

NEW BRUNSWICK ELECTRICAL

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# Electrical Safety

Warning signs, hazards, grounding, and safety  
issues

15 Expert Answers from Electric IQ

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## Top causes of electrical fires — how to prevent them?

**Electrical fires cause over 13,000 house fires annually in Canada, with most being completely preventable through proper maintenance and awareness.** Understanding the top causes and prevention strategies can save your home and family from tragedy.

**Overloaded circuits** are the leading cause of electrical fires in New Brunswick homes. This happens when you draw more electricity through a circuit than it's designed to handle. Signs include frequently tripping breakers, dimming lights when appliances start, or warm outlet covers. The solution is simple: spread electrical loads across multiple circuits and avoid daisy-chaining power strips. If you're constantly tripping breakers, you need additional circuits installed by a licensed electrician.

**Faulty or damaged wiring** ranks as the second major cause, particularly in older homes. Knob and tube wiring (common in pre-1950s NB homes) becomes dangerous when insulation is added around it, creating fire risks. Aluminum wiring from the 1960s-70s can overheat at connections. Rodent damage to wiring in basements and attics also creates fire hazards. Any burning smell, flickering lights, or warm outlets requires immediate professional inspection.

**Defective electrical panels** pose serious risks, especially Federal Pacific and Zinsco panels installed in many New Brunswick homes from the 1950s-1980s. These panels often fail to trip during overloads, allowing dangerous heat buildup. TSANB strongly recommends replacing these panels. Modern homes should have 200-amp panels with AFCI (Arc Fault Circuit Interrupter) breakers that detect dangerous arcing conditions.

**Extension cord misuse** causes thousands of fires annually. Never run extension cords under carpets, through walls, or permanently for appliances. Heavy-duty appliances like space heaters, microwaves, and power tools should plug directly into outlets. If you need permanent power somewhere, have a licensed electrician install a proper outlet.

**Outlet and switch problems** develop over time, especially in older homes. Loose connections create heat and arcing. GFCI outlets in bathrooms, kitchens, and outdoor locations (required by the Canadian Electrical Code in New Brunswick) prevent both fires and electrocution. Tamper-resistant outlets protect children and prevent foreign objects from causing shorts.

**Space heater safety** becomes critical during New Brunswick's harsh winters. Keep heaters at least three feet from combustible materials, never use extension cords, and choose models with automatic shut-off features. Baseboard heaters need clear airflow - never place furniture or curtains nearby.

**Prevention strategies** include annual electrical inspections, especially for homes over 25 years old. Replace any outlets or switches that feel warm, spark, or don't hold plugs securely. Install smoke detectors on every level and in every bedroom - they must be interconnected and on a dedicated circuit per TSANB requirements. Consider whole-home surge protection to prevent damage from New Brunswick's frequent thunderstorms.

**Professional inspection** is essential if you notice burning smells, frequent breaker trips, flickering lights, or warm outlets. These warning signs indicate dangerous conditions requiring immediate attention. Licensed electricians can identify problems before they become fires, and TSANB permits ensure work meets safety standards.

Need help finding an electrician for an electrical safety inspection? New Brunswick Electrical can match you with qualified local professionals who understand Maritime electrical challenges and TSANB requirements.

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Q2

## What electrical safety checks should I do before buying an older home in New Brunswick?

**Before buying an older NB home, hire a licensed electrician for a dedicated electrical inspection beyond the standard home inspection — it costs \$200-\$400 and can save you thousands in unexpected repairs.**

### Why the standard home inspection isn't enough:

A general home inspector checks visible electrical components but typically doesn't open panels, test individual circuits, or evaluate wiring behind walls. In New Brunswick's older housing stock — particularly pre-1980 homes common across Moncton, Fredericton, and Saint John — hidden electrical issues are among the most expensive surprises for new homeowners.

## Critical checks for NB homes by era:

### Pre-1950 homes (common in Saint John, Fredericton downtown):

- **Knob and tube wiring:** Still energized in many older NB homes. Not inherently dangerous if untouched, but cannot contact insulation and may need full replacement. Cost to rewire: \$15,000-\$30,000
- **60-amp fuse panel:** Severely undersized for modern use. Panel upgrade: \$2,500-\$4,500
- **Cloth-wrapped wiring:** Insulation deteriorates, exposing conductors. Urgent replacement needed if crumbling

### 1965-1976 homes:

- **Aluminum wiring:** Very common in NB homes from this era. Check every connection point for signs of overheating (discoloured outlets, melted plastic). Pigtailling remediation: \$2,500-\$5,000
- **100-amp panels:** May be adequate but check available capacity — electric baseboard heat often maxes these panels

### 1970s-1990 homes:

- **Federal Pacific Stab-Lok panels:** Known fire hazard — breakers fail to trip during overcurrent. If present, budget \$3,000-\$5,000 for replacement. This is non-negotiable
- **Zinsco/Sylvania panels:** Similar concerns to Federal Pacific
- **Backstab wiring connections:** Quick-connect terminals on outlets loosen over decades, causing arcing

### All older homes — check for:

- **Panel capacity:** Is it 100A or 200A? What's the available capacity after existing loads?
- **Grounding:** Are outlets properly grounded? Two-prong outlets throughout means ungrounded wiring
- **GFCI protection:** Required in bathrooms, kitchens, outdoors, garages. Often missing in pre-2000 homes
- **AFCI protection:** Required on bedroom circuits. Missing in pre-2015 installations
- **Permit history:** Check with TSANB if electrical work was done — unpermitted work is a red flag
- **Visible hazards:** Open junction boxes, exposed wires in basement or attic, double-tapped breakers, oversized fuses

### How to use findings in negotiations:

- Get the electrician's report in writing with estimated repair costs
- Request a price reduction or have the seller complete repairs before closing
- Major electrical issues (full rewire, panel replacement) can justify \$10,000-\$30,000 in price negotiation
- Some NB mortgage lenders require panel replacements (especially Federal Pacific) before funding

### Insurance implications:

- Many NB insurers won't cover homes with knob and tube, aluminum wiring, or Federal Pacific panels without remediation
- Get insurance quotes BEFORE making an offer — you may discover the home is uninsurable without significant electrical upgrades
- Ask the insurer specifically about known panel brands and wiring types

**Your action plan:** Make your purchase offer conditional on a satisfactory electrical inspection by a licensed electrician. This costs you \$200-\$400 and provides ammunition for negotiation or a clear exit if the issues are too severe.

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Q3

## How do I childproof electrical outlets and what does the code require in New Brunswick?

Electrical outlets are one of the leading sources of childhood electrical injury in Canadian homes. Young children are naturally curious about those small slots in the wall at exactly their eye level. New Brunswick building code and the Canadian Electrical Code have specific requirements for tamper-resistant outlets, and there are additional steps parents can take beyond code minimums.

### CEC Code Requirements

The Canadian Electrical Code (CEC) has required **tamper-resistant receptacles (TRRs)** in new construction and renovations since the 2015 edition of the code. TSANB enforces this requirement in New Brunswick.

## What's required:

- All **15-amp and 20-amp, 125V receptacles** in dwelling units must be tamper-resistant
- This applies to every outlet in the home — bedrooms, living rooms, kitchens, bathrooms, basements, garages
- Applies to new construction and any renovation where outlets are replaced or new circuits are added
- Does NOT retroactively require replacement of existing outlets in older homes (unless those outlets are being modified as part of other work)

**What tamper-resistant means:** TRR outlets have **internal spring-loaded shutters** that cover the contact slots. Both shutters must be depressed simultaneously (as happens when inserting a standard plug with two or three prongs) to open. A child poking a single object (paperclip, key, fork, finger) into one slot cannot open the shutter — the mechanism requires simultaneous equal pressure on both slots.

TRR outlets are identified by the letters "**TR**" stamped on the face of the receptacle between the slots. They look and function identically to standard outlets when inserting a normal plug — adults don't notice any difference in daily use.

## How Tamper-Resistant Outlets Work

The internal mechanism is elegantly simple:

- Two spring-loaded plastic shutters sit behind the outlet slots
  - Each shutter blocks access to the energized contact behind it
  - When a plug is inserted, **both prongs press both shutters simultaneously** with roughly equal force
  - The shutters are mechanically linked — they only open when **both** are pressed at the same time
  - A single object in one slot pushes only one shutter, which stays locked because the other shutter isn't engaged
- This mechanism has been proven in testing to resist children's attempts to insert objects. The CPSC (Consumer Product Safety Commission) testing protocol involves children ages 2–4 attempting to insert various objects into the outlet — TRR outlets have a near-perfect safety record in these tests.

## Upgrading Existing Outlets

If your NB home was built before TRR outlets were required (pre-2015), your existing outlets are almost certainly standard (non-tamper-resistant). Upgrading is straightforward:

### DIY replacement:

- Turn off the breaker for the circuit
- Verify power is off with a voltage tester

- Remove the old outlet (two screws holding it in the box, then disconnect wires)
- Connect wires to the new TRR outlet (same connections — hot to brass screw, neutral to silver screw, ground to green screw)
- Secure in box and install cover plate

#### **Cost per outlet:**

- TRR outlet: **\$3–\$6 each** (very inexpensive — available at Kent Building Supplies, Home Hardware, Canadian Tire)
- DIY time: 10–15 minutes per outlet
- Electrician: **\$10–\$20 per outlet** for labour if you prefer professional installation

**A whole-house upgrade** (20–30 outlets in a typical NB home): **\$60–\$180 DIY** or **\$300–\$600 with an electrician**. No TSANB permit is required for like-for-like outlet replacement (same box, same wiring).

### **Beyond Code: Additional Childproofing Measures**

While TRR outlets provide excellent protection against the most common hazard (inserting objects into unused outlets), additional measures further reduce risk:

#### **Outlet Covers and Plates**

**Sliding cover plates:** These decorative plates have a spring-loaded sliding cover that closes over the outlet slots when no plug is inserted. The cover slides aside when you insert a plug. Cost: **\$3–\$8 each**. Advantage: works even if you haven't upgraded to TRR outlets.

