TransGard™

SUBSTATION FENCING

Patented protection against animal outages

MAINTENANCE AND SERVICE GUIDE

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OVERVIEW

This manual provides an overview of basic maintenance and troubleshooting recommendations related to your TransGard substation fencing. For additional information, consult the TransGard Installation Manual or view the TransGard Installation Video.

For specific questions not covered or resolved in this manual, refer to your TransGard technical support contact, or call **(717) 227-2600**.

NOTE: Unless otherwise noted, turn the TransGard fence off at the main **Control Panel** switch before performing maintenance functions.

ROUTINE SYSTEM MAINTENANCE

TransGard fencing has been engineered for long-lasting prevention of animal incursions. TransGard recommends substation operators perform the following basic maintenance steps annually to ensure optimal operation of the fencing.

- **Walk the fence perimeter**

Make a visual inspection of the fence, looking for gaps between or under panels. Listen for "snapping" sounds that may indicate an electrical fault. Ensure each long post is covered by an insulator sleeve.

- **Check connections**

Power off the TransGard fence. Check all jumper wire connections between panels. Tighten the connections as needed, following guidelines in the **TransGard Installation Manual**.

Walk the perimeter of the fence and listen for any snapping noises

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- **Check the voltage**

Whenever visiting the substation, check the **Control Panel** to ensure the system is on and that the fence is energized. When the fence is operating properly, the **Alert Strobe** will appear green and the **Digital Voltmeter** should read around 10 Kv. *(See "Troubleshooting" section for details on handling problems with low voltage.)*

- **Confirm proper panel reinstallation**

If any fence panels have been removed for maintenance or access to the substation, make sure they have been reinstalled correctly, including snake guards on any snake panels. Check to ensure there are minimal gaps between panels. Backfill any gaps under panels and completely cover stands with substation stone.

- **Prevent insect nesting**

Check all post tops for black rubber stopping caps. These caps serve as a barrier to bees, hornets and other flying insects that may see the posts as potential nest sites. Replace any caps that are missing or deteriorated. Replacement caps are available from TransGard.

A. Alert strobe B. Digital volt meter C. On/off switch

Managing the substation environment

TransGard fencing offers consistent long-term protection. However, changes *around* a substation's footprint can compromise system effectiveness: plants grow, wildlife populations change, and the topography surrounding a site can erode. Take the following steps at least once per year to ensure the substation environment will not adversely affect reliability.

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- **Clear debris**

Check the entire fence perimeter to make sure no debris has fallen or been blown against the fence. Debris can drain the energizer, reducing the effectiveness of the system as well as the lifespan of the fence energizer. De-energize the fence as a safety precaution before removing debris.

- **Cover fence base**

Check that the bottom PVC fence rail and the base of the stands are completely covered with gravel inside and outside of the entire fence perimeter. If necessary, add gravel to close gaps that could provide entry to climbing animals and snakes.

Rake gravel on inside and outside of bottom rail of connecting panels

- **Foliage review and removal**

Check for any overhanging branches or brush growth around the substation that may provide a nimble climbing animal access. Remove all vegetation growing inside the substation. Cut back tree branches that hang over the perimeter fence. If necessary, schedule trimming or removal.

- **Installation of supplemental equipment**

TransGard recommends the installation and maintenance of line guards (spinners) on all power lines leading out of the fenced in area. Install spinners in a way that drops climbing/falling animals well outside the perimeter of the fence system. If spinners are secured with plastic zip-ties only, replace the ties with line clamps to keep the spinners from sliding toward the fence line. In addition, consider pole wraps that prevent climbing animals from using nearby wooden poles for substation access.

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MAINTENANCE ACCESS

TransGard's modular design allows you to temporarily remove — or swing open — a section of the fence for substation maintenance or other work. You can also add panels to change the configuration of the fence perimeter. Follow these steps for removal and reconnection of a fence panel:

- To remove an entire section of fence, remove the jumper wires and snake guards (if snake panels are being used), and lift the panel off the stands.

- To swing open a section of fence, remove the jumper wires, lift the end of the panel that is on the short post of the stand up about 6" and rotate the fence open like a gate.

- To change the fence configuration, remove panels as described above and add new panels based on the instructions in the TransGard **Installation Manual**.

- When reconnecting panels, be sure to follow instructions in the **Installation Guide** on proper panel installation and connection of jumper wires.

Lift the fence open like a gate.

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TROUBLESHOOTING

During proper system operation, the DC voltage is output from the **Control Center** to the fence panel directly to the left of the **Primary Entryway**. The voltage travels through all fence panels and returns to the **Control Center** from the fence panel directly under the **Control Center**. In the unlikely event that the **Digital Voltmeter** on the **Control Panel** registers no voltage or low voltage (less than 5kV), consider the following:

"No Voltage" reading

- Check the voltage on the first panel to the left of the **Primary Entryway**. If no voltage registers there, the fault is in the **Control Center**.

