



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

Group III ✓

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PROCUREMENT, LOGISTICS,  
AND READINESS DIVISION

NOV 29 1982

The Honorable Richard D. DeLauer  
The Under Secretary of Defense  
(Research and Engineering)

Dear Dr. DeLauer:

Subject: GAO Review on High Reliability Electronic  
Parts Testing and Data Requirements  
(GAO/PLRD-83-20)



We made a limited review of high reliability electronic parts testing and data requirements under the Department of Defense (DOD) standardization and specification program. We made this review because officials of a company that manufactures military electronic equipment expressed the view that DOD could significantly reduce its cost for electronic systems. These officials believed that DOD's requirement for a large number of different tests and data could be reduced by using electronic parts manufactured to a few well-defined reliability levels based on end use.

During our review, we attempted to (1) identify the same or similar parts having different test and data requirements, (2) identify the associated costs for such tests and data requirements, and (3) calculate the potential savings resulting from applying a single set of tests. We interviewed officials in 16 DOD, civilian agency, and private sector organizations, including DOD contractors, industry associations, an independent test laboratory, and a microcircuit manufacturer. We also reviewed available research and technical reports and examined a variety of DOD and private sector documentation. We limited our efforts to four groups of electronic parts--microcircuits, semiconductors, capacitors, and resistors--and placed emphasis on microcircuits because they were the most costly, complex, and troublesome of the four groups.

We were unable to obtain the information needed to identify significant numbers of the same or similar parts with different test and data requirements or the associated costs for such tests and data requirements. However, the information we were able to obtain through interviews with various officials and from an examination of documents that were readily available convinced us that there are difficulties with the standardization and specification program in the electronic parts area, specifically with the four family groups included in our review. Although we did not make a detailed review, we believe that DOD could use the

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information obtained in improving the standardization and specification program. Therefore, in September 1982, we provided a detailed briefing to officials of your office on the results of our limited work. The matters discussed during this briefing are summarized below.

- Need for the development and implementation of a centralized data collection and evaluation system for electronic parts. We noted that DOD did not have a centralized data collection system for electronic parts. Such a system would provide benefits to DOD, such as information needed to evaluate part number proliferation, information on the extent that military specification parts satisfy user needs, and data to forecast DOD consolidated needs for electronic parts by device type, reliability level, and technology. We believe you should consider developing a centralized data collection system, even if implementation has to be limited initially to selected electronic parts.
  
- Undue emphasis on tailoring of test requirements in the standardization and specification program. We noted a high incidence, on the part of program managers, of tailoring their testing requirements for electronic parts. That is, identical parts coming off the assembly line are subjected to differing testing requirements, and as a consequence, are no longer classified as the same part. This practice results in proliferation of nonstandard parts instead of promotion of standardization. We believe more emphasis should be given to standardization of testing requirements, particularly for the same or similar parts intended for the same or similar uses.
  
- Lack of availability of standard parts under the standardization and specification program. We noted that relatively few standard parts for high reliability applications are available from lists of qualified standard parts. The apparent result is further proliferation of nonstandard parts. We believe that the system for placing parts on lists of qualified standard parts should be reevaluated with a view towards expanding the number of high reliability parts available and ensuring there are qualified sources for those parts.
  
- Lack of standards for uniform quality and reliability levels for electronic parts. We noted that there is no uniformity in the testing methods prescribed for attaining desired reliability levels of electronic parts. More uniformity in the testing area would reduce the number of sets of tests and thus the costs associated therewith. We believe consideration should be given to increasing uniformity of testing requirements.

- Widespread use of different part numbers for identification of the same electronic parts. We noted the use of many different part numbers for identifying the same or similar parts, which results in the establishment of cumbersome and costly cross-indexing systems. We believe that DOD should consider the use of the National Stock Numbering (NSM) system or an equivalent numbering system, early in the design phase, to identify the same part by only one part number, regardless of the vendor or of the military system in which the part is to be used.
  
- More emphasis needed on central buying, stockpiling, and distribution of electronic parts. We believe that DOD could accrue significant cost savings and schedule benefits from initiating a system for central buying, stockpiling, and distribution of electronic parts. However, we recognize that such centralization should not take place without (1) improvements in the program directed toward achieving a greater degree of standardization and (2) acceptance by the parties concerned.
  
- Improvements needed in reporting accomplishments from the Military Parts Control Advisory Group's (MPCAG's) reviews. We noted that MPCAG had reported accomplishments from its reviews totaling \$96 million, which was identified as cost avoidance resulting from its recommendations on the standardization program (electronic parts), and that this \$96 million was included in DOD's report to the Congress as cost avoidance under that program. However, support was not available to show that these recommendations were implemented. We believe that if MPCAG's recommendations are valid, DOD should assure they are implemented. In any event, without evidence of implementation, these recommendations should not be reported as accomplished cost avoidance.

During our briefing, DOD officials stated they were aware that problems exist with certain electronic parts in the standardization and specification program, and that the information provided would be used to improve the program. We would appreciate being informed of any action taken on the matters discussed during the briefing and summarized above.

Sincerely yours,

  
Robert M. Gilroy  
Senior Associate Director