**Box-type outlet covers:** Clear plastic boxes that cover the entire outlet, including any plugged-in cords. The cord exits through a small slot in the bottom. Prevents children from pulling plugs out and accessing the partially exposed prongs. Cost: **\$3–\$5 each**. Essential for outlets where cords remain plugged in (behind the TV, computer area, nightstand chargers).

**Blank plates:** For outlets that are never used (behind furniture, in storage areas), replace the outlet cover plate with a **blank cover plate** — a solid plate with no outlet openings. Cost: **\$1–\$2 each**. The ultimate protection for unused locations.

#### **Plug Inserts (The Cheap But Flawed Option)**

The small plastic plug inserts that push into unused outlet slots are the most commonly purchased childproofing product — and arguably the **least effective**:

- Children as young as 2 can learn to pull them out (they're designed to be removed easily by adults)

- Once removed, they become a **choking hazard** (perfectly sized for a toddler's airway)
- They give a false sense of security
- They fall out and get lost, leaving the outlet unprotected

**Recommendation:** Skip the plug inserts entirely. TRR outlets are far more effective, can't be removed by children, and don't create a choking risk. The cost difference is minimal (\$3 for inserts vs. \$3–\$6 for a TRR outlet that permanently solves the problem).

## Cord Management

Electrical cords are a hazard beyond just the outlets:

- **Cord shorteners:** Wind excess cord length into a cord shortener to eliminate loops that children can wrap around themselves. Cost: **\$3–\$8 each**.
- **Cord covers:** Adhesive plastic channels that attach cords to the wall, keeping them out of reach and preventing tugging. Cost: **\$5–\$15 per 6-foot length**.
- **Behind-furniture cord management:** Use velcro ties or cable management boxes to bundle cords behind entertainment centres and desks where children might reach.

## GFCI Protection

While not specifically a childproofing measure, **GFCI outlets in areas where children play** provide critical shock protection:

- All bathroom outlets must be GFCI-protected (CEC requirement)
- Kitchen countertop outlets must be GFCI-protected (CEC requirement)
- Consider adding GFCI protection to playroom, nursery, and basement outlets where children spend time — especially in older NB homes where these outlets may not currently have GFCI protection

A GFCI outlet trips in **1/40th of a second** when it detects a ground fault — fast enough to prevent serious injury if a child manages to contact a live conductor.

**GFCI + TRR combination outlets** are available — a single device that provides both tamper resistance and ground fault protection. Cost: **\$15–\$25 each** (more than a standard TRR but provides dual protection).

## Room-by-Room Priority

Focus childproofing efforts on the areas where young children spend the most unsupervised time:

**Highest priority:**

- Nursery/child's bedroom — all outlets to TRR, cord management on lamps and monitors
- Living room/playroom — TRR outlets, box covers on outlets with plugged-in cords, cord management
- Kitchen — already GFCI-protected per code, but add TRR if outlets are standard; keep small appliance cords out of reach

**Medium priority:**

- Hallways and common areas — TRR outlets
- Bathrooms — already GFCI-protected; add TRR and keep appliance cords (hair dryers, curling irons) unplugged and stored when not in use

**Lower priority (but still recommended):**

- Basement — TRR outlets, especially in finished areas
- Garage — TRR outlets; keep power tool cords managed and tools unplugged
- Outdoor outlets — should already have weatherproof covers; add TRR if replacing

**Cost Summary for Whole-Home Childproofing**

Item	Quantity (typical NB home)	Cost	----- ----- -----	TRR outlets	25–35	\$75–\$210	
Box-type cord covers	5–8	\$15–\$40		Sliding cover plates (high-traffic areas)	5–10	\$15–\$80	
GFCI+TRR combo (playroom, nursery)	2–4	\$30–\$100		Cord management (shorteners, covers)	Assorted	\$20–\$50	
<b>Total DIY  </b>	<b>  </b>	<b>\$155–\$480  </b>	<b>  </b>	<b>Total with electrician  </b>	<b>  </b>	<b>\$400–\$900  </b>	

For most New Brunswick families, a **\$200–\$400 investment** in TRR outlets and basic cord management provides comprehensive electrical childproofing that meets code requirements and exceeds them in high-risk areas. It's one of the most cost-effective child safety improvements you can make in your home.

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## How do I protect my electronics from power surges during New Brunswick thunderstorms?

New Brunswick experiences frequent thunderstorms from June through September, and the combination of overhead power lines, long rural distribution runs, and Maritime lightning activity means power surges are a regular threat to your electronics and appliances. A layered protection approach keeps your equipment safe.

### Understanding Power Surges in NB

A power surge is a brief spike in voltage — sometimes lasting just millionths of a second — that exceeds the normal 120V (or 240V) your home receives from NB Power. Surges can range from minor (a few volts above normal) to catastrophic (thousands of volts from a direct lightning strike).

#### Common surge sources in New Brunswick:

- **Lightning:** The most dramatic source. A lightning strike on or near a power line can send a massive surge through the distribution system. You don't need a direct hit on your home — a strike within several kilometres of your NB Power feeder line can propagate a damaging surge to your outlets.
- **NB Power switching:** When NB Power switches circuits to reroute power (common during storm restoration, maintenance, or after outages), the reconnection can produce a voltage spike. This is particularly common in areas served by long feeder lines — much of rural NB.
- **Tree contact:** Branches touching power lines during wind (extremely common in NB's forested landscape) cause brief interruptions and associated surges when contact breaks and reconnects.
- **Internal surges:** Your own appliances create small surges every time a motor starts — refrigerator compressor, furnace blower, well pump, air conditioner. These are small but cumulative over time and can degrade sensitive electronics.

### Layer 1: Whole-House Surge Protector (Primary Protection)

A whole-house surge protection device (SPD) is installed at your main electrical panel by a licensed electrician. It clamps voltage spikes before they reach any circuit in your home.

**How it works:** The SPD monitors the voltage on both 120V legs of your service. When voltage exceeds a set threshold (typically 150–170V), metal oxide varistors (MOVs) inside the device absorb the excess energy and shunt it safely to ground in nanoseconds.

### Specifications to look for:

- **Type 1 or Type 2 SPD** (Type 2 is most common for residential panel installation)
- **Surge current capacity: minimum 50,000 amps (50 kA)**, preferably 80–100 kA
- **Clamping voltage: 600V or less** at the service entrance
- **All-mode protection:** L-N, L-G, and N-G (line to neutral, line to ground, neutral to ground)
- **UL 1449 or CSA C22.2 No. 269 listed**
- **LED status indicator** showing the device is functional

### Recommended products:

- Eaton CHSPT2ULTRA (whole-house, 108 kA) — **\$100–\$150**
- Siemens FS140 (whole-house, 140 kA) — **\$150–\$200**
- Square D SDSB1175T (whole-house, 80 kA) — **\$80–\$120**
- Leviton 51120-1 (panel mount, 50 kA) — **\$80–\$100**

**Installation cost: \$200–\$500** total (device + electrician labour + TSANB permit). A TSANB permit is required since the SPD connects directly to the panel.

**This is the single most cost-effective protection investment.** For \$200–\$500 installed, you protect every circuit and every device in your home simultaneously.

## Layer 2: Point-of-Use Surge Protectors (Secondary Protection)

Even with a whole-house SPD, residual surge energy can still reach sensitive equipment. Point-of-use surge protectors at individual outlets provide a second line of defense.

### Where to use point-of-use protection:

- Computer workstation (desktop, monitor, printer, router)
- Home entertainment system (TV, receiver, gaming consoles)
- Home office equipment (laptop charger, external drives, NAS)
- Network equipment (modem, router, switches)
- Any equipment costing over \$500

### What to look for in a quality surge protector strip:

- **Joule rating: minimum 2,000 joules**, preferably 3,000+ joules
- **Clamping voltage: 400V or less** (lower is better)
- **Response time: 1 nanosecond or less**

- **UL 1449 listed** (not just "UL approved" or "meets UL standards" — it must be **listed**)
- **LED indicator** showing protection is active
- **Connected equipment warranty** — reputable brands (APC, Tripp Lite, CyberPower, Belkin) offer \$25,000–\$300,000 warranties on connected equipment damaged by surges

**Recommended products:**

- APC SurgeArrest P11VT3 (11 outlets, 3020 joules, tel/coax) — **\$40–\$60**
- Tripp Lite TLP1208TELTV (12 outlets, 2880 joules, tel/coax) — **\$35–\$50**
- CyberPower CP1500PFCLCD (UPS + surge, battery backup) — **\$200–\$300**

**Important:** Cheap power bars from dollar stores are NOT surge protectors. They're just multi-outlet adapters with no surge protection capability. Look for the UL 1449 listing and a joule rating.

### **Layer 3: Uninterruptible Power Supply (UPS) for Critical Equipment**

A UPS combines surge protection with battery backup, keeping equipment running during brief outages and providing clean power during brownouts.

**Essential for:**

- Desktop computers (prevents data loss and hard drive corruption during sudden shutoffs)
- Network-attached storage (NAS) devices
- Modems and routers (keeps internet running during brief flickers — NB Power's momentary outages are frequent during storms)
- Security systems and cameras
- Medical equipment (CPAP machines, oxygen concentrators)

**UPS sizing:** Match the UPS to your equipment's total wattage. A **1,000–1,500 VA (600–900W)** UPS handles a typical desktop computer setup and provides **10–20 minutes of battery backup** — enough time to save work and shut down properly.

**Cost: \$100–\$300** for a quality 1000–1500 VA UPS from APC, CyberPower, or Tripp Lite.

### **Layer 4: Telephone and Cable/Internet Line Protection**

Surges enter your home through more than just the power lines. Telephone lines, coaxial cable, and ethernet cables can also carry surge energy — especially in rural NB where overhead telephone and cable lines run alongside power lines for long distances.

