INTRODUCING NEW STANDARDS TO THE USER COMMUNITY

(A Position Statement)

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ABSTRACT

The VHSIC Hardware Description Language (VHDL) and the Electronic Design Interchange Format (EDIF) are recent standards. The designation for VHDL is IEEE Standard 1076-1987, for EDIF it is EIA IS44. Based upon experiences with these two new standards, the panel that has been convened will explore how new standards can be introduced to industry and academia, what are the problems of introduction and what makes a new standard acceptable.

POSITION STATEMENT OF THE PANEL CHAIRMAN

The first question to be answered when considering the introduction of a new standard to industry is **"Why introduce the standard at all?"** Electronic system design and manufacturing requires data covering all design and manufacturing process aspects, and logistical support data (maintenance and technology insertion) for the final product. Creating, modifying, supporting and managing complex electronic systems is dependent on the ability to communicate design details between design disciplines and the integration of various types of data representing the multi-faceted product description. The total environment is built around a common set of needs. They may be summarized as the need to:

- Achieve communication of design data between companies carrying out different parts of the design process
- Transmit manufacturing and fabrication data for a designed part
- Encourage the development of new and innovative CAD tools

Furthermore, data needs dictate common requirements for provision of:

- Human readable functional specifications and documentation
- Machine readable functional specifications and documentation
- An interface to design/analysis tools
- A mechanism for the design process
- A mechanism to manage design data
- An interface to a data base
- Human/computer interaction in the design process
- Test information for a designed part

New, well thought out standards can support the above requirements and dependencies. Acceptable new standards will lead to productivity gains throughout the product life-cycle. Productivity gains will result in lowered life-cycle costs. Improved communication between contractors that must interact as the product is designed, fabricated, maintained and improved will result from a good set of standards that provide a product description understood by all.

The ease of access to design and description data is crucial to system maintainability for several reasons. Diagnosis of system errors, selection of alternative corrective actions, stocking of spare parts, ordering of replacement parts, and system upgrades all require access to product descriptive data that is easily understood by the people maintaining the equipment. Data access is equally important to component and system reliability. Accurate and understandable component design data must be available to system designers who integrate the components into a functioning system. Access to electronically stored data in compatible formats and with well defined semantics is crucial to the process of test and evaluation of prospective designs. Standard data syntax and semantics encourage the development of design tools to assist in the design process. The more automated the design process becomes, the simpler and less costly it may become to perform more and more product tests during the design process. More testing usually leads to more errors found early in the design process. The more design errors eliminated during the design of a product, the more reliable a product will be.

The second question to be answered when considering the introduction of a new standard to industry is **"How can a standard be introduced effectively?"** A standard meeting the needs described above can be required for use by **edict**. However, if cost effectiveness is not to be achieved through the use of the standard, the use of the standard will be resisted. Transition to the use of a new standard will, of necessity, be costly. Therefore, while edict may be needed to spearhead the transition, other driving forces must come into play to effect the transition. Industry, Government and academia must all be involved in the process of creating a new standard. This was the case for both VHDL and EDIF. Both new standards underwent several months of review and change as the first pass draft was exposed for all to examine, the first requirement for broad acceptance of a new standard.

The second requirement for broad acceptance of a new standard is an open standardization process culminating in a balloting procedure that involves a broad based, interested balloting constituency. The third requirement for acceptance is based upon the profit motive. Tool developers must perceive that the standard will be used, leading them to create CAD tools that will support the use of the standard. Producers of electronic hardware must perceive that their profits will grow through the use of the standard in combination with the new tools aimed at enhancing the designability, manufacturability, maintainability and reliability of their products.

Finally, the edict must spread from the primary organization spearheading the standard (the U. S. Government in the case of VHDL and the ad hoc EDIF Committee in the case of EDIF) to individual contractors who each see the benefits of forcing a transition to the new standard within their own company. Because of the interest in the technical aspects of a proposed standard, the academic community's involvement throughout the process will lead to introduction of the standard to students in their course work and research. These students, upon graduation, will trickle into industry with up-to-date information on how to make best use of the new standard thus solidifying the permanence of use.