Program

The National Electricity Rules require all LV CT's used for revenue metering systems to be accuracy tested every 10 years. This testing is combined with 5 yearly CT meter accuracy testing. Intranet document NA000900R104 provides details on the Instrument Transformer Maintenance Strategy and Test Plan.

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Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
LV CT's – Inspection, audit, meter accuracy test and CT accuracy test	Conduct every 10 years	8340	MMP010	Meter Site

Note: This MST must also include CT Instrument Test MMP010 and Perform MMP050 after CT Testing.

Routine accuracy testing of LV CT's includes:

- Arrange access and notify customer
- Check seals and labels for tampering
- Check secondary connections for security (i.e. tightness, no loose strands, no insulation under terminals, etc.)
- Confirm CT ratio's, phase errors, CT burdens and measurements by using nominated CT Testing Analyser.
- Check tightness of busbar bolts (removable CT busbar)
- Prepare accuracy test report on results.

11.6 HV Meter (Statistical) Maintenance Program

Routine testing of HV statistical metering systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
High Voltage Statistical Metering – Inspection, audit and Meter accuracy checks	Conduct every 10 years	4045	MMP175	Meter Site

Routine inspection, audit and accuracy testing of statistical metering systems includes:

- Arrange access and notify participants (if required)
- Arrange data collection prior to commencement of any work if remotely interrogated.
- Check wiring and connections for security (i.e. tight screws, no loose strands, no insulation under terminals etc.)
- Confirm correct CT ratio by primary/secondary measurement or visual confirmation inspection
- Confirm correct VT ratio by secondary measurement
- Verify metering program including programed meter/site multipliers
- Measure and record secondary voltages, currents and phase angles at Test Block
- Measure CT and VT secondary burdens
- Measure VT secondary wiring voltage drops
- Confirm meter accuracy via Meter Standard and Phantom Load/Power Supply equipment
- Test meter at Load Points specified in table Schedule 7.2.3.2/3/4/5 of the NER

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- Confirm MV90 configuration data is correct (i.e. meter serial numbers, meter types, multipliers, pulse values, load profile channels, number of dials and decimals, feeder details, etc.)
- Confirm remote communications with meter (if applicable)
- Apply new seals and labels as required
- Read and record meter registers (both main and alternate screens)
- Prepare test report on results.

11.7 LV Meter (Statistical) Maintenance Program

Routine testing of LV Statistical metering systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
LV Statistical/Metering – Inspection and audit (Pole, Padmount, ADMD metering systems)	Conduct every 10 years	4040	MMP050	Meter Site

Routine inspection, audit and accuracy testing of statistical metering systems includes:

- Arrange access and notify participants (if required)
- Arrange data collection prior to commencement of any work if remotely interrogated
- Check wiring and connections for security (i.e. tight screws, no loose strands, no insulation under terminals etc.)
- Confirm correct CT ratio by visual inspection and by primary/secondary measurement if accessible and ensure meter is programed for same CT ratio
- Measure metering system accuracy at the site load using nominated meter test set (load box may be used if insufficient load is available)
- Measure CT secondary burdens
- Measure CT admittance
- Confirm MV90 and Ellipse asset information (i.e. meter serial numbers, meter types, multipliers, number of dials and decimals, customer details, tariffs etc.) if applicable.
- Confirm remote communications (if fitted)
- Perform Register Read and Load Profile read if remote communications not fitted
- Apply new seals and labels as required
- Read and record meter registers (both main and alternate screens)
- Prepare test report of inspection and result

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11.8 Data Collection Devices – Maintenance Program

Routine testing data collection systems is to be programed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job	Level MST Applied
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>				
Data collection systems – Inspection, audit and battery replacement (JR1 recorders, PQ metering, ripple signal strength monitors)	Conduct every 5 years	4060	MMP060	Meter Site

Routine inspection, audit and battery replacement of Data Collection devices includes:

- Arrange access and notify participants (if required)
- Arrange data collection prior to commencement of any work if remotely interrogated
- Confirm MV90/Multi-drive information (i.e. meter serial numbers, meter types, pulse multipliers, number of dials and decimals, LP channel details, correct feeder association / recorder alignment)
- Battery replacement
- Confirm remote communications (if fitted)

11.9 Direct Connected Metering – Maintenance Program

Routine testing of direct connected metering systems is to be programed in accordance with an in-service compliance testing program based on statistical sampling methodology as documented in document NA000900R103 – Meter Asset Maintenance Strategy and Test Plan.

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>			
Direct connected metering systems – Inspection and meter replacement	In accordance to AEMO and Ergon Energy sampling requirements	N/A	Technical Specification

Ergon Energy's strategy for Direct Connected Metering will be to use a sampling plan based on "Australian Standard AS1284.13 – In-service Compliance Testing" and Clause 2.6 of the National Metrology Procedures for Meter Types 5 and 6.

Direct Connected Meters have no routine maintenance carried out in the field that can be triggered on a routine basis. Due to the large quantities of these meters in service, the accuracy of a meter family is determined by in-situ testing based on a sample size determined by the total meter family population. The sample testing is based on Australian Standards AS1284.13 using inspection by attributes. The results of these tests then determine if a meter population is non-compliant and needs to be replaced using a bulk meter replacement program, or the meter family is compliant for a defined period before further testing is needed. Meter families may be divided into sub-populations to limit the impact of having to replace a very large meter population. The minimum testing requirements are specified in Australian Standard AS1284.13.

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11.10 Receiving Inspection Sample Program

Receiving Inspection Samples are to be programmed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>			
All Meter Equipment deliveries	Conduct on receipt of delivery		Various RITI's

The increased use of electronic meters with complex labelling and programming functionality, places additional requirements on Ergon's Meter Provider to ensure delivered meter equipment meets installation and tariff requirements. A minimalist receiving inspection/testing inspection (RITI) process has been introduced to visually inspect each incoming delivery of metering equipment against RITI criteria, at each stores location. Additional electrical tests will be conducted at the Rockhampton store where Laboratory facilities exist. These inspection and tests are intended to check that delivered products meet contractual requirements. Quality Assurance tests are to be part of Suppliers requirements.

11.11 Ripple and Time Control Device Maintenance Program

Ripple and Time Control Device Maintenance is to be programmed as follows:

Assets to be Inspected	Inspection Interval or criteria	MST	Standard Job
<i>Regulated Network, Unregulated Network and Isolated Generation Network</i>			
Ripple and Time Control Devices	3000 per year	N/A	Technical Specification