silverbullets

Craig Silver

Floaters, Flutter, and Failure

As a kid, my neighborhood pals and I would love to race go-carts or mini bikes, and, in one case, we used a three-wheeled mail delivery truck (with body removed). We would remove the engine governor springs on these vehicles because we thought that the purpose of the governor was to limit fun rather than engine rpm.

It was a little scary to see what happened to a mini-bike engine when the engine blew while a "competitor" was splayed right on top of the thing. Older boys explained that if the engine "over revved," the valves would not be opening and closing, but just "floating" in a state where they never seated closed. The resulting explosion was the fuel being lit off when the valves were open. Apparently, the valves were doing no real work even though a lot of activity was going on.

Something similar happens in airplane appendages. Similar to floating valves, the unbalanced or flexible ailerons of an airplane can flutter and engage in a resonant "buzz" where they no longer act as a controlling surface of a wing but just vibrate themselves to destruction.

I believe engineering teams can also find themselves "floating" or "buzzing" to the point where no real work is being accomplished. This phenomenon can be caused by the sales or marketing group driving the engineering teams. Typically, the scenario goes like this. The VP of marketing needs to show that he is on top of things and so he proposes that the company come out with five new products next year. The administrators, budget analysts, and others will plan for the requisite number of employees and allocation of resources to meet the VP's goals.

What happens next is important. In addition to the five new products, it turns out that some reengineering is

> **I believe engineering teams can also find themselves "floating" or "buzzing" to the point where no real work is being accomplished.**

needed for three of last year's products. Then, their biggest customer needs a certain feature added to one of the existing products. Next, the sales group gets wind of a great opportunity in Madagascar that is "just what we already sell" except they need engineering to combine this year's widget with last year's widget with a slight modification to meet specs.

The effect of all this is to wake up one day and find that instead of the engineering team doing five projects, they instead have been slated for ten. Once this is discovered, the VP and others will gather to find out "how long will it take" to do all ten projects. What can be observed is that the time estimate given will almost certainly be wrong—way wrong.

The reason for this is that engineering teams can "flutter" too. If too many projects are added, what tends to happen is that so much effort is required to go from one project to the other or given to rescheduling and reprioritizing the efforts that in the end very little work is really going on. The result usually is that none of the ten projects is accomplished and the company, as a whole, is worse off than if none of the newest five projects had been proposed. Moral is usually sent to the bottom of the scale as recriminations and finger pointing waxes strong.

"Taking it to the next level" can either be a helpful buzz word or it can cause people to "buzz" and, like taking off the governor on an engine or experiencing an unbalanced aileron on an airplane, can cause catastrophic losses.

Craig Silver (craig@patton.com) is vice president of the Open Systems Group for Patton Electronics Inc., a manufacturer of telecommunication equipment. Prior to his current position, he spent five years in general management of a digital signal processing company and 15 years in general law practice advising high technology ventures.

**IEEE Instrumentation & Measurement Magazine**

June 2004