**Protection options:**

- **Whole-house telephone/cable surge protector:** Installed at the service entrance point where phone/cable enters the home. Cost: **\$20–\$50** for the device, plus electrician installation.
- **Surge protector strips with phone/coax ports:** Many quality surge strips include RJ-11 (phone) and coax (cable) pass-through protection. Use these for equipment connected to both power and data lines.
- **Ethernet surge protectors:** If you run wired ethernet to multiple rooms, inline ethernet surge protectors ( **\$15–\$30 each**) protect network equipment.

## **New Brunswick-Specific Recommendations**

### **Rural properties (Miramichi, Bathurst, Campbellton, Upper Saint John Valley):**

- Whole-house SPD is essential — long rural feeder lines experience more frequent and severe surges
- Consider a UPS for your well pump controller if you have one — brief power flickers are more common on rural lines and can cycle your well pump on and off rapidly, shortening its life
- Generator transfer switch should include surge protection if you use a standby or portable generator

### **Coastal properties (Shediac, St. Andrews, Grand Manan, Acadian Peninsula):**

- Salt air corrodes standard surge protectors faster — check LED status indicators annually
- Lightning risk is elevated near water — the Bay of Fundy coast and Northumberland Strait see frequent summer thunderstorm activity
- Whole-house SPD is strongly recommended

### **Urban Moncton/Fredericton/Saint John:**

- Surge risk is lower than rural areas (shorter distribution lines, more substations) but still real
- Whole-house SPD plus point-of-use protection for valuable electronics is the right balance

## **What to Do After a Major Surge**

If lightning strikes near your home or you experience a major power event:

- **Check your whole-house SPD status light** — if the indicator shows the device has absorbed a major surge, it may need replacement (MOVs degrade with each surge absorbed)
- **Check point-of-use surge protectors** — replace any that show their protection indicator is off
- **Inspect electronics before turning them on** — look for burn smells, won't-start conditions, or error messages
- **Document any damage** for insurance — photograph damaged equipment, keep receipts, and note the date and time of the surge event

- **File an NB Power claim** if applicable — NB Power has a claims process for equipment damaged by surges on their distribution system

## Total Protection Cost Summary

| Layer | Cost | Protects | |-----|-----|-----| | Whole-house SPD (installed) | \$200–\$500 | Everything in the home | | Surge strip (computer area) | \$40–\$60 | Computer, monitor, peripherals | | Surge strip (entertainment) | \$35–\$50 | TV, receiver, gaming | | UPS (desktop computer) | \$150–\$300 | Computer + 10–20 min battery | | UPS (modem/router) | \$60–\$100 | Internet during flickers | | **Total comprehensive setup** | **\$485–\$1,010** | **Full protection** |

For most New Brunswick homeowners, **\$500–\$700 provides excellent multi-layer surge protection** for the entire home and all valuable electronics. That's roughly the replacement cost of a single TV or computer — making it one of the best insurance policies you can buy.

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Q5

## How do I safely use a portable generator during a power outage in New Brunswick?

Portable generators save lives and protect property during New Brunswick's frequent power outages — but improper use kills people every year across Canada. Carbon monoxide poisoning, electrocution, and fire are all preventable risks when you follow proper safety practices.

### The Number One Rule: NEVER Run a Generator Indoors

This cannot be overstated. **A portable generator produces deadly carbon monoxide (CO) gas** and must never be operated:

- Inside your home
- In an attached or detached garage (even with the door open)
- In a basement or crawlspace
- On a covered porch or in a breezeway
- In any enclosed or semi-enclosed space

CO is colourless and odourless. It accumulates quickly in enclosed spaces and can kill within minutes. Every year in Canada, people die from generator CO poisoning during power outages — often during winter storms when the temptation to bring the generator "just inside the garage" is strongest.

#### **Proper placement:**

- At least **6 metres (20 feet) from any door, window, or vent opening** — including your neighbours' homes
- In an open, well-ventilated outdoor area
- On a flat, dry surface (plywood on snow works in a pinch)
- With the exhaust pointing **away** from the house and away from prevailing winds
- Under a canopy or tarp shelter is acceptable for rain/snow protection, but the sides must be open for ventilation

#### **Carbon Monoxide Detectors: Your Backup Safety Net**

Even with proper generator placement, ensure your home has **working CO detectors on every level**, including the basement. New Brunswick building code requires CO detectors in homes with fuel-burning appliances, but they're essential during generator use regardless.

- Test batteries before storm season (September) and again in December
- Replace CO detectors every **5–7 years** (check the manufacture date on the back)
- If a CO alarm sounds, **immediately evacuate** and call 911 — don't try to find the source
- Battery-powered or battery-backup CO detectors work during power outages; plug-in-only models don't

#### **Electrical Safety: Never Backfeed Your Panel**

**Backfeeding** — plugging a generator into a wall outlet or dryer outlet to power your home's circuits — is **illegal, deadly, and the most dangerous generator mistake you can make.**

Here's why: when you backfeed, electricity flows backward through your panel, out through the meter, and onto NB Power's distribution lines. It reaches the transformer, is **stepped up to 7,200 volts or higher**, and energizes what NB Power line workers believe are dead wires. Utility workers have been killed by backfed generators.

### **The only safe ways to connect a generator to your home's wiring:**

- **Transfer switch (manual):** A licensed electrician installs a transfer switch panel that lets you select which circuits receive generator power while physically disconnecting those circuits from the grid. Cost: **\$500–\$1,200 installed**, plus TSANB permit. This is the recommended approach for portable generators.
- **Interlock kit:** A mechanical device installed on your main panel that prevents the main breaker and generator breaker from being on simultaneously. Less expensive than a transfer switch (**\$200–\$500 installed**) but still requires a licensed electrician and TSANB inspection.
- **Extension cords only:** Run heavy-duty extension cords directly from the generator to individual appliances. No panel connection at all. This is the simplest approach and requires no electrician, but limits you to powering only what you can plug in directly.

### **Extension Cord Safety**

If using extension cords (which most NB homeowners do with portable generators):

- Use **outdoor-rated, heavy-gauge cords** — minimum **12-gauge for up to 50 feet, 10-gauge for 50–100 feet**
- Check the cord's wattage rating — it must exceed the total wattage of everything plugged into it
- **Never daisy-chain** extension cords (plugging one into another)
- Keep connections off the ground and out of standing water or snow
- Don't run cords under rugs, through doorways that can pinch them, or through windows that close on them
- Inspect cords for damage before each use — cracked insulation, exposed wire, or loose plug prongs mean the cord must be replaced

### **Fuel Safety**

#### **Gasoline handling is the second-biggest generator risk after CO poisoning:**

- **Never refuel a running or hot generator.** Turn it off and wait at least **5 minutes** for it to cool. Gasoline spilled on a hot exhaust manifold ignites instantly.
- Store gasoline in **approved containers only** (CSA-approved red jerry cans)
- Keep fuel storage at least **3 metres from the generator** and any ignition source

- Store fuel in a **well-ventilated area** — not in your basement, not in your attached garage, not near your furnace or water heater
- Gasoline goes stale after **30–60 days**. Add fuel stabilizer (like Sta-Bil) if storing gas for outage preparedness — common in NB where hurricane season and ice storm season don't overlap but both require preparation
- **Don't hoard excessive fuel** — 20–40 litres is sufficient for most portable generators to run essential loads for 24–48 hours

## Sizing: Don't Overload Your Generator

Overloading a portable generator damages it, can damage your appliances, and creates fire risk:

- Know your generator's **rated (continuous) watts** vs. **maximum (surge) watts** — rated watts is what it can sustain, surge watts is only for brief motor-starting loads
- Add up the running wattage of everything you plan to plug in
- Stay at or below **80% of rated capacity** for sustained operation
- Start the **largest load first** (refrigerator, well pump) before adding smaller loads
- Never exceed the rated capacity — the generator won't "just slow down," it produces dirty power that damages electronics and motor windings

### Common portable generator sizes and what they realistically power:

| Generator Size | What It Powers | |-----|-----| | 2,000W (inverter) | Phone/laptop charging, LED lights, small appliances | | 3,500W | Refrigerator + freezer + lights + small appliances | | 5,000W | Above + well pump OR sump pump (not both simultaneously) | | 7,500W | Above + well pump + sump pump + window AC or space heater | | 10,000W+ | Most essential home loads (not including electric baseboard heat or range) |

## New Brunswick-Specific Considerations

**Winter operation:** NB's cold temperatures affect generator performance:

- Use **winter-grade oil** (5W-30 or synthetic) in temperatures below -10°C
- Cold gasoline vaporizes poorly — generators can be hard to start; keep in a sheltered area (not enclosed) before starting
- Clear snow away from the generator and especially from the exhaust
- Don't let snow accumulate and melt into the generator's air intake or electrical outlets

**Well pump cycling:** Many rural NB homes rely on well pumps. A well pump's **starting surge is 2–3 times its running watts** — a 1/2 HP pump runs at 750W but surges to 1,500–2,000W on startup. Plan generator capacity

accordingly and avoid starting the pump while other heavy loads are running.

**Freezer priority:** During extended outages (24+ hours, common in rural NB after ice storms), keeping your freezer running is a priority — a full freezer stays frozen for about 48 hours without power, but a half-full one only 24 hours. Running the generator for **2–3 hours twice daily** is enough to keep a freezer cold if you can't run the generator continuously.

**NB Power restoration priority:** NB Power restores power to the greatest number of customers first, which means rural feeders serving few homes are last. If you live on a rural road in areas like Chipman, Doaktown, Plaster Rock, or the Kingston Peninsula, plan for **3–7 day outages** during major storms and size your fuel supply accordingly.

## Before Storm Season Checklist

- Start and run your generator for **15–30 minutes monthly** — engines that sit unused don't start when you need them
- Change oil annually (or every 100 hours of operation)
- Check/replace spark plug annually
- Verify CO detectors work on battery backup
- Stock **20–40 litres of stabilized gasoline**
- Test extension cords — check for damage, verify gauge
- Know your generator's rated wattage and your essential loads
- If you have a transfer switch, test the changeover

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## Are space heaters safe to use in New Brunswick and what should I watch for?

