



Murra Warra Wind Farm Bushfire Mitigation Plan (BMP) (2022-2023)

Electricity Safety (Bushfire Mitigation) Regulations
2013



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Document Revision History

Version	Release Date	Reviewer	Description
1.0	30.6.20	Duncan Alexander	Based on V5 of 2013 Regulations
2.0	23.11.20	Duncan Alexander	Amended as per ESV Evaluation report (CM-10169).
3.0	25.10.21	Tanya Jackson	For 2022 Season
4.0	26.11.21	Duncan Alexander	Add MW2 At Risk Assets plus minor Amendments and review of reference documentation/links.
5.0	30.06.22	Duncan Alexander	Review prior to submission for 22-23 season
6.0	23.09.22	Duncan Alexander	Amended as per ESV Evaluation report (CM-12007).

Document Approval

Name / Originator	Description	Date	Signature
Duncan Alexander	Author	23.09.22	
Tanya Jackson	Reviewer/Authoriser	23.09.22	

Applicable Sites

Murra Warra Wind Farm (Stage 1)

The land on which Murra Warra Wind Farm (MWWF) and its associated overhead line is established consists of agricultural land predominantly used for cropping. There are trees within the boundaries of the wind farm however there are none in close proximity of the turbines or substations and all overhead lines are kept clear according to Electricity Safety (Electric Line Clearance) Regulations 2015.

It is recognised that there are multiple electrical assets located at the Murra Warra Wind Farm where fire could originate from, including;

- I. The wind turbine nacelle,
- II. The Integrated Grid Connection Transformer and Switchgear inside each wind turbine,
- III. The ≈3km of single and dual circuit 33kV overhead line mounted on 44 steel monopoles between the turbines and MWWF Switchyard (At-Risk Electric Lines), and
- IV. The Murra Warra Wind Farm (MWWF) Switchyard.

Murra Warra Wind Farm (Stage 2)

The land on which Murra Warra Wind Farm (MWWF2) and its associated overhead line is established consists of agricultural land predominantly used for cropping. There are trees within the boundaries of the wind farm however there are none in close proximity of the turbines or substations and all overhead lines are kept clear according to Electricity Safety (Electric Line Clearance) Regulations 2015.

It is recognised that there are multiple electrical assets located at the Murra Warra Wind Farm where fire could originate from, including;

- I. The wind turbine nacelle,
- II. The Integrated Grid Connection Transformer and Switchgear inside each wind turbine,
- III. 4km and 3km of dual circuit overhead lines mounted on 42 pole sets between the turbines and MWWF2 Switchyard (At-Risk Electric Lines), and
- IV. The Murra Warra Wind Farm 2 (MWWF2) Switchyard and synchronous condenser.

At-Risk Electric Lines

Murra Warra (Stage 1) Electric Lines

The internal overhead electric lines described in Stage 1 point iii. above are owned by Murra Warra Project Co and are located to the east of the MWWF Switchyard and 220kV Murra Warra Terminal Station (MRTS) and who's performance and compliance is ensured through the implementation of both this plan and the Electric Line Clearance Management Plan. They are steel pole, single and double circuit lines approximately 3 km in length and require vegetation management processes to maintain the clearance space around them. Siemens Gamesa Renewable Energy (SGRE) GmbH has been engaged as the main Operations and Maintenance provider for the Wind Farm.

Murra Warra (Stage 2) Electric Lines

The internal overhead electric lines described in Stage 2 point iii. above are owned by Murra Warra Project Co and are located to the north and east of the MWWF2 Switchyard and 220kV Murra Warra Terminal Station (MRTS) and who's performance and compliance is ensured through the implementation of both this plan and the Electric Line Clearance Management Plan. They are a pair of steel pole, double circuit lines approximately 3 km and 4km in length, respectively, and require vegetation management processes to maintain the clearance space around them. GE Renewable Energy Australia has been engaged as the main Operations and Maintenance provider for the Wind Farm Stage 2.

