

Get Reliability and Availability in Writing

If buyers do not ask about expected performance in terms they can understand, they may not get full value from their equipment purchase.

You have agreed to pay lakhs for your latest plant upgrade. The vendor built, delivered and installed the equipment, then ran a functional test to make sure that it did what was promised. It works, Satisfied?

The equipment may be working, but how often might it fail? Those are key questions that any purchaser of capital equipment should ask every vendor. In fact you need to consider making clear statement of system reliability and repair part of your purchasing agreement.

Contracts often define that before a deal is finalized, the system must pass some sort of acceptance test. However, in such tests, the vendor and the customer share risks. The vendor's risk is that a "good" system fails the test and the customer rejects it. The customer's risk is that a "bad" system happens to pass the test. As such, tests need to be signed to balance these two risks so both parties agree and know what they are getting. If neither is willing to take much risk, then the test will have to be run for a long period of time to determine the long-run reliability of the equipment.

Failure isn't always bad

Acceptance tests are particularly difficult to run when equipment is highly reliable, as good converting equipment tends to be. You need failure data, get good statistically valid estimates of reliability and availability. In addition, failures offer you an opportunity to observe repair times. Until you get a few failures, you have very little information upon which to base any long-term estimates of meantime to repair.

It is also important for you to distinguish the very different concepts of reliability and availability. Reliability is the probability of failure over a stated period of time a system is up and running, so it necessarily considers the time it takes to repair a failed system.

You could have a system that fails frequently, but if it only takes one second to get back up and running; you have a highly available system. That could be good, as opposed to a system that's very reliable, but when it breaks down it stays down for months because you have to fly in the parts from China or elsewhere.

Note that reliability is generally a function of the system design, whereas repair time is a function of the design of your

design process, on-site technical support, spare parts availability, and training.

What to ask for

Contract documents between vendor and customer should provide a clearly defined procedure for any acceptance test many contracts simply state that a 40-hour test will be run and that the vendor must repair the problems found during the test.

Without a clear "rejection" and complete retest of failing equipment, there can be no accurate statement made about the long-term behaviour. Suppliers could simply make minor adjustments to temporarily fix the equipment without ever statistically demonstrating long-term reliability or availability.

Contract document should clearly state or define the repair process to be used during the test.

This would for example, prevent the vendor from setting up a specialized repair process, such as having extra repairmen, spare parts, etc., to keep the repair times low only during the test. In that case the test results would not be indicative of the actual repair times experienced by the consumer.

Documents should also clearly state the type of loads to be used during the test. Vendors may want to run the equipment under reduced loads to decrease the probability of failure during test. Again this will bias results and not represent the actual rate of failure, the buyer will experience later.

Forty hour reliability tests are fine, but from a statistical view point you will learn very little about the long-term failure and repair rates for the equipment. Remember, it is not difficult for a bad machine to run forty hours without failure. Performance is more than just specifications and linear feet per minute. Those are important, but if the equipment fails more than it should, or takes too long to repair, that could be more critical to overall success.

Vendors and consumers must develop long term relationships in tackling these issues. Reliability and availability tests are important and must be clearly defined in your next project specification. There are good resources to help you out there to help you learn more about the subject and ensure that you and the vendor install the best equipment possible.

(Source: Purchasing Guide 2006 brought out by Paperboard Packaging)