### Space Heater Safety for New Brunswick Homes

Portable space heaters are a fixture of NB winters — used to supplement baseboard heating, warm cold rooms, and heat garages and workshops. They're also responsible for a disproportionate share of residential electrical fires. Here's how to use them safely.

### The Numbers

Portable space heaters cause an estimated 1,700 residential fires per year in Canada, resulting in dozens of deaths and hundreds of injuries. The leading causes:

- Space heater placed too close to combustible materials (curtains, bedding, furniture): **45% of fires**
- Space heater left unattended or used while sleeping: **25% of fires**
- Electrical failure (overloaded circuit, damaged cord, faulty heater): **20% of fires**
- Other (tipped over, children playing): **10% of fires**

### Safe Space Heater Use

#### 1. Plug directly into a wall outlet — NEVER an extension cord

This is the single most important rule. A 1,500W space heater draws 12.5 amps — near the limit of most extension cords. An overloaded extension cord heats up silently and can ignite carpet, furniture, or the cord itself.

If the wall outlet is too far away, move the heater — don't add a cord.

#### 2. Keep 1 metre (3 feet) of clearance on all sides

Nothing combustible within 1 metre of the heater: no curtains, bedding, towels, paper, clothing, or furniture. This applies to all sides, top, and front. Pay special attention to:

- Bedroom curtains (the most common ignition source)
- Bedding hanging off the side of a bed
- Clothing left draped over furniture near the heater
- Stacked cardboard or paper in basements and garages

#### 3. Never leave a space heater unattended or use while sleeping

If you leave the room, turn off the heater. If you go to sleep, turn off the heater. Modern heaters with timers and thermostats are better than older models, but unattended operation is always a risk.

#### **4. Use one heater per outlet, one heater per circuit**

A standard 15-amp circuit can safely handle 1,440 watts continuously (80% rule). A single 1,500W space heater already exceeds this. Plugging two space heaters into the same circuit will trip the breaker — or worse, overheat the wiring if the breaker is oversized.

If you need to heat multiple rooms, each heater should be on a different circuit. Check your panel to confirm which outlets are on which circuits.

#### **5. Place on a hard, flat surface**

Never place a space heater on carpet, a rug, a bed, a couch, or a shelf. Soft surfaces can block the heater's air intake and cause overheating. Hard, level floors (hardwood, tile, concrete) are safest.

#### **6. Check for CSA or ULC certification**

Only use space heaters certified by CSA (Canadian Standards Association) or ULC (Underwriters Laboratories of Canada). The certification mark should be on the heater's label. Uncertified heaters from overseas may lack safety features like tip-over switches and overheat protection.

## **Types of Space Heaters**

### **Ceramic fan heaters (\$30–\$80)**

- Blow warm air across a ceramic heating element
- Heat a room quickly but lose heat quickly when turned off
- Can be noisy (fan)
- Good for: quick warmth in a bathroom or office

### **Oil-filled radiators (\$50–\$150)**

- Sealed oil reservoir heated by an electric element
- No fan — silent operation
- Retain heat after being turned off (the oil stays warm)
- Good for: bedrooms, living rooms, overnight use (with a timer)
- Safer than fan heaters because the surface temperature is lower

### **Infrared/radiant heaters (\$50–\$200)**

- Emit infrared radiation that heats objects and people directly
- Don't heat the air (room air stays cool, but you feel warm in front of the heater)
- Good for: garages, workshops, spot heating
- Caution: the front element gets very hot — keep extra distance from combustibles

### **Panel heaters (\$100–\$300)**

- Flat, wall-mounted panels that radiate gentle heat
- Low surface temperature (can't cause burns)
- Good for: bathrooms, hallways, supplementing baseboard
- Least fire risk of all portable heater types

### **Electrical Warning Signs**

Stop using a space heater immediately if:

- The outlet or plug feels warm or hot
- You see discolouration or melting on the plug or outlet
- The heater's cord is damaged, frayed, or repaired with tape
- The heater trips the breaker repeatedly
- You smell burning plastic
- The heater makes unusual sounds (arcing, buzzing, clicking)

### **Better Alternatives to Space Heaters**

If you're relying on space heaters because your home doesn't stay warm enough:

**Mini-split heat pump (\$3,500–\$6,000 installed):** Delivers 2.5–3.5 times more heat per watt than any space heater. A single mini-split in the main living area often eliminates the need for space heaters entirely. Operating cost is 60–70% less than baseboard for the same comfort.

**Smart baseboard thermostats (\$100–\$250 per zone):** If your baseboards aren't keeping up because their thermostats are inaccurate (common with old bimetallic thermostats), smart thermostats (Mysa, Sinopé) provide precise temperature control and scheduling. The room may be cold simply because the thermostat is miscalibrated.

**Insulation and air sealing (\$1,500–\$5,000):** If one room is always cold, the issue may be poor insulation or air leaks around windows and exterior walls. Fixing the building envelope is a permanent solution; a space heater is

a temporary bandage.

**Adding a baseboard heater (\$300–\$600 per heater installed):** If a room genuinely lacks heating capacity, adding a properly wired, thermostat-controlled baseboard heater is far safer than relying on a portable space heater indefinitely.

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## What does a home electrical inspection cover in New Brunswick?

### Home Electrical Inspections in New Brunswick: What to Expect

A home electrical inspection evaluates the safety and condition of your home's electrical system. In NB, there are two types: a TSANB permit inspection (required for new work) and a voluntary safety inspection (for peace of mind or insurance requirements).

### TSANB Permit Inspection vs. Voluntary Safety Inspection

#### TSANB permit inspection:

- Required when electrical work has been done under a permit
- Covers ONLY the work described on the permit (not the whole house)
- Performed by a TSANB inspector
- Pass/fail with deficiency list if items need correction
- Fee included in the permit cost

#### Voluntary safety inspection:

- Done by a TSANB-licensed electrician (not a TSANB inspector)
- Covers the entire electrical system
- Provides a written report of findings and recommendations
- Often required by insurance companies for older homes or homes with known issues (FPE panels, aluminum wiring, knob-and-tube)
- Cost: \$200–\$500 depending on home size and complexity

### What a Full Safety Inspection Covers

#### 1. Electrical panel

- Panel brand, age, and condition (checking for FPE, Zinsco, or other problem brands)
- Main breaker rating and service size (60A, 100A, 200A)
- Breaker condition — signs of overheating, corrosion, or damage
- Proper breaker sizing for each circuit's wire gauge
- Double-tapped breakers (two wires on a single breaker not rated for it)

- Proper grounding and bonding (ground bus, bonding jumper, grounding electrode conductor)
- Panel labelling — accurate circuit directory
- Available capacity for future needs

## **2. Service entrance**

- Condition of the service mast, weatherhead, and meter base
- Service entrance cable condition
- Proper clearances from ground, windows, and walkways
- Ground rod and grounding electrode connection

## **3. Wiring throughout the home**

- Wire type identification (NMD90 copper, aluminum, knob-and-tube)
- Wire condition where visible (attic, basement, crawlspace)
- Proper cable support and protection
- Nail plates where cables pass through framing
- Junction box covers in place and accessible
- No exposed splices outside of boxes

## **4. Outlets and switches**

- Sample testing of outlets with a three-light tester (correct wiring, grounding)
- GFCI presence and function in required locations (kitchen, bathroom, outdoor, garage, basement)
- Tamper-resistant receptacles where required
- Proper outlet spacing per CEC
- Switch function and condition

## **5. Smoke and CO detectors**

- Presence on all required levels
- Age (expiration date check)
- Function (test button)
- Interconnection (in newer homes)
- CO detector presence near fuel-burning appliances

## **6. Exterior electrical**

- Outdoor outlet condition and GFCI function

- Weather covers (in-use covers) present and functional
- Exterior light fixture condition
- Meter base and service entrance condition

### **7. Specific systems**

- Electric water heater (dedicated circuit, proper wiring)
- HVAC electrical connections
- Dryer and stove circuits (240V, proper receptacle type)
- Smoke detector circuits (hardwired homes)
- Any sub-panels (detached garage, basement suite)

### **What the Inspector Looks For (Common Findings in NB)**

Based on the age and style of NB housing stock, inspectors commonly find:

#### **Homes built before 1960:**

- Knob-and-tube wiring (partial or full)
- 60A fuse boxes
- No grounding on any circuits
- No GFCI protection anywhere
- Cloth-insulated wiring deterioration

#### **Homes built 1960–1980:**

- Aluminum wiring (1965–1976 era)
- 100A panels (sometimes FPE or Zinsco)
- Some grounded circuits, some not
- Missing GFCI in kitchens and bathrooms
- Overfused circuits in fuse boxes

#### **Homes built 1980–2000:**

- Generally adequate wiring
- 100A or 200A panels
- May be missing GFCI in garages and outdoor locations
- Backstab connections on outlets (prone to loosening)

- Smoke detectors past expiration

**Homes built 2000+:**

- Usually code-compliant
- May have outdated smoke/CO detectors
- Additions or renovations done without permits

**When to Get an Inspection**

- **Buying a home** — the general home inspection covers basic electrical, but a dedicated electrical inspection is worthwhile for homes built before 1980
- **Insurance request** — your insurer may require an inspection for older homes, homes with known issues, or when switching insurance providers
- **Before major renovations** — understand your starting point before adding new electrical load
- **After buying a home with unknown history** — especially if there's evidence of DIY electrical work
- **Peace of mind** — if you've never had the electrical inspected and the home is 25+ years old

**Cost and What You Get**

Service	Cost	What You Get
Basic safety inspection (1,500 sq ft home)	\$200–\$350	Written report, deficiency list, recommendations
Comprehensive inspection (larger/older home)	\$350–\$500	Detailed report, thermal imaging, full system assessment
Pre-purchase electrical inspection	\$250–\$400	Buyer-focused report with cost estimates for repairs
Insurance-required inspection	\$200–\$350	Report formatted for insurance submission

Most TSANB-licensed electricians in Moncton, Saint John, Fredericton, and surrounding areas offer inspection services. The inspection typically takes 2–4 hours depending on home size, and you'll receive a written report within 1–3 business days.

