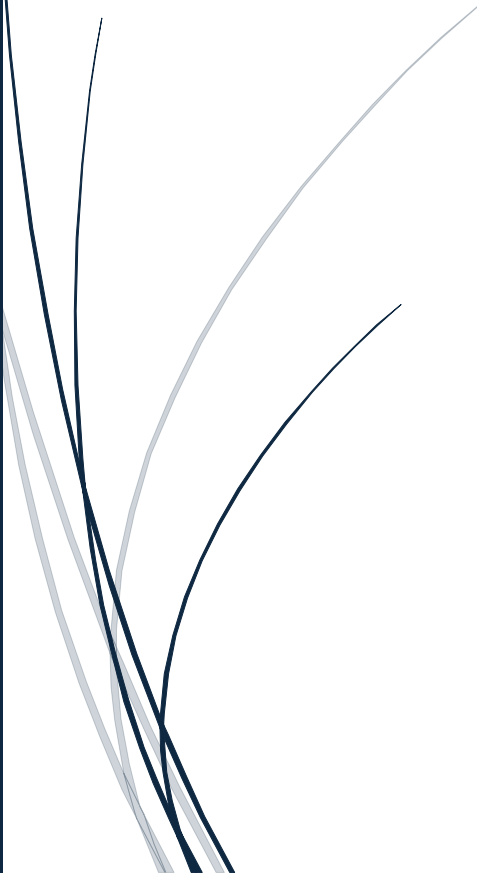




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WESR High-Voltage Operating Rules



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WESR High-Voltage Operating Rules

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Applies to: High-Voltage (HV) activities within the WESR-controlled boundary

HV definition (for this document): > 1 kV AC or > 1.5 kV DC (site-specific stricter definitions prevail)

Purpose. This document sets mandatory rules for planning, operating, isolating, testing, and restoring HV systems under WESR. It aligns with EN 50110-1:2023 operating principles and our WESR add-ons (LV Addendum, COHE, EIR, Lockout Instruction Process). Where this document is more stringent than baseline WESR, this document prevails. Stricter law/site rules override both.

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1. Scope & Hierarchy

- **Scope:** All HV operating and work activities: switching, racking, isolation, earthing, functional checks, testing/commissioning, maintenance and fault response on HV equipment (switchgear, transformers, cables/overheads, HV auxiliaries).
- **Hierarchy:**
 - 1) Applicable law & site rules (most stringent).
 - 2) **WESR-HV-OPS** (this document).
 - 3) WESR add-ons (LV Addendum, COHE, EIR, Lockout Instruction Process) as referenced herein.
 - 4) Local procedures and manufacturer instructions.
- **Interface with LV:** The **WESR LV Addendum** governs ≤ 1 kV AC/ ≤ 1.5 kV DC. HV/LV boundary is defined per installation (see Section 12).
- **Single point of control:** The **PCEI** retains control of the installation whenever it is not in normal service.

2. Roles & Responsibilities (HV)

- **PREI** — Owns HV governance, appoints **PCEI**, approves high-risk deviations and competence frameworks.
- **PCEI (Person in Control of the Electrical Installation)** — Overall control of HV installation; plans/verifies switching & primary safety measures; issues and controls Safety Documents until restoration.
- **D-PCEI (Delegate)** — Written delegation of HV control tasks for defined plant/period.
- **PCWA (Person in Charge of Work Activity)** — Controls the work; conducts **RISK-W** at the workplace; sets supplementary measures; briefs team; clears the Safety Document.
- **Switching Assistant (HV-SA)** — Competent person assisting PCEI/D-PCEI during HV switching/earthing; reads back orders and records confirmations.



- **Skilled/Instructed/Ordinary Persons** — As per EN person categories; mapped to WESR competence (Section 11).
- **Test Lead (HV-TL)** — For sanctioned testing; leads technical execution under **SfT/TEP**, coordinates with PCEI.

Independence rules:

- HV switching/earthing requires **order/confirmation** and **two-person** control (PCEI + HV-SA or equivalent).
- The **PCWA** is independent from PCEI in exercising work control; conflicts resolved in favour of safety.

3. Safety Documents & Control

- **PTW-HV (Permit-to-Work, HV)** — Default for Dead/Vicinity work on HV plant. Issued by PCEI/D-PCEI to PCWA after isolation/earthing/verification are confirmed.
- **SfT (Sanction for Test)** — Required where testing/commissioning demands varied primary precautions or temporary energisation; exclusivity applies (no parallel permits on same equipment).
- **Access Agreement (AA-HV)** — For non-electrical work in HV areas with residual electrical risk (e.g., near barriers/earthing).
- **Switching Schedule (SS-HV)** — Authorised, stepwise plan for switching, isolation, earthing and restoration with four-eyes review.

All Safety Documents bear unique IDs, issue/version, time stamps, signatures and explicit boundaries.

4. Operating Principles & Distances

- **Dead working is the default.** Apply the Five Safety Rules:
 - 1) Disconnect completely.
 - 2) Secure against reconnection.
 - 3) Verify absence of operating voltage (**test-measure-test** where applicable).



- 4) Apply **earthing and short-circuiting** at all required points.
 - 5) Protect against adjacent live parts (screens/barriers/safe distances).
- **Approach distances (indicative, site-specific):**
 - **Live working zone:** access prohibited.
 - **Vicinity zone:** maintain site-specified minimum approach distance (MAD) or erect barriers; PCWA documents the control in PTW-HV.
 - **Barriers/screens** must be fit for voltage level and environment; temporary earthing locations defined in SS-HV.

