The 5 root causes of compliance delays in industrial electronics.

How to spot them in your own process — long before the lab. Here are the five most common patterns, each with the early signal that would have made it visible at schematic review.

01 ErP standby that fails the test

WHAT HAPPENS

The product passes its lab test at full load — full load was the regulation everyone focused on. Standby and sleep modes are approved without a careful review. Then the official lab measures consumption in standby and the value is outside the limit.

SIGNAL AT SCHEMATIC REVIEW

The standby calculation is done at schematic review with the actual selected components, not with typical datasheet numbers. The discrepancy appears on a whiteboard, not in a lab.

02 EMC margins too tight

WHAT HAPPENS

The prototype passes pre-test by a small margin and the team continues. The official lab adds variations — temperature swings, supply voltage changes, a different chamber — and the margin disappears. The prototype fails.

SIGNAL AT SCHEMATIC REVIEW

Pre-test passing with margin to absorb real-world variation is the real criterion. A schematic review that records, in writing, how much margin is enough prevents the surprise.

03 Components without target-market certification

WHAT HAPPENS

A part is qualified in Europe and the design is closed. Then the US team asks for the same product to be certified for their market. The team discovers that the component — already in production — has no UL listing. The discovery comes after the project is finished. Months are lost.

SIGNAL AT SCHEMATIC REVIEW

A routine BOM review at schematic stage cross-references every critical component against every target market — not just the closest one. A 30-minute exercise that prevents a 4-month redesign.

FIVE PATTERNS

The last two — and the common thread

04 UL paperwork arriving incomplete

WHAT HAPPENS

The technical file is closed for Europe and the team assumes it will work for the US by changing only the notified body. UL asks for documentation the European lab never required, and the discovery comes when the project is already in the US.

SIGNAL AT SCHEMATIC REVIEW

The technical file plan considers the target markets from day one. What UL requires is on the supplier's deliverables list from the first prototype shipment, not asked for later.

05 Silent component changes from the supplier

WHAT HAPPENS

The supplier replaces a component in your BOM without notice. You discover the change when a routine quality test produces different results — or worse, when an audit shows the file describes one part and the product carries another.

SIGNAL AT SCHEMATIC REVIEW

The supplier agreement defines what changes need notification, what documentation arrives with each, and how regulatory impact is evaluated — before substitution, not after.

THE COMMON THREAD

Every pattern was visible at schematic review.

All of them become expensive at the lab. The difference between a partner who builds what you give them and one who reviews it before building appears in qualification time, certification cost and time-to-market — every single project.

keld@keld.es
Polígono Empresarium, C/Lentisco, 15, 50720
La Cartuja Baja - Zaragoza, Spain
+34 976 42 90 99
www.keld.es