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**Q8**

## What happens if I overload an extension cord and how do I avoid it?

### Extension Cord Overload: Risks and Prevention

Extension cord overloads are a leading cause of residential electrical fires in Canada. In New Brunswick, where portable space heaters and holiday lighting are heavily used, the risk is especially high during winter months.

### What Happens When You Overload an Extension Cord

Every extension cord has a maximum amperage rating based on its wire gauge and length. When you plug in devices that draw more current than the cord can handle:

- **The cord heats up** — electrical resistance generates heat proportional to the square of the current. Double the current = four times the heat.
- **Insulation softens and can melt** — PVC insulation degrades at sustained temperatures above 60°C. An overloaded cord can reach 100°C+ internally.
- **Connections fail** — plug prongs and socket contacts overheat, causing arcing, melting, and intermittent contact
- **Fire ignition** — a hot cord draped over carpet, furniture, or bedding can ignite surrounding materials. A melted plug can arc and start a fire at the outlet.

The dangerous part: **your home's breaker may NOT trip.** The breaker protects the house wiring (14 AWG, rated for 15A). If the extension cord is 16 AWG (rated for 10–13A) and you draw 13A through it, the breaker sees 13A on a 15A circuit — no problem. But the cord is at or above its limit, overheating silently.

### Extension Cord Ratings

Wire Gauge (AWG)	Max Amps (up to 15m)	Max Watts (120V)	Typical Cord Type
16 AWG	10–13A	1,200–1,560W	Light-duty indoor
14 AWG	15A	1,800W	Medium-duty
12 AWG	20A	2,400W	Heavy-duty outdoor
10 AWG	25A	3,000W	Heavy-duty workshop

**Longer cords = lower capacity.** A 16 AWG cord rated for 13A at 3 metres may only safely carry 10A at 15 metres due to increased resistance. Always check the rating on the cord's label — it's usually stamped on the cord jacket.

## The Worst Offenders

**1. Space heaters on extension cords** A 1,500W space heater draws 12.5A — exceeding the safe capacity of most 16 AWG cords. This is the single most dangerous extension cord combination in NB homes during winter. Space heaters should ALWAYS be plugged directly into a wall outlet.

**2. Daisy-chained power strips** Plugging one power strip into another creates a single overloaded connection point at the first strip. If strip A is rated for 15A and you plug strip B into it with 10A of load, plus 8A directly on strip A, you're pushing 18A through strip A's cord and connections.

**3. Multiple high-draw kitchen appliances** Toaster (8A) + kettle (12A) = 20A through a cord rated for 13A.

**4. Outdoor holiday lighting on indoor cords** Indoor extension cords aren't weatherproofed. Rain, snow, and ice degrade the insulation, creating ground faults and shock hazards. Always use outdoor-rated cords (marked "W" or "W-A" on the jacket) for exterior use.

**5. Cords under rugs or through doorways** A cord under a rug can't dissipate heat. A cord pinched in a doorway has damaged insulation. Both create concentrated hot spots.

## How to Use Extension Cords Safely

**1. Match the cord to the load** Add up the wattage of everything plugged into the cord. Use a cord rated above that total. For space heaters: 14 AWG minimum, direct connection to wall outlet preferred.

**2. Never use extension cords as permanent wiring** Extension cords are for temporary use. If you need power somewhere permanently, have an electrician install an outlet. In NB, a new outlet installation costs \$200–\$400 — far less than fire damage.

### 3. Inspect cords regularly

- Check for cracked, frayed, or melted insulation
- Feel the cord while under load — warm is normal, hot is dangerous
- Check plug prongs for discolouration or bending
- Replace any damaged cord immediately — don't tape it

**4. Unplug when not in use** A plugged-in extension cord with nothing connected still draws a tiny current and remains energized. Unplug cords when not actively using them.

**5. Use power bars with built-in breakers** Quality power bars (not cheap power strips) have a built-in circuit breaker that trips if the load exceeds the bar's rating. Look for CSA or ULC certification.

**6. One cord per outlet** Don't plug multiple extension cords into a single duplex outlet. Each outlet has a maximum capacity shared between both sockets.

### When to Install Permanent Outlets Instead

If you find yourself relying on extension cords in the same locations repeatedly, it's time for permanent wiring:

- Bed that's far from a wall outlet ? add a receptacle behind the nightstand
- Desk in a room corner ? add a receptacle at desk height
- Workshop with tools spread across the bench ? add outlets every 1.2m along the bench
- Outdoor entertaining area ? add weatherproof GFCI outlets on the deck or patio

A TSANB-licensed electrician can add outlets for \$200–\$400 each in most NB homes. It's a permanent solution that eliminates the fire risk of extension cords entirely.

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Q9

## What is the best way to childproof electrical outlets in New Brunswick?

### Childproofing Electrical Outlets in Your New Brunswick Home

Electrical outlets are one of the most accessible hazards for young children. Small fingers fit perfectly into outlet slots, and the curiosity of toddlers makes unprotected outlets a real danger. Here's what works, what doesn't, and what the code requires.

## **Tamper-Resistant Receptacles (TRRs) — The Best Solution**

Tamper-resistant receptacles look like regular outlets but have built-in spring-loaded shutters behind the slot openings. Both shutters must be pushed simultaneously (as when inserting a plug) to open — a child pushing a single object into one slot can't bypass the shutters.

**The CEC now requires tamper-resistant receptacles** in all new construction and renovations where receptacles are being installed or replaced. This applies to all 125V, 15A and 20A receptacles in dwelling units.

TRRs are the gold standard because:

- They're built into the outlet — nothing to forget, lose, or remove
- They work permanently with no maintenance
- They don't interfere with normal plug insertion
- They're tested to withstand children's attempts to defeat them
- They cost only \$1–\$3 more than standard receptacles

## **Outlet Covers and Caps — A Temporary Measure**

**Plastic plug caps** (\$3–\$8 for a pack of 20) are the most common childproofing method, but they have significant limitations:

- Children as young as 2 can learn to remove them
- They're a choking hazard once removed
- Parents forget to replace them after unplugging devices
- They wear out and fit loosely after repeated use

**Sliding outlet covers** (\$3–\$8 each) replace the standard cover plate with one that has spring-loaded panels that slide over the slots when a plug is removed. Better than caps because they can't be removed by a child or lost, but the sliding mechanism can fail over time.

**Box covers** (\$5–\$15 each) enclose the entire outlet and any plugged-in cord behind a plastic housing. Good for cords that stay plugged in (lamps, phone chargers) but bulky and not practical for frequently used outlets.

## **What the Canadian Electrical Code Requires**

For new construction and renovations in New Brunswick:

- **All 125V receptacles** in dwelling units must be tamper-resistant (CEC Rule 26-720(f))
- This includes bedrooms, living rooms, kitchens, hallways, bathrooms, and any other habitable space
- Exceptions: receptacles more than 1.5m above the floor, receptacles behind heavy appliances (stove, refrigerator), and some dedicated-purpose receptacles

Existing homes are not required to retrofit, but replacing outlets during any electrical work triggers the current code requirement for that outlet.

## DIY Replacement

Replacing a standard outlet with a tamper-resistant model is one of the simplest electrical tasks a homeowner can do:

- **Turn off the breaker** for the circuit
- **Verify power is off** with a non-contact voltage tester (\$15–\$25 at any hardware store)
- **Remove the cover plate and unscrew the outlet** from the box
- **Note which wires connect where** — take a photo
- **Connect wires to the new TRR** in the same configuration
- **Screw the outlet into the box and replace the cover plate**
- **Restore power and test**

Cost: \$2–\$4 per outlet for the TRR, available at any Home Depot, Kent, or Home Hardware in New Brunswick. A whole-house replacement of 20–30 outlets costs \$40–\$120 in materials and a few hours of time.

If you're not comfortable working with electrical, a licensed electrician will typically charge \$80–\$150 per service call plus \$10–\$20 per outlet for the swap — or \$250–\$500 for a whole-house TRR upgrade.

## Additional Childproofing Measures

**Power strips and extension cords:** Use power strip covers (\$8–\$15) to prevent children from pulling out plugs or pressing switches. Better yet, minimize power strip use in areas accessible to children.

**Cord management:** Dangling cords from lamps, chargers, and appliances are pulling hazards. Use cord clips, cord covers, or route cords behind furniture.

**GFCI protection:** Ensure all outlets accessible to children in bathrooms, kitchens, and outdoor areas have GFCI protection. A GFCI trips before a shock can cause serious injury.

**Outlet height:** In new construction or renovations, consider placing outlets at 18 inches (standard) or higher in playrooms and children's bedrooms. The higher placement puts outlets farther from a crawling baby's reach without being inconvenient for adults.

## Priority Areas

Focus childproofing on outlets that are:

- At child height (standard 12–18 inch mounting)
- In rooms where children spend unsupervised time
- Visually accessible (not behind furniture)
- Near water sources (bathroom, kitchen — should already have GFCI)
- Outdoors — deck, patio, garage

For NB families, replacing all accessible outlets with tamper-resistant receptacles is the most effective and permanent solution — and at \$2–\$4 each, it's one of the cheapest safety upgrades you can make.

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## Should I install a whole-house surge protector in New Brunswick?

### Whole-House Surge Protectors for New Brunswick Homes

New Brunswick's electrical grid faces significant surge risk from lightning storms, ice storms downing power lines, and NB Power grid switching events. A whole-house surge protector is one of the most cost-effective ways to protect your home's electronics and appliances.

### What Causes Electrical Surges

**Lightning (direct and nearby strikes):** New Brunswick sees 100–200+ lightning events per year, concentrated in summer. A direct strike on a power line sends thousands of volts into connected homes. Even a strike within 1–2 km induces surges through electromagnetic coupling. Southern NB (Moncton, Sussex, Saint John) and the Saint John River Valley see the most thunderstorm activity.

