

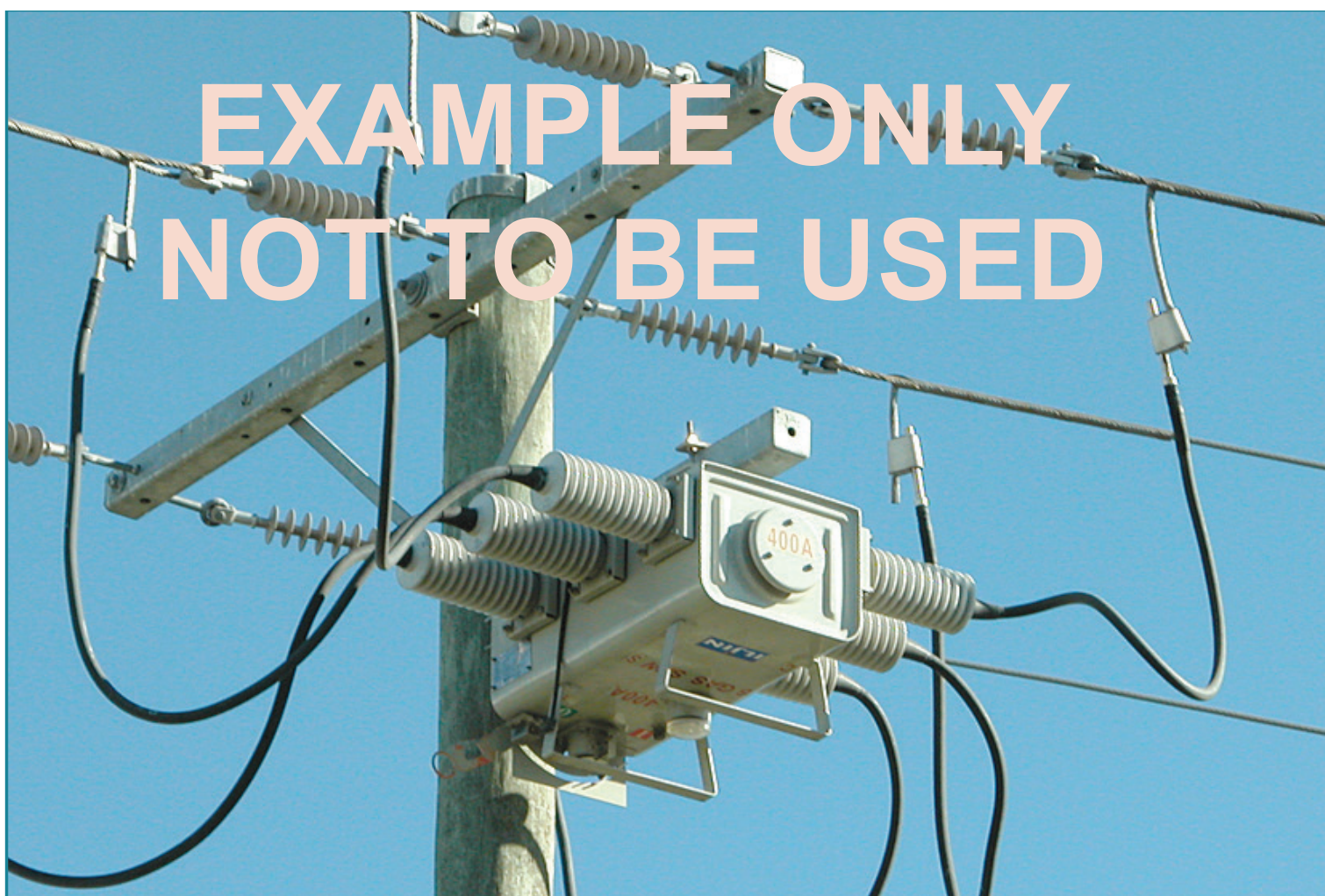
**HV OPERATOR TRAINING**



**DISTRIBUTION SWITCHING  
OVERHEAD**

**DSO** LOG BOOK

**EXAMPLE ONLY  
NOT TO BE USED**



*Enabling the establishment, consistency and portability of agreed industry standards across  
the Victorian Electricity Supply Industry*

**TRAINEE NAME**

Name

Issue date

**EMPLOYER****MANAGER APPROVAL**

Name

Signature

Issue date

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## INTRODUCTION

This Log assists the trainee in documenting evidence of the practical (on-the-job) component of HV Switching to enable them to be assessed for authorisation to perform Distribution Switching Operations (DSO) on the Victorian Electricity Supply Industry (VESI) High Voltage Distribution Network.

