# CALCULATING PROSPECTIVE FAULT CURRENT, AND WHAT MAKES IT FALL LATER

**FOUR SPOTLIGHTS BECAME EIGHT. WHAT CHANGED?**

### USING THE $Z_S$ FROM THE VOLT DROP EXAMPLE

Lowest fault current — for checking disconnection:

$I = (U_o \times C_{min}) \div Z_s$

$= (230 \times 0.95) \div 0.98$

$= 218.5 \div 0.98$

$= 222.96\ A = 0.223\ kA$

**For breaking capacity, measure the maximum.**

A device sees its highest fault current at its own terminals, where the impedance is lowest.

**Guidance Note 3**

· 2.6.16 · pp.88–89 has you measure the maximum prospective fault current, record the **greater of PSCC and PEFC**, and check it is below the device's breaking capacity. The calculation above gives the minimum, not the maximum.

**Record it to three decimal places**

unless told otherwise — that is what the instrument gives you.

**Where $C_{min}$ comes from.**

It is the **minimum voltage factor**, to take account of voltage variations.

**BS 7671**

· Reg 411.4.4 · p.73 defines it, and its Note 1 gives **0.95** for low-voltage supplies under the ESQCR. It is not tied to conductor size.

Now the question worth understanding: what makes the fault current **lower** later on?

### WORK IT FROM OHM'S LAW

$I = U \div R$ — and R can be swapped for Z

So for the current to **fall**, the impedance must **rise**.

| WHAT RAISES $Z_S$ AFTER YOU LEAVE | |
|---|---|
| **Temperature** | The cable is in use now and the copper is warm |
| **Length** | The client extends the circuit — more sockets, a spur, an extension |
| Dry ground, on a TT system | The electrode reading drifts up |

**The example that makes it land.**

Four spotlights in a kitchen when you certify it. You are called back five years later for a periodic and there are eight. Nobody added a circuit — they just added cable. More length, more resistance, less fault current than you recorded.

**$U_o$ is not the variable.**

230 V is nominal and only moves within the supply tolerances — the +10% / −6% table at the end of

**BS 7671**

· Appendix 2 · p.436 .

---

Free section from Sparky Study Notes. The full Level 3 notes, 1,463 practice questions and the video lessons: sparkystudynotes.co.uk