

HV OPERATOR TRAINING



DISTRIBUTION SWITCHING

DS LOG BOOK



*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

**EXAMPLE ONLY
NOT TO BE USED**

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 High Voltage Electrical Switching Operations (DS) on metal enclosed switchgear and the underground network 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 12 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.

SCOPE

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

- All field apparatus, including metal enclosed switchgear and the underground network

PRE-REQUISITES

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

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 operating on a network as a DS in training.

ROLES AND RESPONSIBILITIES

Employer

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

Team Leader/Supervisor/Manager

- Appoint mentor that has current training and authorisation to carry out the work.
- Assist with the planning and scheduling of DS 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 & audible contact with the trainee whilst they are switching on a network.
- Forward planning and scheduling of appropriate 'DS' 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.

TRAINING	MENTOR NAME	SIGN	DATE
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 <input type="checkbox"/>			
Correct Operating Equipment: Insulated Gloves (HV), Insulated Gloves (LV), Insulated Sleeve (HV), Insulated Mat (HV), Operating Sticks, Modiewark, Approved Earth & Short Circuits..... <input type="checkbox"/>			
Conduct risk assessment of the work environment incorporating: Personal safety (operator safety), work crew safety, SWMS & JSEA and public safety..... <input type="checkbox"/>			
2. PROCEDURES			
Control Centre Familiarisation/Visit <small>(optional as directed by Distribution Network)</small> Understands Control Centre planned work processes including communicating red marking of instructions to operators <input type="checkbox"/>			
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 <input type="checkbox"/>			
Apparatus Labelling and Numbering: Understands use of Pole/Lis Numbers, Switch Numbers, Cable Labels and Substation Names in relation to Underground Network. <input type="checkbox"/>			
Operating Instructions: Understands use of: <ul style="list-style-type: none"> • Planned Work <input type="checkbox"/> • Unplanned Work <input type="checkbox"/> • Faults and Emergency <input type="checkbox"/> • Tick & Cross Check <input type="checkbox"/> • Outcomes / Consequences of Operating Steps <input type="checkbox"/> 			
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..... <input type="checkbox"/>			
Tags Has correctly identified or can demonstrate the correct application and functions of the following tags associated with Access Authorities <ul style="list-style-type: none"> • Caution Under Access Authority <input type="checkbox"/> • Caution Re-Operation (CRO) <input type="checkbox"/> • In-operable <input type="checkbox"/> 			

TRAINING	MENTOR NAME	SIGN	DATE
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<p>Access Authorities: Written, issued and cancelled a minimum of the following Access Authorities and can provide copies:</p> <ul style="list-style-type: none"> • Electrical Access Permit (EAP) x 10 <input type="checkbox"/> • Sanction for Test (SFT) x 2 <input type="checkbox"/> • Permit to Work (PTW) x 2 (or understanding of) <input type="checkbox"/> • Verbal Statement of Condition of Apparatus Plant (VSCAP) x 2 <input type="checkbox"/> • Statement of Isolation of Low Voltage (SILV) x 1 (or understanding of)..... <input type="checkbox"/> • Personal Safety & Service Clearance (PSSC) x 2..... <input type="checkbox"/> 			
<p>Earthing Procedure: Understands Safe to Earth Test, Priority Earthing, Discharging, Application/Technique, Operational Earthing (Point of Access to all sources of Supply). <input type="checkbox"/></p>			
<p>Commissioning New Equipment:</p> <ul style="list-style-type: none"> • Checked Labelling <input type="checkbox"/> • Received PSSC (Clearance Procedure)..... <input type="checkbox"/> • Performed HV and LV Phase Outs <input type="checkbox"/> • Performed Phase Rotation & Voltage Testing..... <input type="checkbox"/> 			

3. PROTECTION SYSTEMS, FUNCTIONS & FAULT LOCATION

<p>Fault Location and Analysis:</p> <ul style="list-style-type: none"> • Involvement in fault activity and restoration <input type="checkbox"/> • Use of diagrams <input type="checkbox"/> • Direction from Control Centre <input type="checkbox"/> • Fault Indicators <input type="checkbox"/> • Other Operating Personnel <input type="checkbox"/> • Co-ordination and communication with Emergency Services <input type="checkbox"/> 			
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4. DISTRIBUTION SYSTEM EQUIPMENT

<p>Identify these types of Distribution Substations:</p> <ul style="list-style-type: none"> • Indoor substation <input type="checkbox"/> • Kiosk substation..... <input type="checkbox"/> • Underground Substation..... <input type="checkbox"/> <p>Transformers:</p> <ul style="list-style-type: none"> • Transformer cooling and alarms <input type="checkbox"/> • Ratings..... <input type="checkbox"/> 			
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5. SWITCHING & OPERATING

<p>Demonstrated how to identify the correct switching device to be operated using: Switch number, switch type, geographical location, electrical location and cable destinations. <input type="checkbox"/></p>			
<p>HV Fuses: Understands characteristics and types of metal clad fuses. <input type="checkbox"/></p>			
<p>Transformers HV & LV: Has isolated, earthed, commissioned & tested the following transformers:</p> <ul style="list-style-type: none"> • Indoor Distribution..... <input type="checkbox"/> • Kiosk / padmount..... <input type="checkbox"/> 			

TRAINING	MENTOR NAME	SIGN	DATE
5. SWITCHING & OPERATING CONTINUED			
Fault Indicators Has an understanding of the operation reading and re-setting (if applicable).			
HV Customer Networks Has operated or is able to demonstrate an understanding: <input type="checkbox"/>			
6. SWITCHING/OPERATING SPECIFIC EQUIPMENT			
HV Switchgear Has <u>operated</u> a minimum of 5 HV Switching pieces of equipment and has an understanding of a further 5. Please list			
Has operated:			
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•			
•			
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•			
•			
Has an understanding of:			
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•			
•			
•			
•			
•			
WHERE INSTALLED: Has operated or is able to demonstrate an understanding of: • Merlin Gerin RM6-Talus DNP3 Remote Control <input type="checkbox"/>			
Speciality Substations and Equipment Has attended and discussed Substations and/or Auto Change Over Equipment..... <input type="checkbox"/>			

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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.

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 DS

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	Name	Signed	Date
Mentor/s			

Supervisor			
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Manager			
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