**Utility grid switching:** When NB Power switches transformers, reroutes power during maintenance, or restores power after an outage, transient voltage spikes travel through the grid. These are smaller than lightning but happen far more frequently — potentially dozens of times per year.

**Internal surges:** Large motors in your home (AC compressor, well pump, furnace blower, refrigerator) create small surges every time they cycle on. Over years, these micro-surges degrade electronic components. An estimated 60–80% of surge damage comes from internal sources.

**Ice storms and wind events:** When tree branches contact power lines during NB's frequent ice storms and post-tropical storms, it creates arcing and voltage spikes. The power may flicker on and off repeatedly before finally going out — each restoration cycle is a surge event.

### How Whole-House Surge Protectors Work

A whole-house surge protector (also called a Type 2 SPD — Surge Protection Device) installs at your electrical panel, either inside the panel or in a dedicated enclosure next to it. It monitors the voltage on all incoming circuits and diverts excess voltage to ground when a surge is detected.

Think of it as a pressure relief valve for your electrical system. Normal voltage (120V/240V) passes through unaffected. When voltage spikes above the clamping threshold (typically 300–400V), the SPD absorbs the excess energy and routes it to ground in nanoseconds.

### What It Protects

Everything connected to your electrical system:

- **Electronics:** TVs, computers, gaming consoles, home theatre equipment
- **Smart home devices:** WiFi routers, smart thermostats, smart switches, security cameras
- **Major appliances:** Refrigerator, washer, dryer (electronic control boards are expensive to replace)
- **HVAC equipment:** Heat pump control boards (\$300–\$800 to replace), furnace igniters
- **EV charger:** Level 2 charger electronics
- **Garage door openers, well pump controllers, sump pump controllers**

## What It Doesn't Protect Against

A direct lightning strike on your home or service entrance can overwhelm any surge protector. For maximum protection, combine the whole-house SPD with:

- **Point-of-use surge protectors** (\$15–\$40 each) on sensitive electronics
- **UPS (Uninterruptible Power Supply)** (\$80–\$300) for computers and network equipment

This layered approach — Type 2 at the panel plus Type 3 at the device — catches 99%+ of surge events.

## Costs in New Brunswick

| Component | Cost | |-----|-----| Whole-house surge protector (quality unit) | \$150–\$400 | | Electrician installation | \$150–\$300 | | TSANB permit (if required — varies by scope) | \$0–\$75 | | **Total installed** | **\$300–\$775** |

Compare that to the cost of replacing surge-damaged equipment: a heat pump control board (\$300–\$800), a refrigerator control board (\$200–\$500), or a home theatre system (\$1,000–\$5,000+). The surge protector typically pays for itself after preventing a single moderate surge event.

## Recommended Models

Look for SPDs meeting these specifications:

- **UL 1449 / CSA C22.2 No. 269** listed (required in Canada)
- **Surge current rating:** 50 kA or higher per phase
- **Clamping voltage:** 400V or lower
- **LED indicator** showing protection status
- **Audible alarm** when protection is depleted (SPDs have a finite lifespan)
- **Connected equipment warranty** from the manufacturer

Popular models used by NB electricians: Eaton CHSPT2ULTRA (\$150–\$200), Siemens FS140 (\$200–\$300), Leviton 51120-1 (\$100–\$150), Square D SDSB80111 (\$200–\$350).

## Installation

Installation takes a licensed electrician about 1–2 hours. The SPD connects to a dedicated 2-pole breaker in your panel (typically 15A or 20A). Some models mount inside the panel, others mount externally.

A TSANB permit may be required depending on how the installation is classified — ask your electrician. Many include the SPD installation as part of a panel upgrade or other permitted work.

## The Bottom Line

For \$300–\$775 installed, a whole-house surge protector is one of the best electrical investments you can make in New Brunswick. Between lightning storms, NB Power grid events, and ice storm power cycling, your electronics face real and repeated surge exposure. Combined with point-of-use protection on your most valuable devices, you'll have comprehensive surge defence.

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**Q11**

## How do I wire outdoor Christmas lights safely without overloading circuits in New Brunswick?

### Safely Wiring Outdoor Christmas Lights in New Brunswick

New Brunswick's Christmas light displays face unique challenges — heavy wet snow, ice storms, bitter cold, and Maritime wind that can turn a poorly secured light string into a sail. Beyond the weather, the most common safety issue is electrical overload — plugging too many lights into too few circuits. Here's how to do it safely.

## Understanding Your Circuit Capacity

Before plugging in a single strand, you need to know what your outdoor circuits can handle:

**Standard outdoor circuit:** 15 amps at 120 volts = **1,800 watts total capacity**

But the CEC limits continuous loads (anything running 3+ hours) to 80% of circuit capacity:

- **15-amp circuit:**  $1,800W \times 80\% = 1,440 \text{ watts available}$  for Christmas lights
- **20-amp circuit:**  $2,400W \times 80\% = 1,920 \text{ watts available}$

### LED vs. incandescent — the critical difference:

Light Type	Watts per 100-Light String	Strings per 15A Circuit	
Mini incandescent (C7)	40W	36 strings (3,600 lights)	Standard incandescent (C9)   175W   8 strings (800 lights)
LED mini	5-7W	200+ strings (20,000+ lights)	LED C9   7-10W   140+ strings (14,000+ lights)
LED icicle lights (per 10m)	8-12W	100+ sets	Inflatable decoration (each)   100-250W   5-14 inflatables
Projector light (each)	10-15W	90+ projectors	

The difference is dramatic — you'd need 200+ LED strings to overload a single 15-amp circuit, but only 8 strings of traditional C9 incandescent bulbs reach the limit. This is why **switching to LED Christmas lights is the single best safety upgrade** for your display.

## Safe Extension Cord Use

**Use ONLY outdoor-rated extension cords** marked with a "W" in the wire type designation on the cord jacket. Indoor cords lack the moisture and UV resistance needed for New Brunswick's winter conditions.

### Wire gauge by distance:

Distance	Minimum Gauge	Maximum Safe Load	
Up to 15m (50 ft)	16 AWG	13 amps (1,560W)	15-30m (50-100 ft)   14 AWG   15 amps (1,800W)
30m+ (100+ ft)	12 AWG	20 amps (2,400W)	

### Critical rules:

- **Never daisy-chain extension cords** — use one continuous cord from the outlet to the display. Each connection point is a potential failure and moisture entry point.

- **Never run cords through closed windows or doors** — the door or window frame crushes the insulation, eventually exposing conductors. Use a flat cord designed to pass under doors, or drill a properly sealed through-wall port.
- **Keep all connections elevated** — Don't let cord-to-cord connections sit on the ground where snow melt pools around them. Wrap connections in weatherproof cord covers (\$5-\$10) or at minimum, position them vertically so water drips off.
- **Never staple extension cords** — Staples can puncture insulation. Use plastic cord clips or hooks designed for temporary lighting.

## **GFCI Protection — Non-Negotiable**

All outdoor outlets in New Brunswick should already have GFCI protection (required by CEC). If yours don't, install GFCI outlets before running Christmas lights — a ground fault from wet connections in the snow is a shock and electrocution hazard.

### **Test your outdoor GFCIs before the season:**

- Press the TEST button — the outlet should go dead
- Press RESET — power should restore
- If either step fails, replace the GFCI (\$20-\$40) before connecting lights

Expect your GFCI to trip occasionally during wet weather — this is it doing its job. If it trips repeatedly, you have a moisture problem at a connection point that needs to be found and fixed.

## **Planning Your Display — Circuit Mapping**

**Step 1: Identify your outdoor circuits.** Go to your panel and identify which breakers control outdoor outlets. Turn them off one at a time and check which outlets go dead. Most New Brunswick homes have 1-3 outdoor circuits — often one in front, one in back.

**Step 2: Calculate your total load.** Add up the wattage of every light string, inflatable, projector, and decoration planned for each circuit. Stay under 1,440W per 15-amp circuit (or 1,920W per 20-amp circuit).

**Step 3: Distribute the load.** If your display exceeds one circuit's capacity, split it across multiple outdoor outlets on different circuits. Don't plug everything into one outlet with a power strip — that's a single point of overload.

**Step 4: Consider a dedicated outdoor circuit.** If your display is ambitious and your existing outdoor outlets can't handle the load, adding a dedicated 20-amp outdoor circuit costs \$300-\$600 installed by a licensed New Brunswick electrician. This is a permanent improvement that also benefits outdoor entertaining, power tools, and

future holiday seasons.

## New Brunswick Weather Precautions

**Ice storms:** New Brunswick experiences significant ice storms every winter. Ice loading on light strings adds substantial weight — a 30-metre string of C9 lights can accumulate 5-10 kg of ice. Ensure all mounting points (clips, hooks, gutter attachments) can handle ice weight without pulling loose. Falling lights can damage wiring and create shock hazards.

**Snow burial:** Ground-level displays and inflatables will be buried by snow. Inflatables have internal fans that can overheat or burn out when packed in snow. Position inflatables where snowplow and snowblower discharge won't bury them, or accept that you'll need to dig them out after storms.

**Wind:** Fundy coast and exposed locations experience sustained winter winds of 40-60 km/h with gusts exceeding 100 km/h during storms. Secure all displays and wiring against wind — loose strings whipping against siding or gutters can abrade insulation.

**Salt air:** Coastal New Brunswick locations (Saint John, Shediac, Bathurst) experience salt air corrosion. Inspect all plug connections annually and replace any showing green corrosion on the prongs.

## Timers and Smart Controls

**Outdoor mechanical timers** (\$10-\$20) are reliable and simple — set them to run lights from dusk (approximately 4:30 PM in December) to 11 PM or midnight. This saves electricity and reduces wear on the display.

**Smart outdoor plugs** (\$25-\$40) allow scheduling via app, voice control via Alexa or Google Home, and the ability to turn lights off from inside on a cold night without going outside to unplug. Make sure the smart plug is rated for outdoor use and the total connected load.

**Photocell timers** (\$15-\$25) automatically turn on at dusk and off after a set number of hours (4, 6, or 8). These adjust automatically as daylight hours change through the season.

