

Health and Safety Standard

PORTABLE GROUND SET AND PORTABLE BOND MAT

1 PURPOSE

This standard supports the Hazard/Aspect Controls Policy and establishes the electrical and mechanical requirements of portable ground assemblies and portable bond mats as well as the requirements for assembly, maintenance and testing of portable ground sets (assemblies) and portable bond mats.

2 SCOPE

This standard applies to portable ground sets and portable bond mats used to create equipotential zones on electrical apparatus at SaskPower. It does not apply to fixed grounding devices or platforms found on SaskPower facilities.

This standard outlines the minimum requirements that shall be met or exceeded by SaskPower employees and contractors. Failure to comply may result in injuries, damage to equipment and property, performance management or any combination thereof.

The use of the word “shall” within this standard denotes a mandatory action, whereas the use of the word “should” or “may” denotes a recommended action.

3 DEFINITIONS

The following definitions apply to this standard:

De-energized - The state that exists when electrical apparatus is isolated from all sources of dynamic energy and grounded.

Dynamic Energy - The energy available when electrical, mechanical, or nuclear apparatus is connected to a substantial source of energy.

Electrically Safe Zone - The zone of the specified apparatus which is isolated or de-energized and all charged energy hazards have been controlled with the use of approved Bonding and Grounding Procedures.

Grounded - Intentionally connected to earth through a conducting connection of sufficiently low impedance and having sufficient current carrying capacity to prevent a build-up of voltages that may result in undue hazards to personnel and/or connected equipment.

4 REQUIREMENTS

4.1 HAZARD IDENTIFICATION AND USE

The purpose of portable ground sets is to ensure that the apparatus to be worked-on is de-energized and maintains an equipotential zone for workers performing construction and maintenance activities on SaskPower apparatus. De-energization is a requirement for an Electrically Safe Zone.

The purpose of portable bond mats is to create an equipotential zone for workers on the ground should the apparatus they are working on become inadvertently energized (alive).

The Hazard/Aspect and Risk Assessment process supported by directives, procedures, guidelines, training, and apparatus specific procedures shall be used to determine:

- The type and size of portable grounds and portable bond mats.
- The location(s) and connections of portable grounds and portable bond mats. More than one portable ground set or portable bond mat may be required to establish an Electrically Safe Zone.

Any portable ground set or portable bonding mat that has been subjected to a fault shall be removed from service. Due to potential damage to the stranding it could fail in service if reused.

4.2 PORTABLE GROUND ASSEMBLIES

Portable ground assemblies shall be in compliance with the following standards:

- CAN/ULC 61230, Live Working- Portable Equipment for Grounding (Earthing) and Bonding or
- ASTM F 855, Standard Specifications for Temporary Protective Grounds To Be Used on De-energized Electric Power Lines and Equipment

Portable ground assemblies shall be inspected, tested, and maintained in compliance with the following standard:

- ASTM F 2249 Standard Specification for In-service Test Methods for Temporary Grounding Jumper Assemblies Used on De-energized Electric Power Lines and Equipment

4.3 PORTABLE BOND MATS

Portable bond mats shall be in compliance with the following standards:

- ASTM F2715, Standard Specification for Temporary Protective Equipotential Bond Mat to be Used on De-Energized Equipment

4.4 PRE-USE INSPECTION

Portable ground sets and portable bond mats shall be inspected for defects or damage prior to each use per appropriate SOP.

- Portable Ground sets used within power generation plants shall be inspected as per 'A000-BG-SOP-001 Pre-Use Inspection of Temporary Protective Grounds'
- Ground sets used on the Transmission or Distribution system shall be inspected per the 'In-Service Inspection and Testing of Temporary Bonds and Grounds' SOP.
- Portable Bond Mats shall be inspected per the 'In-Service Inspection and Testing of Portable Bond Mats' SOP.

4.5 PERIODIC TESTING

Portable Ground sets shall have periodic testing performed as per ASTM F2249 and the appropriate SOP:

- Portable Ground sets used within power generation plants shall be tested per 'A000-BG-SOP-002 In Service Inspection and Testing of TPG Assemblies'
- Ground sets used on the Transmission or Distribution system shall be tested per the 'In-Service Inspection and Testing of Temporary Bonds and Grounds' SOP.

Portable Bond Mats shall have periodic testing as per ASTM F2715 and the 'In-Service Inspection and Testing of Portable Bond Mats' SOP.

When protective Grounding and Bonding equipment is tested, it shall have a Test Due Date indicated on the tag that is a maximum of 2 years after the date of the test.

No portable ground set or portable bond mat shall be used that is untested or beyond the Test Due date.

5 IMPLEMENTATION

The requirements of this version of the standard are to be met within six months of the approval date at which time the previous version will be superseded.

6 RESOURCES

6.1 INTERNAL RESOURCES

Related Policies:	Hazard/Aspect and Risk Assessment Policy
References:	Standard Protection Code Power Production, Plant Grounding and Bonding Manual Transmission and Distribution Grounding and Bonding Training Modules In-Service Inspection and Testing of Temporary Bonds and Grounds SOP In-Service Inspection and Testing of Portable Bond Mats SOP A000-BG-SOP-001 Pre-Use Inspection of Temporary Protective Grounds A000-BG-SOP-002-R2.1 In Service Inspection and Testing of TPG Assemblies
Related Standards:	Hazard/Aspect and Risk Assessment Standard

6.2 EXTERNAL RESOURCES

Related Legislation:	<i>The Occupational Health and Safety Regulations, 2020</i>
Related Standards:	CAN/ULC-S801-14 Standard On Electric Utility Workplace Electrical Safety for Generation, Transmission and Distribution IEEE 1048 IEEE Guide for Protective Grounding of Power Lines IEEE 1246 IEEE Guide for Temporary Protective Grounding Systems Used in Substations

	<p>ASTM F855 Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment</p> <p>CAN/ULC 61230 Live Working – Portable Equipment for Grounding and Bonding</p> <p>ASTM F2249 Standard Specification for In-Service Test Methods for Temporary Grounding Jumper Assemblies Used on De-Energized Electric Power Lines and Equipment</p> <p>ASTM F2715 Standard Specification for Temporary Protective Equipotential Bond Mat To Be Used on De-Energized Equipment</p>
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Ownership

Division:	Human Resources and Safety
Department:	Health and Safety
Review Frequency:	3 years
Approved by:	Health & Safety Council
Approval Date:	June 9, 2021

Document History

Revised by	Revision Purpose	Date
R. Mack	Scheduled Review Cycle	June 9, 2021
M. Ereth	Scheduled Review Cycle	May 30, 2018
Health and Safety	Scheduled Review Cycle	May 25, 2016