Electricity Safety (Bushfire Mitigation) Regulations 2013)

Regulation 6 - Prescribed particulars for the bushfire mitigation plans – specified operators

Murra Warra Find Farm (Stage 1)

(a) The name, address, and telephone number of the specified operator:

Mr. Anthony Berzi (Authorised Representative of Murra Warra Project Co)
Operations Manager
RES Australia Pty Ltd
Level 6, 165 Walker Street
North Sydney, NSW, 2060
(02) 8440 7400

(b) The person responsible for the preparation of this plan is:

Mr. Duncan Alexander
Plant Performance Manager
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Level 7, 379 Collins Street
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(c) The person responsible for carrying out the plan is:

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Service Manager
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885 Mountain Highway
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(d) In case of an emergency contact should be made with:

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Siemens Gamesa Renewable Energy
Alisa Wheat Road
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+49 (0) 4331 837 3333 (SGRE 24/7 Turbine Control Centre)
Mobile +61 482 952 782 (Ashley Marra)

Murra Warra Find Farm (Stage 2)

(a) The name, address, and telephone number of the specified operator:

Mr. Anthony Berzi (Authorised Representative of Murra Warra Project Co)
Operations Manager
RES Australia Pty Ltd
Level 6, 165 Walker Street
North Sydney, NSW, 2060
(02) 8440 7400

(b) The person responsible for the preparation of this plan is:

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(c) The person responsible for carrying out the plan is:

Mr. Sam Kelly
Lead Service Technician
GE Renewable Energy Australia
Alisa Wheat Road
Murra Warra, VIC, 3401
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Mobile +61 407 924 933

(d) In case of an emergency contact should be made with:

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Lead Service Technician
GE Renewable Energy Australia
Alisa Wheat Road
Murra Warra, VIC, 3401
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Mobile +61 407 924 933 (Sam Kelly)

(e) Policy

To mitigate as far as practicable the risk of fire starting from those at-risk assets at Murra Warra Wind Farm.

(f) Objective/s

This Plan in conjunction with the sites Electric Line Clearance Management Plan has been developed with the main objective to;

- identify possible ignition sources that could cause fire, and
- mitigate/reduce the likelihood and consequences of these through the implementation of effective preventative measures.

The plan is also intended to fulfil the Legislative and Regulatory requirements of the;

- Electricity Safety Act 1998, and
- Electricity Safety (Bushfire Mitigation) Regulations 2013 (Version 005).

(g) Maps

Refer to Appendices for the following map of the land and location of at-risk electric lines

- Murra Warra Wind Farm (Stage 1) Overhead Line – Site Layout (HBRA Classified)
- Murra Warra Wind Farm (Stage 2) Overhead Line – Site Layout (HBRA Classified)

(h & i) Preventative Strategies

In line with this plans objectives the strategies adopted for the prevention of fire ignition from overhead lines are detailed in this section.

- i. Scheduled 36 month Electric Line Asset Inspection. This will be done by the contracted asset inspectors following their Policies or Standard Operating Protocol (SOP) such as Powercor's 'Policy No 5 – C001.A-025 – Priority Policy' or AusNet's 'SOP 70-01' such that the reports stemming from these inspections identify, code and prioritise defect/s and their rectification timings (refer to Figure 1 below).

Allocation	Symbol	Allocated to items assessed to be at risk of failure within the following timeframes	Need to be actioned within
Priority 1	P1	0 – 28 days	24 hours
Fault Follow Up 14 Days	FFU14	> 14 days	14 days
Fault Follow Up 28 Days	FFU28	> 28 days	28 days
Priority 28	P28	28 days - 32 weeks	28 days
Priority 2	P2	32 weeks – 3 years	32 weeks
Priority 3	P3	3 - 5 years	3 years

Figure 1 Asset Defect Priority Rating and Rectification Timings

Note: all time periods mentioned in the table are based on calendar days.

There can be a 2-3 week delay between inspection and provision of report and associated recommendations.

If pole/s are identified as part of the inspection with deteriorating defects, however;

- they have not exceeded the criteria under sections (f) to (j) to trigger replacement, and/or
- the inspector expects that deterioration will cause the pole to have a 'limited life (L)' or to become 'unserviceable (U)', as per definitions in AS4676:2000, during the following scheduled inspection interval then an increased inspection/testing interval can either be;
 - a. specified as part of the scheduled inspection (and associated report), or
 - b. requested of the Asset Inspector by the responsible person for carrying out this plan,

to track further deterioration.

The priority that is assigned to a 'serviceable (S)', 'limited life' or 'unserviceable' pole is independent the assignment and should be linked back to the Inspectors assessment of the risk of failure within the timeframes referred to in Figure 1.

Any increased inspection interval will be calculated using previous deterioration information/rates, if available, from previous inspection results. If no historical deterioration information/rates are available then the increased interval will default to annual.

- ii. Scheduled 12 month Visual Patrol of Electric Lines (including insulators and surge arrestors, earth tails to poles) for defects and potential failure points,
- iii. Thermographic Patrols as required. This is an unplanned/non-routine task which will be largely dependent on the person responsible for carrying out the plan and if they deem necessary to carry out this action based on fault event logs and known Electric Line condition,
- iv. Scheduled 5 yearly Insulator washing. This is dependent on the local conditions and subsequent impact of these on sections of the overhead lines, and
- v. the auto reclose functionality is currently suppressed on the power lines and the lines are inspected prior to re-energising after faults.

