

TMAG Test Economics Subcommittee  
Minutes – January 7, 2010 Meeting

Minutes by Scott Davidson

Attendees

Tony Ambler  
CJ Clark  
Scott Davidson  
Gordon Eckhard  
Bill Gerstein  
Thomas Neal  
Russell Shannon  
Louis Ungar

Discussion: Selection of test process for analysis

Scott: The email discussion seemed to indicate that people wanted to do field service. How can we narrow this down to something more feasible?

Russell: Which vehicle should we study of several available – or should it even be a vehicle, or rather something like a rocket launcher?

Louis: He is doing a class on test and he thinks that he could offer our services to help in analyzing a system which is a problem for his students. It seems that information on systems at this location is not confidential.

Scott: It is more important to select something with good information available rather than the system which offers the best absolute return.

It was suggested that it would be good to select a program where some analysis was done already. Trident 2 might be a good example, with a lot of data.

<Bay Area residents took a break for an earthquake here>

Scott suggested that we list items we need to know about the target system. Some suggested are:

Maintenance flow  
Field fail rates  
Costs

Louis asked if we get designers involved to provide more information. The consensus was that the particular designer was not likely to be available, but the organization that did the design would likely have important background information.

One thing not likely to be available is any measure of test coverage. In the Army, there is seldom money to do good fault insertion. The Navy is the same. This does not mean that coverage is not considered

important, just that given the size of the problem other things can take priority.

What level should we be considering? We agreed that if we are talking about field service, the box level makes the most sense.

We then had a long discussion about the level of isolation. The best granularity would follow that of the various services. LRU (Army terminology) – anything that can be replaced in the field. The Navy has another name. Shop Replaceable Assemblies are different, referring to components replaced in a repair depot.

Are cables LRUs? In the Navy, it is a bit vague if fault isolation units include cables – they are interconnect media, a component requiring detection and isolation.

How important are cables. Louis would like to see near 100% coverage, to make sure they are connected properly. However an Army study showed a very low rate of cable failure, and their guidelines are for them to be visually inspected and checked for not being properly connected, but that boxes more likely to fail should be replaced first. The Navy has different rules, since there is a harsher environment.

Scott: What data is available?

There hasn't been a lot of good data collection in the Army – mostly based on demand for components.

In the Navy, it is slightly better. But there are things like different use conditions, so that vibration causes a higher false alarm rate.

Russell: a lot is wasted on false alarms in absolute terms – but this might not be a lot for some systems, relative to their costs. But availability issues may be even bigger.

Tony – the major cost benefit is the extra up time, and improved logistics footprint through reduced need for spares. What is value of an operational system?

Russell: Operational availability is most valuable, logistics footprint is the next most valuable item. This is because of limited space. In the army the logistics footprint has not been seen as important, but it is getting more so as logistics costs are exceeding budgeted targets.

Projects require high availability – 90 – 95% required or else the project is in trouble.

Most programs can identify the top three degraders. This can be a candidate list. Then we need to look at the information available about these candidates. Factors to consider include availability of the information, accuracy of the information, and accessibility of the information, in the sense that some might be classified. If the latter is an issue the person with access to the information might have to run the model himself, and only report out the results.

CJ: While the TMAG name includes testability, the issues we are discussing are not test issues per se, but diagnosability issues.

Bill: True, but improved testability leads to faster repair. Features added to the product for testability also improves observability.

Aside from this, everyone agreed with CJ that this exercise is not going to involve testing in the

traditional sense.

Louis would like to see any model coming out of this effort be able to forecast the benefits of 100% cable diagnosis. Scott said that the diagnosis success rate needs to be an input to the model, so it should be able to handle 100%.

Action item: All those with access to information about systems should nominate some as candidates for analysis. It would be good if they had significant issues so that the results of our analysis would improve things in a way that would have high visibility. For each, the information available about it should be listed, how accurate and complete that information is in general, and how available that information is to those without clearance.

As a start, Louis proposed to use the field test cost model in one of his papers, which Louis adapted into a chart and used in the Economics of Test class. Scott will place this file on the web with the Minutes.