- Check that all connections inside the **Control Center** are secure.

- Check that all **Insulator** sleeves are properly installed.

- Check the connections at all fence panels.

"Low voltage" reading

A low voltage reading may result from a faulty panel or connections. Take the following steps to identify the location of the problem.

- **Listen for indications of unsecured insulator sleeves.** Walk the perimeter of the fence and listen for "snapping" sounds. This indicates an electrical fault. There should be an insulator sleeve on the long post of each stand. If a short is isolated to a post, remove the rubber post cap using a flathead screwdriver to make sure the insulator sleeve is properly installed.

Ensure each long post is covered by an insulator sleeve.

Run jumper wire to adjacent panel

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- **Inspect jumper wire connections**

Power off the TransGard fence. Check all jumper wire connections and tighten the Phillips screws on the jumper wire connection blocks as needed. For systems newer than 2005, also check the "L-Connector" connection and tighten the set screws as needed using a 1/8" Allen wrench. These are the socket head set screws in the jumper wire connection blocks that attach the "L-Connectors" to the wire mesh. For more information, see the TransGard Installation Manual.

- **Test fence panels**

Using a handheld volt meter (fault finder) or other appropriate device, perform a test of the panels using the following steps:

- Check the voltage on the top section of wire mesh at the panels to the right and left of the main entryway. The two voltages should be at least 5kV and approximately equivalent to each other.

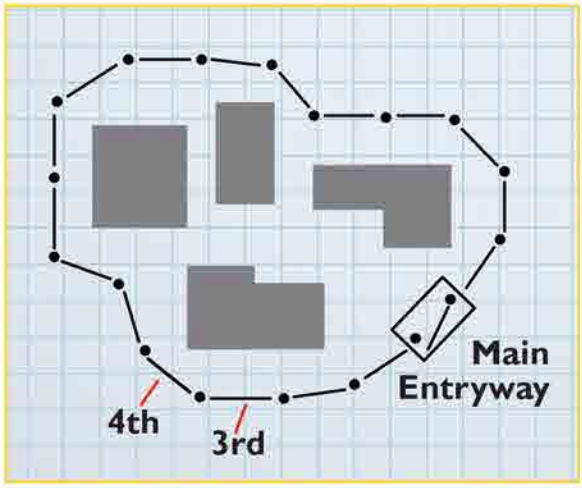
- Next, check the **fourth panel** to the left of the primary entryway.

- If that reading is low, move back to test the **third panel** to the left of the entryway.

- Continue this process, moving toward the entryway, until you determine the individual faulty panel.

- If the initial **fourth panel** registers a normal voltage reading, move to the next section of four panels and test "backward" toward the set of four panels you have already tested. Repeat this process until you locate the faulty panel.

- Inspect and secure or replace loose or worn connections between faulty panels.



After checking the panels to the right and left of the main entryway, check the 4th panel to the left of the main entryway and test each panel back toward the main entryway.

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• **Test the energizer.** If the fence output voltage is still less than 5kV and you have not identified any shorts or faulty panels, disconnect the fence leads from the energizer's positive and negative terminals and check the energizer output with a volt meter.

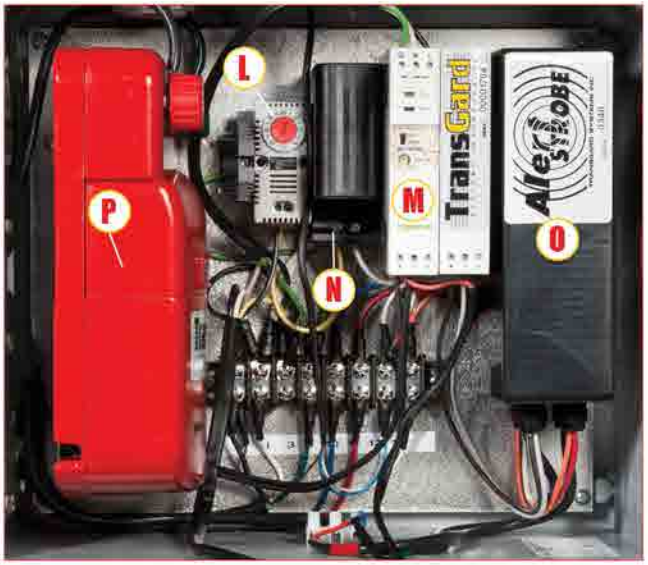
- If the leads are disconnected and the LED on the front of the fence energizer is flashing red, the energizer is faulty and must be replaced.

- If the LED on the front of the fence energizer is flashing green, the energizer is operating properly.