(j) Qualifications, Experience and Competency of persons

Personnel completing asset inspections (Asset Inspector, Auditor 'General') will hold current qualifications approved by ESV.

The qualifications, training and experience required to be current includes, but is not limited to;

- Certificate II in ESI Asset Inspection (JET20612),
- Apply ESI safety rules, codes and procedures for work on or near electrical apparatus (JETDRRF01B),
- Prepare to work safely in the construction industry (CPCCOHS1001A),
- Provide cardiopulmonary resuscitation (HLTAID001), or
- Provide first aid in an ESI environment,
- Safe Approach Distances,
- Control traffic with stop-slow bat, (RIIWHS205D)
- Implement traffic management plan, (RIIWHS302D)
- Manual Handling,

- Safe to Approach SWER,
- VESI Environmental Framework,
- VESI Safety Framework,
- Enter Enclosures,
- ESI Worker Card, and
- Network Operator Induction

to comply with this approved plan the [VESI Skills and Training Guideline](#), [VESI Skills and Training Matrix](#) and the Code.

The training records from the Asset Inspector will be made accessible via the individuals [Australian ESI Skills Passport](#) or other means (eg, email) prior to commencement of works. A SGRE Representative will be on site at the commencement of the inspections/clearance to observe/conduct appropriate inductions which may include such a request for records.

If any worker associated with the Electric Lines and tasks covered under this plan are found to be performing works without required training/qualifications/experience or outside of their capabilities or the prescribed documentation they are supposed to be working under then work will be immediately stopped and the associated personnel removed from the site.

(k) Qualifications, Experience and Competency of other persons

Those persons (other than persons referred to in paragraph (j)) (eg, Line workers, Communications workers or Vegetation Assessors, Cutter working from EWP, Ground Crews, Specialist Plant Operators, Tree Climbers, etc), must hold current qualifications approved by ESV.

Dependant on the work required the qualifications and experience that will be required to be current may include;

- Certificate II in ESI Powerline Vegetation Control
- (Arborist only) A National Certificate Level IV in Horticulture and Arboriculture (including 'Assess Trees' module) (UET20312), or equivalent, and
- (Arborist only) A minimum of 3 years field experience,
- Apply Occupational Health and Safety regulations, codes and practices in the workplace
- Comply with sustainability, environmental and incidental response policies and procedures
- Working safely near live electrical apparatus as a non-electrical worker
- Operate and maintain chainsaws
- Plan the removal of vegetation up to vegetation exclusion zone near live electrical apparatus
- Monitor safety compliance of vegetation control work in an ESI environment
- Apply pruning techniques to vegetation control near live electrical apparatus
- Recognise plants
- Apply ESI safety rules, codes and procedures for work on or near electrical apparatus
- Prepare to work safely in the construction industry
- Provide cardiopulmonary resuscitation
- Provide first aid in an ESI environment
- Safe Approach Distances - Vegetation Work
- Manual Handling

- Control traffic with stop-slow bat, (RIIWHS205D)
- Implement traffic management plan, (RIIWHS302D)
- VESI Environmental Framework,
- VESI Safety Framework,
- ESI Worker Card, and
- Network Operator Induction

to comply with this approved plan the [VESI Skills and Training Guideline](#), [VESI Skills and Training Matrix](#), [Vegetation Management Guideline](#), [Vegetation Skills and Training Matrix](#) and the Code.

The training records from the other worker will be made accessible via the individuals [Australian ESI Skills Passport](#) or other means (eg, email) prior to commencement of works. A SGRE Representative will be on site at the commencement of any work to observe/conduct appropriate inductions which may include such a request for records.

If any worker associated with the Electric Lines and tasks covered under this plan are found to be performing works without required training/qualifications/experience or outside of their capabilities or the prescribed documentation they are supposed to be working under then work will be immediately stopped and the associated personnel removed from the site.

(l) Operation and Maintenance Plans

There are no dedicated operation and maintenance plans for the at risk electric lines however any/all requests made, or support required, by the CFA or any other emergency services of the Wind Farm to minimise risk of fire will be followed.

i. In the event of fire

In the event of fire which prevents the safe operation of the at-risk electric lines they will be de-energised to minimise further ignition sources.