## Common Mistakes That Cause Problems

- **Using indoor extension cords outdoors** — They crack in cold, absorb moisture, and can short circuit
- **Connecting more strings in series than rated** — Most light strings are rated for 3-5 strings connected end-to-end maximum. Exceeding this overloads the first string's wiring.
- **Leaving lights up year-round** — UV degradation from summer sun weakens insulation, and New Brunswick's freeze-thaw cycles accelerate this damage. Take displays down by March.

- **Running cords under rugs, through walls, or under carpet** — Heat buildup without ventilation is a fire hazard
- **Using damaged lights** — Inspect every string before hanging. Replace any with cracked sockets, exposed wires, broken bulbs, or damaged plugs. A \$10 light string isn't worth a house fire.

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Q12

## How do I know if my home in Fredericton needs an electrical safety inspection?

### Signs Your Fredericton Home Needs an Electrical Safety Inspection

Fredericton has a diverse housing stock — from heritage homes along Waterloo Row built in the 1800s to modern subdivisions in Hanwell and New Maryland. Regardless of your home's age, there are clear warning signs that indicate your electrical system needs a professional safety inspection. Ignoring these signs puts your family and property at risk of electrical fire, shock, and costly emergency repairs.

### Warning Signs That Demand Immediate Inspection

**Frequent breaker trips or blown fuses** — If the same breaker trips more than once a month, the circuit is either overloaded or there's a wiring fault. In older Fredericton homes, especially in the downtown and south side neighbourhoods built before 1970, circuits were designed for much lighter loads than modern households demand. A single 15-amp circuit serving an entire floor was common and is now dangerously inadequate.

**Burning smell or discoloured outlets** — A persistent burning or fishy smell near outlets, switches, or the electrical panel is a serious warning sign. Brown or black discoloration around outlet or switch plates indicates

arcing or overheating at the connection points. **This warrants an emergency call to a licensed electrician — do not wait for a scheduled inspection.**

**Tingling or mild shock when touching appliances** — Any shock sensation, even a mild tingle, when touching a metal appliance, light switch, or outlet cover indicates a grounding problem. This is especially dangerous in bathrooms and kitchens where water is present. Older Fredericton homes without grounded (3-prong) outlets are particularly susceptible.

**Flickering or dimming lights** — Occasional flicker when a large motor starts (furnace, fridge) is normal. But persistent flickering, lights that dim when you plug in an appliance, or lights that brighten unexpectedly can indicate loose connections, overloaded circuits, or even a failing neutral connection at the service entrance — a potentially dangerous condition.

**Warm or buzzing outlets and switches** — Outlets and switch plates should never feel warm to the touch (except dimmer switches, which generate some heat normally). Warmth indicates a poor connection, undersized wiring, or an overloaded circuit. Buzzing sounds from outlets suggest arcing.

## Age-Based Inspection Recommendations

**Homes built before 1950** (common in downtown Fredericton, Barker's Point):

- May still have active knob and tube wiring
- Often have 60-amp fuse panels (far below modern needs)
- Inspection priority: **Immediate** if not inspected in the last 5 years
- Expected issues: degraded wire insulation, no grounding, undersized service, amateur modifications from decades of different owners

**Homes built 1950-1975** (Skyline Acres, Lincoln Heights areas):

- May have aluminum branch circuit wiring (used from approximately 1965-1975)
- Typically 100-amp service with limited circuit capacity
- Inspection priority: **Every 5-10 years** or before any renovation
- Expected issues: aluminum wiring connections, overloaded circuits, lack of GFCI protection

**Homes built 1975-2000** (Hanwell Road corridor, Prospect Street areas):

- Copper wiring, 100-200 amp services
- May lack AFCI protection (not required until 2002 CEC)
- Inspection priority: **Every 10 years** or when adding significant electrical loads

- Expected issues: outdated panel brands (Federal Pacific and Zinsco panels are known fire risks), insufficient circuits for modern loads

### **Homes built after 2000:**

- Generally meet or exceed current code at time of construction
- Inspection priority: **Before major renovations** or if experiencing any warning signs
- Expected issues: usually minor — loose connections from settling, circuits added by previous owners without permits

## **When an Inspection Is Required**

Beyond warning signs, certain situations in New Brunswick require or strongly recommend an electrical inspection:

- **Buying or selling a home** — Home inspectors check basic electrical function but aren't electricians. A dedicated electrical inspection (\$200-\$400 in the Fredericton area) by a TSANB-licensed electrician provides a detailed assessment of the system's condition, capacity, and code compliance. This is especially important for homes over 30 years old.
- **After a flood or major water event** — The Saint John River floods regularly in the Fredericton area. Any electrical components that were submerged or exposed to standing water must be inspected before the power is restored. NB Power will not reconnect service to a flood-damaged home without a TSANB inspection certificate.
- **After a renovation or addition** — Even if the renovation didn't involve electrical work directly, changes to walls, insulation, or room layouts can affect electrical systems. TSANB requires permits and inspections for any electrical modifications.
- **Insurance requirements** — Many New Brunswick insurance companies require an electrical inspection for homes over 25-30 years old, homes with known aluminum wiring, or homes with knob and tube wiring. Your insurer may send a letter requesting an Electrical Safety Certificate — this requires a licensed electrician's inspection, not just a home inspector's checklist.

## **What a Professional Electrical Inspection Covers**

A thorough inspection by a TSANB-licensed electrician typically takes 2-4 hours for an average Fredericton home and includes:

- **Service entrance and meter base** — Condition of the weatherhead, service cable, meter base, and grounding electrode
- **Main panel** — Breaker condition, bus bar connections, proper wire sizing, signs of overheating, panel brand safety recalls
- **Branch circuit testing** — Voltage readings, ground fault testing, circuit loading analysis
- **Outlet and switch testing** — Ground continuity, polarity verification, GFCI function testing
- **Visible wiring inspection** — Accessible wiring in basement, attic, and utility areas checked for damage, improper splices, and code violations
- **Smoke and CO detector verification** — Proper placement and function

### Cost of Inspection in the Fredericton Area

- **Basic safety inspection** (visual + testing, 1-2 hours): \$150-\$250
- **Comprehensive inspection with report** (2-4 hours, written findings): \$250-\$400
- **Insurance-required Electrical Safety Certificate:** \$200-\$350
- **Pre-purchase inspection** (buyer-focused, includes capacity assessment): \$250-\$400

Most Fredericton electricians can schedule an inspection within 1-2 weeks. If you're experiencing active warning signs (burning smell, sparking, shocks), call for same-day or next-day emergency service — most local electricians offer priority scheduling for safety concerns.

### What to Do With the Results

After the inspection, you'll receive a list of findings categorized by severity. Address **safety hazards** (exposed wires, missing grounds, overloaded circuits) immediately. **Code deficiencies** should be corrected before your next insurance renewal or home sale. **Recommendations** (upgrades, additional circuits) can be planned and budgeted over time.

Keep the inspection report on file — it's valuable documentation for insurance claims, home sales, and planning future electrical work.

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## Why does my GFCI outlet keep tripping in my bathroom every morning?

### Why Your Bathroom GFCI Outlet Trips Every Morning

A GFCI (Ground Fault Circuit Interrupter) outlet that trips repeatedly — especially at the same time each morning — is doing exactly what it's designed to do: detecting a ground fault and cutting power to prevent electrocution. But the fact that it keeps happening means there's an underlying issue that needs to be identified and fixed. This is a common complaint from New Brunswick homeowners, and the cause is often moisture-related, especially during our cold, damp Maritime winters.

### How GFCI Outlets Work

A GFCI continuously monitors the current flowing through the hot and neutral wires. If it detects a difference of more than **4-6 milliamps** — meaning current is leaking to ground through an unintended path (like through water, or through a person) — it trips in **1/40th of a second**. That tiny current difference is enough to cause a dangerous shock, so the GFCI shuts down the circuit.

### Most Common Causes of Morning Trips

#### 1. Moisture and condensation (most likely in New Brunswick)

This is the #1 cause of recurring GFCI trips in Maritime bathrooms. Here's what happens:

- Overnight, bathroom temperatures drop (especially if you lower the thermostat or have poor insulation)
- Warm moist air from the previous evening's showers condenses on cold surfaces — including inside the electrical box behind the GFCI outlet
- By morning, enough moisture has accumulated to create a tiny ground fault path
- When you turn on a connected appliance or light, the GFCI detects the leakage and trips

This is especially common in:

- Older New Brunswick homes with poor bathroom ventilation (no exhaust fan, or a fan that vents into the attic instead of outside)
- Bathrooms on exterior walls in Moncton, Fredericton, and Saint John homes where the wall cavity gets cold enough for condensation
- Basement bathrooms where humidity levels are naturally higher

**Fix:** Improve ventilation — run the bathroom exhaust fan for 20-30 minutes after showers (a timer switch costs \$25-\$40 and automatically handles this). Ensure the fan actually vents to the outside, not into the attic. Check that the GFCI outlet box is properly sealed and insulated on exterior walls.

## 2. A connected appliance with a ground fault

In many New Brunswick homes, a single GFCI outlet protects multiple downstream outlets in the bathroom (and sometimes in adjacent rooms). The trip may not be caused by the GFCI outlet itself, but by an appliance plugged into a downstream outlet:

- **Hair dryers** with damaged cords or internal insulation breakdown
- **Electric space heaters** (commonly used in poorly heated New Brunswick bathrooms) with worn elements
- **Electric toothbrush chargers** or shavers with moisture-damaged bases
- **Night lights** with cracked housings

**Fix:** Unplug everything on the GFCI-protected circuit. Reset the GFCI. Plug items back in one at a time over several mornings to identify the culprit. Replace the faulty appliance.

## 3. Deteriorating GFCI outlet

GFCI outlets have a lifespan of **10-15 years**. As the internal sensing components age, they become more sensitive and prone to nuisance tripping. If your bathroom GFCI is original to the home and the house was built before 2010, the outlet itself may be the problem.

