

Electric Vehicle Supply Equipment and Electric Vehicle Energy Management System: Appendix A – Variance

Date of Issue: June 20th, 2023

NO: IB-EL 2023-05

Topic: Variance for electric vehicle supply equipment utilizing electric vehicle energy management systems.

The following items must be considered for the purpose of a variance application requesting relaxations to load calculations for feeders and services or a relaxation of approved equipment requirements in rule 2-024:

Installation Permits:

- In order to ensure that the permit scope includes all EVSE and EVEMS equipment, plans and specifications including load calculations in accordance with the BC Electrical Code from the Registered Professional of Record must be included with all permit applications.
- For the purpose of installing an EVEMS certified to other product standards in a single dwelling, a load calculation is required to be submitted by a qualified person as part of permit submission. The qualified person will be responsible for the verification and testing of the EVEMS for correct operation and that the EVEMS will establish a fail-safe state to ensure that the actual loads are in compliance with BC Electrical Code.
- All loads being managed by the EVEMS shall be identified and included in load calculations.
- The connected load shall be determined by the nameplate markings on the equipment.
- EVSE with variable load settings shall have the maximum setting permanently marked on the equipment.
- A copy of the accepted variance, associated documentation, plans and specifications, and manufacturer's instructions, must be provided to the equipment owner prior to allowing the equipment to be placed into operation, and prior to final inspection.
- Compliance with the Safety Standards Act shall be verified in writing by a Field Safety Representative, for all EVSE and EVEMS, prior to final inspection and before allowing the equipment to be operated by an owner.

Operating Permits

- Operation of EVSE and EVEMS equipment may require an electrical operating permit, in accordance with terms and conditions of a variance.

For EVSE and EVEMS equipment that is installed where an electrical operating permit has already been issued for the facility:

- EVSE and EVEMS equipment may be installed under the operating permit, in accordance with Directive: Electrical operating permit requirements, D-E3 070801 7 Revision 1.
- All EVSE and EVEMS, plans and specifications including load calculations in accordance with the BC Electrical Code must be identified in the electrical operating permit log.
- A copy of the variance must be recorded in the electrical operating permit log; and
- All alterations and modifications to the EVSE or EVEMS equipment, including changes to operation of the equipment must be recorded in the electrical operating permit log.

For EVSE and EVEMS equipment that is installed at a facility prior to issuance of an electrical operating permit (where required):

- A copy of the variance must be included as part of the electrical operating permit application.
- All EVSE and EVEMS, plans and specifications including load calculations in accordance with the BC Electrical Code must be identified in the electrical operating permit log.
- A copy of the variance must be recorded in the electrical operating permit log; and
- All alterations and modifications to the EVSE or EVEMS equipment, including changes to operation of the equipment must be recorded in the electrical operating permit log.

Information regarding operating permits can be found at

<https://www.technicalsaftycbc.ca/electrical/electrical-operating-permits>

Variance Application Process: A variance is required in order to apply the relaxations to load calculations for feeders and services or a relaxation of approved equipment identified in rule 2-024.

General requirements:

- The variance application must:
 - identify the rules to be varied under the BC Electrical Code;
 - provide rationale in support of the variance request;
 - provide a clear description of the system design and operation; and
 - demonstrate that the EVEMS, by means of control and management of loads, meets the fundamental principles of protection for safety mandated by the BC Electrical Code and will not cause the loading of distribution equipment, feeders, or services to exceed the requirements of rules 8-104 3), 5) and 6).
Demonstrated verification of this by the registered professional will be required.
- Incomplete applications for a variance will not be accepted.
- The variance application shall clearly indicate when an administrator is required to operate the regulated product.
- Where the completed installation involves an administrator, the variance application shall also include a detailed plan demonstrating:
 - how loads will be managed; and
 - how changes to the connected load (such as the addition, alteration, or removal) are documented.
 - The administrator plan is to be made part of the terms and conditions on the variance.
 - Any changes in administration will be documented in the operating permit log.
- Documents must be submitted before final inspection as a record that the commissioning and testing have been completed.

Documentation and Conditions required for Variance: Documentation and the confirmation of conditions are required for each variance. Additional conditions may be set by the authority having jurisdiction, when issuing a variance.