Where the fire is in the area but presents minimal or no risk to the safe operation of the electric lines it will continue to operate with the auto reclose suppressed.

ii. During a Total Fire Ban (TFB)

During a time of total fire ban the at-risk Electric lines will operate in accordance with normal operating practices (auto reclose suppressed) unless requested otherwise by the CFA or other emergency services. The SGRE Site Manager shall maintain watch of weather and in the event of a warning or emergency services request, the Site Manager shall act in accordance with the warning advice or request.

iii. During the Fire Danger Period

The Wind Farm will be operated in accordance with normal operating practices (auto reclose suppressed) during the DFDP unless requested otherwise by the CFA or other emergency services. SGRE required a Hot Work Permit be issued during these periods.

(m) Investigations, analysis and methodology

Electrical events/faults, if they influence risk of fire ignition from the sites at-risk electric lines or not, are recorded and reported by SGRE which if considered to be a 'serious electrical event' are reported separately to ESV and/or WorkSafe Victoria.

For faults/incidents/defects requiring further investigation a Non-Conformance Report (NCR) raised. This process may also instigate a Diagnostic Report if there have been a sufficient number of identical/similar events (common/systemic Defect or fault).

This process helps to ensure that events/faults are properly reported, investigated and actions taken to reduce their likelihood of re-occurring.

There were no fires that started due to the at-risk electric line in the previous plan period.

(n) Processes and Procedures

There are a number of processes and procedures adopted/relied upon to manage this plan including:

- i. Monitoring the implementation of the plan is performed predominantly through the following method;
 - the use and management of the Computerised Maintenance Management System (CMMS) which records any required scheduled or unscheduled works including, but not limited to, the preventative works listed under section (h & i) of this plan. The specific measure is the closure of maintenance work orders related to bushfire mitigation and line vegetation works.

This measure is referred to as the Bushfire Index and is calculated as follows:

$$\text{Bushfire Index} = \text{Number of outstanding Tasks} \div \text{Total due Tasks}$$

Tasks include all line inspection/clearance works, both scheduled and unscheduled.

The current '**outstanding tasks**' include:

MURRA WARRAWIND FARM (STAGE 1)

- o There are no outstanding/overdue works for this site

The '**tasks required**' include:

MURRA WARRAWIND FARM (STAGE 1)

- o Powerline Bushfire Vegetation Inspection/Clearance (Scheduled, annually due in the CMMS in September)
- o 36 month Electric Line Inspection (next due: April 2022)
- o Audit of Bushfire vegetation line inspection/clearance

Therefore:

$$\text{Bushfire Index} = 0 \div 3 = 0$$

The current '**outstanding tasks**' include:

MURRA WARRAWIND FARM (STAGE 2)

- o There are no outstanding/overdue works for this site

The '**tasks required**' include:

MURRA WARRAWIND FARM (STAGE 2)

- Powerline Bushfire Vegetation Inspection/Clearance (Scheduled, annually due in the CMMS in September)
- 36 month Electric Line Inspection (next due: November 2024)
- Audit of Bushfire vegetation line inspection/clearance

Note that the performance/progress of all site maintenance tasks, including the above where applicable, is monitored and reported on monthly by the Australian Operations Department.

Other performance measures which will be collated and reviewed annually prior to the resubmission of this plan to ESV include;

Key Performance Indicator (KPI)	Target	Result (previous year)
Number of electrical events/faults that have occurred on the relevant Electric Lines with the cause identified to be directly related to their condition and/or compliance with the Regulations.	0	0
Annual Number of Fire Starts.	0	0
Number of Stakeholder complaints/correspondence received in relation to the relevant Electric Lines as measured through Murra Warra Wind Farms Communication and Stakeholder Representative and the associated enquires line (1800 940 487) and email address (info@murrawarra-windfarm.com).	0	0
Lost Time Injuries (LTI's) or Medical Treatment Injuries (MTI's) with the cause identified to be directly related to the Electric Lines.	0	-
Future BMP submitted by 30th June each year	Yes	No*
Financial Penalties (Penalty Units) received.	None	-

*Submitted 1/07/22.

- ii. Auditing the implementation of the plan is largely done in two ways;
 - as part of the annual review process prior to resubmission of this plan to ESV, and
 - an audit post the DFDP will be undertaken by a representative responsible for carrying out this plan which includes;
 - a. that the qualifications and experience of personnel performing any scheduled inspection and/or clearance works adheres to both ESV's and this plans requirements,
 - b. associated report/s have been submitted to the persons responsible for carrying out this plan,
 - c. all inspection/s, report/s and subsequent recommendations from have been conducted in line with the scope/timing of recommendations and to the quality of this plan and the applicable Acts, Regulations, Codes and Standards as further explained under section (vi). **Note that this task may be conducted by an independent third party where requested by the persons responsible for carrying out this plan.** Additional inspections may take place throughout the year if in alignment with other

scheduled/unscheduled line tasks (eg, insulator washing, event/fault inspections etc), and

d. the inspections and recommendations/works from the report, if any, have an appropriate task/s entered into the CMMS and those task/s have been closed out following completion of the works.

