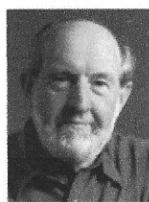


## FINAL WORD

# Doing It by the Numbers

Malcolm Ridgway and Alan Lipschultz

### About the Authors



Malcolm Ridgway, PhD, CCE, is a retired chief clinical engineer.



Alan Lipschultz, CCE, PE, CSP, is president and CEO of HealthCare Technology Consulting LLC.

When our clinical colleagues ask, "How do I know that all of my equipment is safe to use on my patients" and we answer, "Well, all of our PMs are always done on time," that's really not the best response. Wouldn't it be more reassuring if our response was more like the following?

*"Well, there are some pieces of equipment, like the knee exerciser over there, that are not very complicated and which couldn't possibly injure a patient, even if they failed completely. Such items are classified as noncritical, and they only need very simple maintenance to keep them functional. A lot of the equipment in the hospital's inventory falls into this noncritical category.*

*"There are some other items, such as this critical care ventilator and this transport incubator, that are critical in the sense that if they fail completely, a patient could be injured. These kinds of devices are classified as reliability-critical, and we take a number of steps to reduce the possibility of them failing. These kinds of device are designed to be very reliable. For devices in this category, we follow all of the manufacturer's recommendations for preventive maintenance and we carefully analyze every failure. We also monitor the statistics from our national database to confirm that each make and model has an average or mean time between failures (MTBF) that is within an acceptable range.*

*"We have some other types of devices, such as this patient monitoring system and this infant incubator, which, in theory, can cause patient injury if they fail in such a way that they are either providing substantially inaccurate information or they have degraded to the point that they no longer meet safety specifications. All of the ways that these kinds of devices, which we classify as performance/safety-critical devices,*

*could fail have been identified as potentially critical failures. These kinds of failures are called 'hidden' failures because they are usually discovered by performing some kind of periodic performance verification or safety testing, although sometimes these performance/safety-critical devices are designed to warn the operator of any hidden failures. We have been collecting and aggregating the results of these performance and safety tests in our nationwide database, and we have confirmed that each make and model that we have develops potentially critical failures very, very infrequently. Our database shows that these kinds of hidden failures occur, on the average, less than once every 500 years."*

The suggested answer above is, of course, meant only to illustrate the principle, and the specifics would vary. The key here is that the answer would hinge on actual test data.

If you agree that this is the kind of response that we should provide, then you are invited to join us in exploring how we could assemble such a database.

You can do this by visiting [HTMcommunityDB.org](http://HTMcommunityDB.org). After clicking the "here" link on the opening page, you will be able to see the main page. This is a password protected wiki-type website so follow the instructions at the top of the main page to gain read-only access. When asked to log in, use "view" as your username and "view" as your password. Do not attempt to create an account.

After you have reviewed the initial material, which is completely tentative at this point, e-mail your comments on the concept of the project and on the preliminary material to the address for the initial Task Force, which is [htmc.mptf@gmail.com](mailto:htmc.mptf@gmail.com). ■

