

TMAG Test Economics Committee
Minutes – Meeting of 21 January 2010
Minutes by Scott Davidson

Attendees:

Scott Davidson
Thomas Neal
Ron Press
Louis Ungar

Thomas brought up the problem of convincing people that quality is worth the addition of testability, when there are no metrics available to demonstrate the value of testability clearly.

We don't know fail instances and their consequences in the field very well. Faults can be very intermittent.

Is this fault permanent or transient? If permanent, a good test should catch it. But Thomas said that in fault tolerant systems some managers think that failing and then repairing on first fail is overkill, since the system is designed to handle this case.

How do we get to cost/benefit analysis without adequate information?

Thomas volunteered to put together a spreadsheet to assess the priorities of which faults to pursue. He has some information on field fault spectrum. They have a lot of workarounds in firmware.

Louis finished his class at Picatinny Arsenal. The example used was a howitzer and its control, including the sensors. The system consisted of LRUs (boxes) all of which had built-in self test. They could provide good isolation to LRU boxes. Ambiguity was between the cable and the box. In the class they defined the cable as the LRU. The question came up about how cables were being tested. The cable not being screwed on properly was not a failure mode which was tested for. The cable coming loose was the biggest problem in the field, but this failure mode doesn't appear in any engineering analysis.

Scott noted that a JTAG variant looks for this, and that old telephone switches tested for this, since it was an issue during installation.

Thomas's boards have BIST also.

Were the built-in test on LRUs available at system level? Scott thought so, because there are no NFF conditions inside the LRUs – the cables and interfaces.

Logistics people built a fault isolation requirement based on the number of spares that would be available. Isolating to multiple units requires more spares. This is the economic factor most important to them, but it is not clear how to break this down into dollars directly.

The person in Picatinny is willing to talk to us, but doesn't see the benefit to him, since they aren't driven by economic justification. Scott suggested that he tell us what they did right, and that we don't cast it as us helping him. BIST was not part of the requirement – but got included anyway. We'd like to understand why.

Tom Maiello is the manager there.

We then discussed penalty costs, the cost of a field failure. Scott said that his customers tell Sun how much it costs them when a system goes down, and that there are documented field fail costs. But some things, like the CEO having to apologize to a customer, and having to run 7 am calls on a quality problem, aren't quantifiable.

Scott and Louis will try to do a model for penalty costs. Thomas will look for the reference to the 10X incremental cost at each test stage, which he thinks was in a paper by Teradyne in the 1970 Cherry Hill Test Workshop. While this has passed into the status of folklore, Scott has data showing that it is fairly accurate.

Louis thinks the COTS makers had BIST, but why? Did other customers require it? Was it an internal focus for them? Maybe we can ask them.

AI: Louis – Invite Tom Maiello to the next meeting.

We still need candidate systems for analysis.