If either of items a, b, or c in above list are believed to have not occurred then a representative responsible for carrying out this plan is to immediately contact the Asset Inspection of the reports and request the required information

If either of the remaining items in above list have not occurred then the representative responsible for carrying out this plan is to immediately perform the required work or contact their manager and request support to perform the work.

Person/s responsible for carrying out this plan may also take the opportunity to perform audits outside the above timeframe.

- iii. Identification of any deficiencies in the plan or the plan's implementation can be done via;
 - the annual review process of this plan prior to resubmission to ESV,
 - Person/s carrying out this plan to provide feedback to their manager and/or the person/s responsible for the preparation of this plan when a deficiency is found. This will generally take the form of email correspondence,
 - Safety or Hazard Observations, and/or
 - Review of site/asset risk register.
- iv. A change, or changes, to the plan and the plan's implementation if any deficiencies are identified under subparagraph (iii) are performed during the annual review of this plan prior to resubmission to ESV. If there are more critical changes required to important information, including but not limited to, contact details or applicable procedures/policies these will be performed as soon as possible and resubmitted to ESV. The updated plans will then be reloaded onto the webpages listed in the plan.

The annual review of this plan is performed by the person/s responsible for preparing the plan in conjunction with the other people listed under sections (a-d). As well as incorporating any of the above changes the reviews intention is to, but is not limited to, re-aligning the plan to any updated Legislation, Regulations or Codes, industry practices and Electric Line configurations/locations.

- v. Monitor the effectiveness of inspections under the plan will be performed through the annual review of the performance measures listed under (n)(i) by the person/s responsible for preparing the plan.
 - vi. Auditing the effectiveness of any inspections carried out under the plan is performed through conducting a ground based visual audit following the completion of the 36 month Electric Line Inspection works. This will be performed by either;
 - Personnel who have;
 - Knowledge of applicable Acts, Regulations and Codes associated with this plan,
 - Knowledge of this plan and its auditing obligations,
 - Knowledge of , and are familiar with, the Electric Lines subject to the audit, and
 - A minimum of 3 years Electric Line management experience
- or,
- an independent third party.

The scope of the visual audit will cover a minimum of **10%** of the Electric Line spans previously inspected and take the form of a marked-up version of the inspection report or an I-Auditor checklist. If any significant inaccuracies are noted then the audit scope will be expanded to include 100% of the Electric Lines. These inaccuracies will then be reported back to the Asset Inspector.

Person/s responsible for carrying out this plan will also take the opportunity to perform audits outside the above timeframe if other scheduled/unscheduled line works are expected and resourcing is available.

(o) Policy on Assistance Provided to Fire Control Authorities

Access to site and any requests for assistance from fire control authorities in the investigation of fires at or near the relevant Electric Lines will be provide.

Regulation 13 - Exemptions

No exemptions were requested or issued by ESV from any of the requirements of the regulations.

Section 83BA (3) (a) of the Act - Plan available for inspection

The latest ESV approved Bushfire Mitigation Plan is available for inspection on the responsible person's website at;

<http://murrawarrawindfarm.com/wp-content/uploads/2021/02/Murra-Warra-Bushfire-Mitigation-Plan-20-21.pdf>

Any superseded versions of the plan located at the above websites will be overwritten by the person responsible for preparing the plan once an updated version of the document has been approved/accepted by ESV.

A hardcopy of the ESV approved/accepted Bushfire Mitigation Plan mentioned above is available for inspection at the responsible person's office, during normal business hours, located at;

RES Australia Pty Ltd

Level 7, 379 Collins Street

Melbourne, VIC, 3000

Appendices

- (A) Murra Warra Wind Farm (Stage 1) Overhead Line – Site Layout (Lines) (HBRA Classified)
- (B) Completed Inspection and Test Plans (Poles and Stringing)
- (C) Murra Warra Wind Farm (Stage 2) Overhead Line – Site Layout (Lines) (HBRA Classified)
- (D) Completed Inspection and Test Plans (Poles and Stringing)

Appendix A: Murra Warra Wind Farm (Stage 1) Overhead Line - Site Layout (Lines) (HBRA Classified)

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Appendix B: Completed Inspection and Test Plans (Poles and Stringing)
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Appendix C: Murra Warra Wind Farm (Stage 2) Overhead Line - Site Layout (Lines) (HBRA Classified)
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Appendix D: Completed Inspection and Test Plans (Poles and Stringing)
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