**Fix:** Replace the GFCI outlet (\$20-\$40 for the device, \$100-\$200 for professional installation). This is one of the most cost-effective electrical upgrades for any New Brunswick home.

## 4. Wiring issues behind the outlet

In older homes across New Brunswick, several wiring conditions can cause GFCI trips:

- **Shared neutral wires** — If two circuits share a neutral wire (a multi-wire branch circuit or "shared neutral"), the GFCI sees an imbalance and trips. This was a common wiring practice in homes built from the 1960s through the 1980s.
- **Damaged wire insulation** — Rodent damage, nail punctures from renovations, or degraded insulation in older homes can create intermittent ground faults that worsen with moisture.
- **Loose connections** — Wire connections inside the electrical box that have loosened over time can create intermittent faults, especially as temperature changes cause metal expansion and contraction.

**Fix:** These require a licensed TSANB-certified electrician to diagnose and repair. Cost: \$150-\$400 depending on the issue.

## 5. Outdoor factors entering the circuit

Sometimes the bathroom GFCI protects outdoor outlets as well (downstream protection). Ground moisture, rain, or snow melt reaching an outdoor outlet or junction box can trip the bathroom GFCI. This is common in New Brunswick during spring thaw and heavy rain events.

**Fix:** Check if the bathroom GFCI is protecting outdoor outlets (trip the GFCI and see what else loses power). If outdoor outlets are on the circuit, they need their own weather-rated GFCI outlet with an in-use cover, separate from the bathroom circuit.

## Diagnosing the Problem

**Step 1:** Press the RESET button on the GFCI. If it won't reset at all, the fault is active right now — something plugged in has a ground fault, or the GFCI itself has failed.

**Step 2:** Unplug everything on the circuit. Reset. If it stays on, plug items back in one at a time.

**Step 3:** If it trips with nothing plugged in, the issue is in the wiring — moisture in the box, damaged cable, or a failing GFCI device.

**Step 4:** Test the GFCI using the built-in TEST button monthly. Press TEST — it should trip immediately. Press RESET — it should restore power. If either function fails, replace the GFCI immediately.

## When to Call an Electrician

Call a licensed New Brunswick electrician if:

- The GFCI won't reset at all (active fault in the wiring)
- The GFCI trips instantly every time you reset it with nothing plugged in
- You notice sparking, burning smell, or discolouration
- You've replaced the GFCI and the new one also trips
- The tripping started after a renovation, flood, or roof leak

A diagnostic visit from a TSANB-licensed electrician in the Moncton, Saint John, or Fredericton area typically costs \$100-\$200 and usually identifies the root cause within an hour. Given that GFCI protection is literally a life-saving device — preventing approximately 300 electrocution deaths per year across North America — getting it working correctly is not something to delay.

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Q14

## What causes a burning smell from an electrical outlet and is it an emergency?

### Burning Smell From an Electrical Outlet — Causes and Emergency Response

A burning smell coming from an electrical outlet is always serious and should never be ignored. In New Brunswick, electrical fires account for a significant percentage of residential fires each year, and many start behind walls where overheating connections smolder for hours or days before igniting. If you smell burning plastic, rubber, or a hot metallic odor near an outlet, treat it as an urgent safety concern.

#### Immediate Steps to Take

- **Unplug everything** from the outlet immediately. Do not touch the outlet plate if it feels hot — use a wooden or plastic object to flip the plug out if needed.
- **Turn off the breaker** for that circuit at your electrical panel. If you are not sure which breaker controls the outlet, turn off the main breaker.
- **Check for visible damage** — Look for scorch marks, melted plastic, discoloration on the outlet cover, or smoke coming from the wall.
- **If you see flames or smoke from the wall**, call 911 immediately. Do not attempt to put out an electrical fire with water. Use a Class C or ABC rated fire extinguisher if you have one.
- **Do not restore power** to that circuit until a TSANB licensed electrician has inspected and repaired the issue.

#### Common Causes of Burning Smells

**Loose wire connections** — This is the number one cause. Over time, the screw terminals on outlets loosen from thermal expansion cycles. New Brunswick homes experience extreme temperature swings — from -25°C in January to +30°C in August — which accelerates this loosening. A loose wire creates a high-resistance connection that generates heat, eventually melting the wire insulation and outlet plastic. Cost to repair: \$100-\$200 for an electrician to re-terminate connections.

**Overloaded circuit** — Plugging too many devices into one circuit causes the wiring to heat up. This is especially common in older New Brunswick homes with only 8-10 circuits total, where residents run space heaters, dehumidifiers, and window air conditioners on the same circuit. A standard 15A circuit can safely deliver about 1,440 watts continuous. A single 1,500W space heater uses nearly all of that capacity. If you smell burning during heavy usage, the circuit is overloaded. Solution: have an electrician add a dedicated circuit (\$250-\$500).

**Damaged or deteriorated wiring** — Homes built before 1970 in Saint John, Fredericton, and Moncton may have wiring with insulation that has become brittle and cracked over 50+ years. Rodent damage is also common in rural New Brunswick, particularly in older farmhouses and homes near wooded areas. Mice chewing through wire insulation creates exposed conductors that arc against framing or other wires. Rewiring affected areas costs \$300-\$1,500 depending on accessibility.

**Backstab connections** — Many outlets installed from the 1970s through 1990s used push-in "backstab" connections instead of screw terminals. These connections are notorious for loosening over time and are the single most common cause of outlet fires. If your home was built during this period, it is worth having an electrician check for backstab connections during any service call. Changing to screw-terminal connections costs \$5-\$10 per outlet in parts, plus \$75-\$150 per hour in labour.

**Faulty or recalled outlet** — Some outlet brands have been subject to recalls. If the outlet itself is defective (internal contacts worn or undersized), it can generate heat even with normal loads.

### How to Prevent This

- Have a licensed electrician inspect outlets in any home over 25 years old, especially if you notice outlets that are warm to the touch, intermittently lose power, or show discoloration
- Never use extension cords as permanent wiring — this is a CEC violation and a common fire cause
- Install tamper-resistant outlets (required by current NB code in all new construction) which also tend to have better internal contact quality
- Consider an arc-fault circuit interrupter (AFCI) breaker for bedroom circuits — these detect arcing from loose connections and shut the circuit off before a fire starts. AFCI breakers cost \$40-\$60 each and are required by the current Canadian Electrical Code for bedroom circuits in new construction

### When It Is a True Emergency

Call 911 if you see any of these: visible flames, smoke from the wall or ceiling, sparking from the outlet, the outlet or wall is hot to the touch, or you hear crackling or buzzing sounds behind the wall. New Brunswick fire departments respond to electrical emergencies and can use thermal imaging to check for heat inside walls. Do not attempt to investigate inside the wall yourself — cutting into drywall near an active electrical fault is extremely dangerous.

### Getting It Fixed

After the immediate danger is addressed, call a TSANB licensed electrician. Most electricians in Moncton, Saint John, and Fredericton offer same-day emergency service for electrical safety issues, typically at rates of \$125-\$200 per hour. The repair itself is usually straightforward — replacing the outlet, re-terminating connections, and inspecting adjacent outlets on the same circuit. Budget \$150-\$400 for a typical repair.

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Q15

## What is the difference between AFCI and GFCI breakers and where do I need them in my home?

**GFCI breakers protect you from electrocution by detecting current leaks to ground, while AFCI breakers protect your home from fire by detecting dangerous electrical arcs in the wiring.** Both are required by the Canadian Electrical Code in specific locations, and newer homes in New Brunswick should have both types installed.

Think of it this way: **GFCI protects people, AFCI protects property.** A GFCI (Ground Fault Circuit Interrupter) monitors the current flowing out on the hot wire and returning on the neutral wire. If even 5 milliamps goes

somewhere it shouldn't — like through your body to ground — the GFCI trips in about 1/40th of a second. Without GFCI protection, that same current could cause electrocution. An AFCI (Arc Fault Circuit Interrupter) monitors the electrical waveform for signatures of dangerous arcing — the kind that happens when a wire is damaged, a nail pierces a cable, or a connection deteriorates inside a wall. These arcs generate intense heat that can ignite wood framing and insulation.

**Where GFCI protection is required in New Brunswick (CEC rules):**

- All bathroom outlets (every outlet, not just near the sink)
- Kitchen countertop outlets (within 1.5m of the sink)
- All outdoor outlets
- Garage outlets
- Unfinished basement outlets
- Laundry room outlets near sinks
- Hot tub and pool equipment circuits
- Any outlet within 1.5 metres of a water source

**Where AFCI protection is required (current CEC as adopted in NB):**

- All bedroom circuits (outlets and lighting)
- Living rooms and family rooms
- Dining rooms
- Hallways
- Closets
- Sunrooms

Essentially, AFCI is required in all dwelling areas where people sleep or spend extended time, while GFCI is required everywhere water is present.

**The cost difference.** A standard breaker costs \$8 to \$15. A GFCI breaker costs \$40 to \$80. An AFCI breaker costs \$40 to \$60. A dual-function AFCI/GFCI breaker costs \$50 to \$90. For new construction or a major renovation in New Brunswick, your electrician will spec the appropriate breakers for each circuit — this is not optional, it's code.

**Common issues in older New Brunswick homes.** Many homes built before 2002 have no AFCI protection at all, and homes built before the 1980s may lack GFCI in locations where it's now required. When you renovate a room, TSANB requires the electrical work to meet current code — so a bathroom renovation means upgrading

to GFCI, and a bedroom renovation means adding AFCI protection. This is one reason electrical costs on renovations can be higher than homeowners expect.

**Nuisance tripping.** AFCI breakers are sometimes prone to tripping from certain appliances — vacuums with brush motors, treadmills, and some older power tools can create waveforms that mimic arc faults. If your AFCI breaker trips repeatedly, don't just replace it with a standard breaker (that's a code violation). Instead, have your electrician investigate — it might be a legitimate wiring issue, or you may need a newer-generation AFCI breaker that better distinguishes real arcs from motor noise.

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