All items listed in the Log shall be completed and submitted to the Distribution Network for assessment with all accompanying evidence within 6 months or as stipulated by the Distribution Network.

### Accompanying evidence

- A diary recording a brief account of daily activities and any fault switching carried out.
- All Access Authorities, Applications and Switching Instructions associated with the trainee's switching tasks.

## PRE-REQUISITES

Participants shall have completed initial training as stipulated in the VESI Skills and Training guideline for High Voltage Switching – DSO and hold a current RSO Authority.

## SCOPE

Perform High Voltage Switching, Earthing and issue Electrical Access Authorities on:

- All distribution overhead field apparatus

DSO excludes metal enclosed switch gear and the underground network.

## USE OF LOG BOOK

- The trainee completing this Log shall be under the guidance of a mentor.
- The trainee shall carry the Log Book at all times during the training period and have the mentor print, sign and date when applicable.
- The mentor shall print their name, sign and date specific items when they have assessed that the trainee has a complete understanding of the task.
- The trainee shall remain under the direct supervision of the mentor whilst they are switching on the VESI network as a DSO in Training.

## ROLES AND RESPONSIBILITIES

### Employer

- Shall ensure mentoring of trainees is carried out by a person that is competent and authorised to carry out the work.
- Provide suitable tools, equipment and vehicles for the tasks being undertaken.
- Monitor trainee progress.
- Ensure that the Log Book is completed correctly and signed off prior to assessment by the Distribution Network.

### Team Leader/Supervisor

- Appoint mentor that is competent to carry out the work.
- Assist with the planning and scheduling of DSO class operator work.
- Ensure that suitable tools, equipment and vehicles are available for use.
- Ensure that the Log Book is completed correctly and signed off. Submit the Log Book and accompanying evidence to the Distribution Network's responsible person for review and verification **prior** to the assessment.

### Mentor

- Work with the trainee at all times, reviewing the work practices and standards of the trainee's tasks/work.
- Maintain direct visual and audible contact of the trainee whilst they are switching on a network.
- Forward planning and scheduling of appropriate DSO class switching activities.
- Ensure that the Log book is completed correctly and signed off prior to assessment by the Distribution Network.

### Trainee

- Maintain an up to date Log Book and provide evidence of activity completion as described in the Log Book.
- Record in a diary a brief account of daily activities and any fault switching carried out.
- Gain the experience and knowledge required.
- Ensure that the Log Book is completed correctly and signed off prior to assessment by the Distribution Network.

**1. SAFETY REQUIREMENTS**

**Correct Personal Safety Equipment (PPE) eg.:**

Hard Working Gloves, Hearing Protection, Safety Glasses, Safety Harnesses, Safety Helmets, Safety Boots, Pole Top Rescue Kit and Personal Tool Kit.....

**Correct Operating Equipment:**

Insulated Gloves (HV), Insulated Gloves (LV), Insulated Sleeve (HV), Insulated Mat (HV), Operating Sticks, Modiewark, Approved Earth & Short Circuits.....

**Conduct risk assessment of the work environment incorporating:**

Personal safety (operator safety), work crew safety, SWMS & JSEA and public safety.....

**2. PROCEDURES**

**Reference Manuals:**

Knowledge of and understands the use of your Distribution Network's Operations and Distribution Switchgear Manuals, and VESI Fieldworker Handbook and Green Book.....

**Apparatus Labelling and Numbering:**

Understands use of Pole/Lis Numbers, Switch Numbers, Cable Labels and Substation Names in relation to Underground Network. ....

**Access Authorities:**

Has written, issued and cancelled a minimum of the following Access Authorities and can provide copies:

- Electrical Access Permit (EAP) x 5.....
- Sanction for Test (SFT) x 1 (Overhead ABC).....
- Verbal Statement of Condition of Apparatus Plant (VSCAP) x 2.....
- Statement of Condition of Apparatus Plant (SCAP) – Understands protocols with issuing/cancelling SCAP arrangements with High Voltage customers and other distribution networks.....
- Personal Safety & Service Clearance (PSSC) x 1.....

**Communication:**

Understands correct protocols used to communicate with Control Centre, other Operating, Contracting and Emergency personnel, Work Crews and the general public.....

**Feeder paralleling / phase angle calculations:**

- Understands load transfer requirements and local and inter-station parallels.....
- Understands HV field parallels in relation to Bus Tie Open Schemes (BTOS).....

**Sub-transmission:**

- Understands Sub-transmission Line / Circuit identification methods.....
- Understands Sub-transmission Earthing Procedures.....
- Understands Network Control Centre protocol in relation to Sub-transmission VSCAP arrangements.....