- If the fence energizer yields an output voltage of less than 5kV, it should be replaced. Expected energizer life is 3-5 years.

- The replacement energizer must be a low-impedance pulsing type, have at least two Joules of output energy, and a DC voltage output between 9kV (min) and 11kV (max).

- For optimal performance, install a TransGard replacement fence energizer, which has been specially engineered for TransGard substation fencing. To order a replacement energizer, contact TransGard.



L. Thermostat M. Power Supply N. Heater
O. Alert strobe module P. Energizer

FOR MORE INFORMATION

For a copy of the **TransGard Installation Manual** or the **TransGard Installation Video**, contact TransGard at (717) 227-2600 or email TransGard General Manager Bill Reichard at *breichard@transgardfence.com.*

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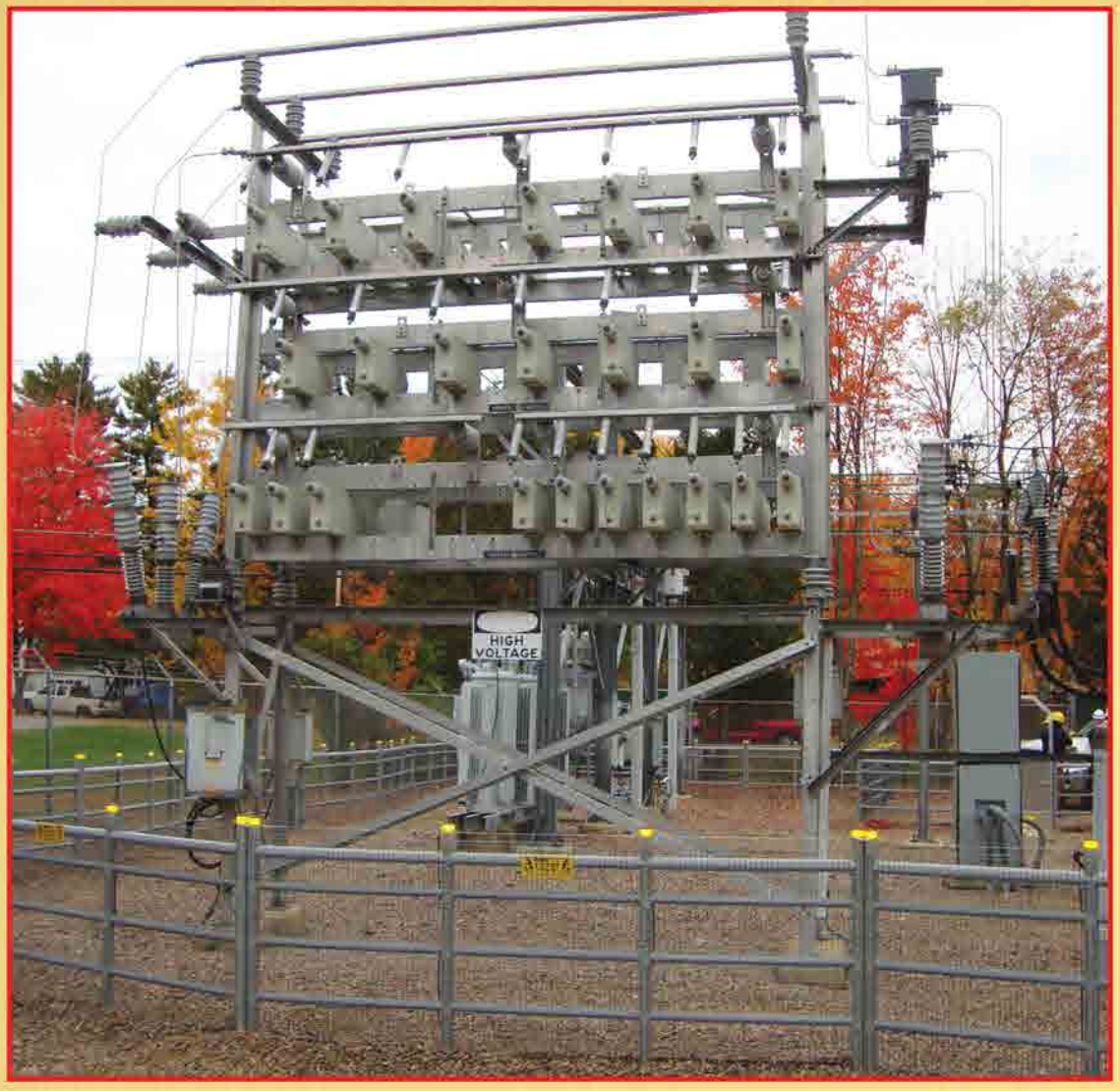
TransGard offers full installation of their fencing systems as well as installation training for utility employees. We've also created a convenient installation video available online by request. Contact us today to learn more.



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