Documentation:

- A copy of the certification record for the EVSE from the certification body.
- A copy of the SPE-1000 Inspection report for the EVEMS is attached to this application.
- For third party EVEMS, documentation on the suitability of the system with the EVSE.
- Documentation showing the utility has been made aware of this installation.
- **Rule 2-014, Rule 8-106:** Plans and specifications of the equipment and the electrical system including load calculations, and managed loads.

Conditions:

The asset holder (equipment owner) will appoint an administrator or an authorized agent of the administrator to be responsible for operating the electric vehicle energy management system if required by EVEMS.

In the event of a breakdown or malfunction of the EVEMS, EVSE communications or electric vehicle response, the EVEMS or EVSE will disconnect power to the electric vehicle (EV) or enter a safe-state condition.

Any loss of communications between the EVEMS, EVSE, or EV will result in the disconnection of power to the electric vehicle (EV) or the system entering a safe-state condition.

When it is evident that automatic restarting or continued lack of communications is liable to create a hazard, the system shall remain in a safe-state or de-energized condition. Once safe operating conditions are restored, a safe start-up of the EVSE will be ensured.

The failsafe processes installed in the energy management system will remain in effect for the life of this equipment and will not be altered in any way.

Original documentation including installation and maintenance instructions, plans and specifications, commissioning reports and other documentation associated with this variance, the EVEMS, and the EVSE shall be provided by the installer to the equipment owner.

The installer will provide clear instructions to the owner and will include a description of records that must be maintained by owner.

Safety attributes of the system will be verified and documented in the commissioning report. The report will be provided with the inspection request to connect the system for installation permits or in the case of an operating permit by declaration into the log book.

The product(s) included under this variance will be maintained in a safe manner and all maintenance records will be kept by the owner.

The EVEMS will not permit the load of any regulated equipment to exceed the rating marked on the equipment.

The EVEMS will be continuously operational when charging is occurring.

The EVEMS will not adversely affect operation of life safety systems, essential electrical systems, and emergency electrical power supply systems as defined or referenced in the BC Electrical Code.

An EVEMS that has the ability to manage and control an electric vehicle used as an electric production source will not provide power to loads in excess of the output rating of the production source equipment.

The permit holder, equipment owner, administrator, and operators will be provided with the necessary training to operate the system in a safe manner. Confirmation of this training will be documented and be made available to the authority having jurisdiction, upon request.

The permit holder will be responsible to maintain a management plan that controls the loads on the electrical system, including the demand loads on the system.

The operating permit holder will document in the log book the addition, alteration, or removal of equipment.

The utility will be consulted and notified of all EVEMS installations where the service may be overloaded upon the failure or removal of the EVEMS.

The variance applicant will ensure that the asset holder and installer are promptly given a copy of this application and the variance.

Where an administrator for an EVEMS system has been identified, an operating permit will be required for the EVEMS as a condition of the variance even if an operating permit is not otherwise required by the Safety Standards Act and its regulations.

Provincial Safety Manager

References:

Safety Standards Act, SBC 2003, c. 39

Electrical Safety Regulation, B.C. Reg.

50/2017 **Safety Standards Act:**

Variance — a document without precedential value issued, for an individual circumstance on a single occasion, by a safety officer or safety manager allowing:

- (a) a deviation from the application of a regulation under this *Act*; or
- (b) a use, other than the standard use, of a regulated product if the proposed use is not specifically prohibited under this *Act*.

Variations

32 (1) A safety officer may, if requested by any person, issue, in writing, a variance to the person varying the application of a provision of the regulations with respect to a regulated product or regulated work.

- (2) A variance may
 - (a) be made subject to terms and conditions specified by the safety officer; and
 - (b) continue for a specified period of time.
- (3) If the person who holds a variance complies with the terms and conditions of the variance, the person must be considered to be in compliance with the regulation that it varies.
- (4) If a person applies for a variance and a safety officer refuses to issue it, or issues it with terms or conditions attached to it that are not requested or agreed to by the applicant, the safety officer who deals with the application must inform the applicant and, if the applicant requests written notice, give the applicant written notice of that decision.
- (5) A written notice under subsection (4) must state the reasons for the decision and that the applicant has the right to make a written request for a review by a safety manager.
- (6) A decision of a safety manager on a review of a decision under subsection (4) is not appealable to the appeal board.