Policy Vs. Engineering: The Brawl For Common Sense In Design

by CV Ferro

Scene 1: Design review sometime in the early 2000s for a large aircraft-control-surface actuator array. One junior engineer asks the question "Hey boss, how many nerve endings does a pigeon have on the leading edge of its wing?" The boss, bothered by the paltry mortal's curiosity barks back, "I dunno, maybe a million".

The junior engineer then asks "Well then how come we only have two sensors in the wings and we only actually use one?" Some years later, the sensors fail and a few planes crash. Shareholders dismiss the body count as collateral. The loved ones are told of corporate policy on the recorded, simplex conference call from legal.

Scene 2: Structural inspection of a large condominium building in the south. The first inspector notes major structural deficiencies. Takes pictures, runs calculations. Report title reads to the effect of "This structure endangers life and property, it must be red flagged, evacuated and repaired immediately".

The suits from corporate didn't really want to read the report. It's easier just to nod and think about lunch. They are troubled by the title. A couple of emails and a few seconds later, the offshore call center texts the inspector of his immediate termination.

The next inspector comes in with no credentials or experience. "The structure is in great shape" reads his report. This is in line with corporate austerity metrics. This is what the suits wanted to hear. A few days later, the structure falls over, hundreds killed. The loved ones are told of corporate policy on the recorded simplex conference call from legal.

Scene 3: Motor and control system design for electric aircraft. The inverter is showing VHF oscillations on the gate terminals of the power transistors. All know that this gate oscillation will radiate, conduct, couple and cause premature failures in the circuit and the system.

But the deadline is slipping. Management sees the pipeline shrinking and the funnel cross section decreasing if the project is late. "Do you think anyone will notice?" is the question from the most senior engineer in the room at the peer review. Anyone that says yes is ignored. We all know how this ends.

All three scenes are fictional of course but they depict an existing mentality in business today and its potential dangers. They were dominated by austerity metrics and ended in tragedy under the untiring grapples of corporate policy. Obvious failures and problems were overlooked for the almighty payola in a land where common sense is a distant memory and engineering takes second or third chair to funnels, pipelines and accounting.

In the non-fictional world, I have been involved with many designs where we were told to cut corners, dummy it down, cheap it up and make the deadlines. I never gave in. In the peer reviews, at the eleventh hour when the CEO popped in to threaten everyone, I stayed the course.

"No, I will not design and release to production an inferior insulation, grounding and bonding system on UL, CE, DO, MIL, NFPA, or NEC guidelines to make your shipping date. That will endanger people and property and I'm not doing it". The CEO gets snotty, like an angry baby, storms out of the room with perhaps a door slam and some expletives. Every time I've waited for the "you're fired," it never came.

Oddly, my clients always anticipated a couple of design hiccups and planned on a later shipment and everything usually commissioned on time. But when I stand up, I'm alone. Everyone else would rather cower and deliver low-grade, dangerous junk than buck the system. "Don't make a scene, go along with it!". I've had lectures from peers on corporate policy taking precedence over safety agencies and electrical codes.

To compound this, most any ask in the corporate world ends with a response to the effect of "Well, we have a strict policy on that policy and thereby we can't, won't, don't…….". This isn't the right answer to anything, but it's the easiest answer to everything. If one can duck behind policy, then they don't have to engage the person asking the question or the issue at hand.

How then to escalate? How then to stand up? Should we all windsock and allow garbage? Where and how does the truth fit into the policy?

Maybe safety agency approval takes too long and we develop a policy that skips the effort? FMECA? EMI? Stability? Bah humbug!

Perhaps bolts, welds and rivets will become too expensive and too complicated under corporate policy and we'll transition to kinder, gentler duct tape or bubble gum for structural matters under a policy that tells us that's ok? Maybe the board will find the words "transit level" to be offensive and decide that a crooked structure is OK?

In times where ad hoc policy seems to take precedence over common sense, safety, laws, life, property or sound engineering, what is YOUR policy and how do you execute it?

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