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**2. PROCEDURES CONTINUED**

**Earthing Procedure:**

- Understands Safe to Earth Test, Priority Earthing, Discharging, Application/Technique, Operational Earthing (Point of Access to all sources of Supply).....

**Commissioning New Equipment**

- Checked Labelling .....
- Received PSSC (Clearance Procedure).....
- Performed HV and LV Phase Outs .....
- Performed Phase Rotation & Voltage Testing.....

**Operating Instructions:**

Understands use for:

- Planned Work .....
- Unplanned Work .....
- Faults and Emergency .....
- Tick & Cross Check .....
- Outcomes / Consequences of Operating Steps .....

**Control Centre Familiarisation/Visit** (optional as directed by Distribution Network)

Understands Control Centre Planned Work processes including communicating red marking of instructions to operators .....

**Tags**

Has correctly identified or can demonstrate the correct application and functions of the following tags associated with Access Authorities

- Caution Under Access Authority .....
- Caution Re-Operation (CRO) .....
- In-operable .....

**Ferroresonance: (See Appendix A)**

Demonstrated an understanding of what constitutes a possible ferroresonant circuit and how to minimise risks of de-energising / re-energising possible ferroresonant circuits on single phase switchgear.....

**3. PROTECTION SYSTEMS, FUNCTIONS & FAULT LOCATION**

**Fault Location and Analysis:**

- Involvement in fault activity and restoration.....
- Use of diagrams.....
- Direction from Control Centre .....
- Fault Indicators .....
- Other Operating Personnel .....
- Co-ordination and communication with Emergency Services.....

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**4. SWITCHING/OPERATING**

**HV Distribution Line Capacitors:**

- Performed Switching, Isolation, Earthing and Restoration. ..
- Understands controller types e.g. fixed, temperature, timed and VAR.....

**Automatic Gas Switches & Control Boxes:**

Performed Suppression of Remote Control, Disabling, Opening & Closing of Switch (Manually & Control Box).....

**Automatic Circuit Reclosers & Control Boxes:**

- Understands suppression of remote control, auto reclose, earth leakage and opening and closing of the ACR.....
- for eg.:
- Remote controlled ACR electronic control boxes .....
  - Remote Controlled SWER ACR electronic control box.

**HV Distribution Regulators**

Has an understanding of their operation: .....

**HV Customer Networks**

Has operated or is able to demonstrate an understanding: ....

EXAMPLE ONLY

**5. CO-GENERATION SITES (NETWORK IMPACTS)**

- Familiar with Co-Gen sites.....
- Understands shifting/moving Co-Gen tags on open points .....

# Appendix A

## WHAT IS FERRORESONANCE ?

Ferroresonance causes an unstable **VOLTAGE** situation. The voltages that can occur may far exceed the voltage rating of the HV equipment (up to 7 times).

## WHEN CAN FERRORESONANCE OCCUR?

Ferroresonance can occur when the capacitance of an **insulated cable** (HV U/G, or HVABC) and the inductance of a **transformer** (anywhere within the switching zone) are energised, or de-energised as a combination, on a **single phase switching device** (HV fuses, or isolators).

## WHAT CAUSES FERRORESONANCE ?

Ferroresonance is caused when the capacitance of an **insulated cable** (HV U/G, or HVABC) **and** the inductance of a **transformer** (anywhere within the switching zone) become “tuned” or “matched” to each other and are energised, or de-energised as a combination, on a **single phase switching device** (HV fuses, or isolators). This causes a resonating effect between the inductive and capacitive voltages, which can produce voltages up to 7 times the operating voltage.

## EXPERIENCING FERRORESONANCE IN THE FIELD

If ferroresonance occurs in the field, some of the following events may happen:

- The single phase switching device **you** are using may **flash-over**.
- The ACR or CB may operate.
- The LA's or HV equipment may be damaged.

## OPERATING AROUND FERRORESONANCE

Once you have identified the **possibility** of ferroresonance, you should use the following steps:

1. Energise or de-energise the switching zone (combination) on a gang operated switch.
2. Contact the Control Room for instructions.

**NOTE:** A load-buster tool is **ONLY** for breaking current and cannot be used for ferroresonance because it is a voltage situation.



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# STATEMENT OF NOMINATION FOR HV OPERATOR AUTHORISATION

I / we recommend that (Name of Trainee)

.....

be assessed for authorisation for High Voltage Operator Level

## **DISTRIBUTION SWITCHING OVERHEAD DSO**

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	Name	Signed	Date
Mentor/s			

Supervisor			
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Manager			
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