ule or critical path activities. There is no actual or implied relationship between E^3 engineering personnel performance and equipment technical performance. Good E^3 engineering advice can be overridden or ignored by project and/or program management, when technical performance is balanced against product cost, weight, schedule, reliability and other valid requirements or constraints. TPMs are not intended to take the place of risk evaluations, even though they are based on risk assessment techniques. Risks should continue to be identified, assessed, and mitigation plans developed for requirements compliance or system integration issues.

Conclusion

This E^3 TPM tool has successfully been used at Lockheed Martin and has proven to be useful for communicating E^3 concerns and status to program management. It is fast and easy to use because it is based on a readily-available spreadsheet application, and uses familiar project risk assessment techniques. It provides multiple layers of performance evaluation that enable justification of complex technical assessments. Although this spreadsheet is intended for use primarily by the E^3 specialists, it can be useful to share the detailed assessment data with project/program management. They seldom want or need all the minutiae supporting the top-level system E^3 performance confidence assessment, but are often reassured to know that it exists and can be produced if necessary. E^3 TPM evaluations can easily be defended when they are based on supplier qualification test data or very detailed assessments by subject matter experts.

This E^3 TPM approach provides a consistent methodology for assessing, predicting and tracking E^3 performance by allowing for archiving assessments to give a way to track the history of system and subsystem performance and the historical performance can be used with trend analysis for predictions for future similar equipment. This tool also provides technical assessments with little time invested. The most recent evaluation update required only three man-hours of labor for more than 45 subsystems on a current Lockheed Martin program. It is expected these TPMs will evolve further, as we refine our tools for effective communications with our program and technical managers.

February 2006 Reflector Submission from the Reliability Chapter

CENTER SECTION
Reliability – 6:00 PM, Wednesday, February 8
Impact of the ESD Trend Toward Ultra-sensitive Components

Terry L. Welsher and G. Theodore Dangelmayer

The IEEE Reliability Chapter held a joint meeting with the ESD (Electro Static Discharge) Society. This meeting focused on proactive measures to deal with the challenges of unexpected ESD failures in new locations in the manufacturing process due to the industry wide trend towards ultra-sensitive (ESD Class 0) components. The interactive discussion stressed countermeasures including both manufacturing and design enhancements.

The meeting was held at RSA Security in Bedford, MA. Visit the IEEE Boston Reliability Chapter website: http://www.ieee.org/bostonrel.

ARTICLE

Reliability Society – 6:00 PM, Wednesday, February 8

Impact of the ESD Trend
Toward Ultra-sensitive Components

Terry L. Welsher and G. Theodore Dangelmayer

ESD failures are occurring with increasing frequency, in unexpected ways and at new locations in the manufacturing process due to the industry wide trend towards ultra-sensitive (ESD Class 0) components. Even wafers are now failing due to ESD damage and mathematical models indicate these failures will increase with the scaling trends. Device design experts are experiencing increasing difficulties designing-in adequate ESD protection. The SEMETECH and ESD Association technology roadmaps are projecting sensitivities below 100 volts for all three simula-