

BATTERY FAILURE



FLEET OPERATIONS PROTOCOL



Trigger Points

- Smoke or sparks from battery compartment.
- Dashboard warning for battery fault or thermal runaway.
- Sudden power loss or inability to accelerate.



Responsibility

Depot Manager

Depot Control Room

Depot Supervisors

Driver

A. BATTERY MONITORING



Monitor via BMS & Telematics:



Responsibility:

Driver



Driver to Monitor following alerts:

- Low SOC (< 20%)
- High battery temp (as prescribed by OEM) (> 40°C)
- Battery fault warning
- Charging error
- Voltage drop
- Thermal runaway warning
- Emergency stop triggered
- High Motor temp
- Battery Control System (BCS) warning
- Traction Control System (TCS) warning
- Air Compressor Warning



Responsibility:

Depot Control Room



Control Room to monitor following Alerts :

- SOC threshold breach
- Temperature spike
- Voltage imbalance
- Charging failure
- Insulation fault
- BMS communication loss
- Battery health degradation

B. IMMEDIATE SAFETY ACTIONS



Responsibility:

Driver



Secure Vehicle on risk identification

- Park safely, isolate high-voltage system, and Evacuate onboard passengers.
- Report to control room and Depot Manager.



Responsibility:

Depot Manager



Dispatch Support

Send recovery or emergency response if thermal risk is present.

C. FLEET COORDINATION



Responsibility:

Depot Manager



Deploy Replacement Bus: Ensure service continuity.



Reroute Services: Adjust schedules and notify passengers.



Notify Depot: Coordinate diagnostics and inspection.

D. EMERGENCY ACTIONS - SOPS



Responsibility:

Depot Control Room

Fleet Operation SOPs for Control Room

- Maintain communication with driver and emergency responders.
- Share safe parking zones and hazard alerts with other buses.
- Log incident details for post-event analysis.



Responsibility:

Driver

SOPs for Driver

During battery failure

- Stop bus immediately and inform passengers about the situation and next steps.
- Ensure all passengers exit calmly and move to a safe zone.
- Attempt fire suppression only if safe.
- Report location and hazard status to Control Room.
- Follow towing or evacuation instructions.

If battery risk escalates

- Evacuate passengers immediately if smoke or heat is detected
- Use onboard fire suppression system if safe.
- Call emergency services for fire or hazardous conditions
- Do not restart or move the vehicle until cleared
- Avoid contact with high-voltage components

BATTERY FAILURE



DEPOT OPERATIONS PROTOCOL



Trigger Points

- Smoke or unusual odor from battery
- Abnormal voltage/current on BMS
- Audible alarms from charger or battery
- Sudden shutdown or overheating of battery



Responsibility

Depot Manager

Electrical Safety Lead

Charging Operators

Maintenance Team

Safety Officer

A. BATTERY MONITORING



Monitor via BMS & SCADA:



Responsibility:

Depot Control Room

Maintenance In-charge

Trigger Alerts to Watch For:

- 🔥 Smoke or odor from battery packs
- ⚡ Abnormal voltage/current readings
- 🔊 Audible alarms from chargers or battery systems
- 🔴 Sudden shutdown or overheating during charging
- 📉 SOC drop or voltage imbalance
- 📶 BMS communication loss

B. SAFETY PROTOCOLS



Responsibility:

Depot Manager

Electrical Safety Lead

🔌 **Isolate Faulty Battery System:** Disconnect affected battery packs or EVSE units from power.

🔊 **Activate Emergency Response:** Alert fire safety team and evacuate nearby personnel if thermal risk is present.

🔌 **Suspend Charging Operations:** Stop all charging in affected zones until inspection is complete.

C. Maintenance & Escalation



Responsibility:

Depot Manager

Electrical Safety Lead

🔧 **Inspect Battery & EVSE Units:** Perform diagnostics, thermal scans, and insulation resistance tests.

📞 **Notify OEM or Technical Support:** Escalate issue if fault is beyond depot-level resolution.

🚫 **Quarantine Faulty Equipment:** Tag and isolate damaged components for further analysis.

D. EMERGENCY ACTIONS - SOPS



Responsibility:

Charging Operator

Maintenance In charge

Emergency Isolation SOP for Faulty Battery/EVSE- During Maintenance:

- Immediately stop all power to the battery system/ EVSE via SCADA or manual disconnect.
- Isolate the affected EVSE or battery from power supply.
- Apply Lockout/Tagout (LOTO) on breakers and connectors.
- Restrict access to the affected area (maintenance/ charging area) and alert nearby staff.
- If smoke or heat is detected, activate fire suppression and evacuate.
- Notify depot manager and emergency services if escalation occurs.
- Log the incident and submit report for SOP compliance.



Responsibility:

Electrical Safety Lead

Maintenance In charge

Emergency Isolation SOP for Bus with Faulty Battery in Depot:

- Do not power on or connect the bus to a charger.
- Evacuate personnel within immediate vicinity of the affected bus.
- Isolate the bus using cones or barriers.
- Wear appropriate PPE (gloves, face shield, fire-resistant gear). Apply lockout/tagout to battery disconnects and auxiliary systems.
- Inspect for swelling, smoke, leaks, or unusual heat.
- Keep fire suppression tools (Class D extinguisher/ sand/ water etc.) nearby.
- Ventilate area if gases are suspected.
- Notify OEM and fire services if thermal risk is high.
- Move bus to quarantine zone once safe.
- Log incident and conduct safety review.