

Re: quality control

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- *From:* Richard Ulrich <Rich.Ulrich@xxxxxxxxxxxx>
 - *Date:* Tue, 14 Nov 2006 01:28:41 -0500
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On Mon, 13 Nov 2006 10:04:03 -0600, David Winsemius
<doe_snot@xxxxxxxxxxxx> wrote:

Richard Ulrich <Rich.Ulrich@xxxxxxxxxxxx> wrote in
news:vnsfl2d685snrulj63m9iel784mhgnjop8@xxxxxxxx:

On 12 Nov 2006 17:00:04 -0800, "Frank" <deps_bear@xxxxxxxx> wrote:

If I know a product fails .01% of the time and I have 1500 items I'm running through a process. How many items do I need to check with, say, 99% confidence that all the items are built correctly.

How many failures do you expect? Almost always, zero. This is dealing with exact probabilities. For a higher failure rate, you might want to look at the p of success, and raise to a power, e.g., $(.9999)^n$. For the tiny p of 0.01%, the figuring can be pretty much additive

You want to have only so many items *unchecked* that there will be, on the average, only 1 bad item in 100 samplings — so that 99 times out 100, there will be none.

You expect 1 failure in 10,000. One hundred samplings that each fail to test 100 items will meet that condition. So you need to check 1400 of each 1500.

How did you go from 100 samplings of size 100 to the number 1400?

What I got was 100 samplings of 100, with a long-term average of 1 defect per 10,000. The 1500 and subsequently 1400 are largely irrelevant to the problem, as I construed it. I agree that

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it is not necessarily a good way to devise a real-life test of defects. As you point out, it is even more difficult to assure that there are *no* defects, than what you get with this strong assumption. Basically, you might as well go with 100% testing.

If the long term rate is 1 per 10,000, then any sample of 100 has a (very close to) 99% chance of being clean. That's easy arithmetic, following stern logic.

However you did it, you are then claiming that after examining 1400 items that you are 99% confident that there are no defective items in the remaining 100 items, when the past experience indicated that the failure rate was

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