5. Switching & Isolation (HV)

- **Plan:** Prepare **SS-HV**; identify all sources/feeds, induced/transfer potentials, auto-reclose, intertrips, backfeeds (e.g., station service/aux).
- **Execute:** Two-person protocol (PCEI + HV-SA). Use order/confirmation with read-back; record time and position indications.
- **Visible isolation:** Use withdrawable positions/visible breaks or reliable position indication per design; confirm in SS-HV.
- **Earthing & short-circuiting:** Apply per SS-HV at designated points using approved devices; record device IDs and locations.
- **Zero-voltage verification:** Suitable approved instruments and methods for HV; test at appropriate points relative to isolations and earths.

Change control mid-switching: Halt at any unexpected indication; hold point; notify PCEI; do not proceed until resolved.

6. Working Procedures (HV)

- **Dead working (default):** Isolation + earthing + verification complete; PTW-HV issued; PCWA briefing and boundary marking done.



- **Working in the vicinity of live parts:** Barriers or MAD enforced; dedicated supervision if required; documented on PTW-HV.
- **Live work (exceptional):** Only if justified, risk assessed and authorised at the appointed level; compliant equipment, techniques and PPE; governed by **SfT/TEP** with explicit presence and exclusivity.

7. Testing & Commissioning (SfT/TEP)

- **Sanction for Test (SfT):** Required when varying primary precautions or energising for tests.
- **Test & Energisation Plan (TEP-HV):** Defines test scope, points, observers, temporary devices, communications, stop criteria, and post-test state.
- **Presence & exclusivity:** PCEI/D-PCEI present as defined; no parallel PTW/AAs on the same plant during SfT.

8. Status Model & Transitions

Normal Operation → Isolated → Proved Dead → Earthed/Short-Circuited → Work in Progress → Suspended (Made Safe) → Under Test (Controlled) → Ready for Energisation → Restored / Normal Operation.

- **Suspend/Resume:** On pause, maintain earthing/locks as applicable; re-start requires re-confirmation and team re-brief.
- **Ready for Energisation:** PCWA clears; PCEI confirms prerequisites and restores per SS-HV.

9. Tools, PPE & Portable Earthing

- **PPE:** Arc-rated clothing and face/hand protection where arc hazard exists; voltage-specific gloves/tools; dielectric footwear/mats as needed.
- **Tools & instruments:** Approved for HV measurements and operations; calibration in date; **self-test before/after** for voltage presence indicators.



- **Portable earthing:** Devices rated for system fault levels; applied/removed as per SS-HV using insulated operating sticks where needed; entries recorded in **Earthing Log (EBL-HV)**.

10. Communications & Order/Confirmation

- **Single channel** during critical steps; keep clear of general chatter.
- **Protocol:** Giver states command → receiver reads back verbatim → giver confirms.
- **Records:** Note start/end of switching, key positions, hold points, and confirmations on SS-HV/Log.

11. Competence, Authorisation & Supervision

- **Person categories:** Skilled, Instructed, Ordinary — applied to HV context.
- **Role authorisations:** PCEI/D-PCEI for defined installations; HV-SA competent/assessed; PCWA competent for workface control.
- **Training:** Initial + periodic refreshers; event-driven re-authorisation after incidents, long absence, equipment upgrades or rule changes.
- **Supervision:** Set by PCWA based on task risk and team competence; higher oversight for vicinity or Sft.

12. Records, Versioning & Governance

- **Records:** PTW-HV, Sft/TEP-HV, SS-HV, EBL-HV, RISK-W, audit logs, calibration certificates and incident/EIR reports retained per records matrix.
- **Versioning:** Semantic versioning (vX.Y.Z); change log and effective date; only the controlled copy is valid.
- **Audits & KPIs:** Permit quality, four-eyes rate, switching deviations, near-miss reporting, calibration compliance, Sft exclusivity adherence.



Annexes (Templates & Aids)

Annex A — SS-HV (Switching Schedule, HV)

Content: device IDs; actions/positions; expected indications; earthing locations; verification points; interlocks; hold points; order/confirmation log snippet; completion & deviations.

Annex B — PTW-HV (Permit-to-Work, HV)

Content: boundaries; isolation/earthing references; RISK-W; adjacent live parts control; PPE/tools; PCWA briefing; suspension; clearance & restoration.

Annex C — SfT (Sanction for Test)

Content: test scope; presence & exclusivity; TEP-HV ID; observers; temporary devices; stop criteria; post-test state.

Annex D — EBL-HV (Earthing Log)

Content: earthing device ID/rating; application/removal times; location; continuity/fit checks; authoriser.

Annex E — RISK-W (On-Site Risk Review)

Content: location hazards; MAD/barriers; concurrent work; comms; briefing time/sign.

Annex F — Audit Checklist (HV Operations)

Key points: four-eyes approvals, order/confirmation records, earthing placements, zero-voltage verification evidence, SfT exclusivity, restoration sequence.

Annex G — Incident Links (EIR/ESI)

Pointers to EIR-Form-001, Evidence Register, Photo Log, Chain-of-Custody, Shock Quick-Ref, Medical Handover.

Annex H — Version History (Template)

Version	Date	Description of Changes
v1.0.0	TBD	Initial issue (WESR HV Standalone)