

*Discussed  
in T. Lipton  
3/24/73*

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**Bell Laboratories**

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January 17, 1973

Mr. F. H. Breitenstein  
Assistant Manager  
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Newark, New Jersey 07102

Dear Frank:

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E. R. DANCY

On January 9, 1973, Chris Sherrard of my organization met with Tom Ferme and a representative of WE/ISD to review progress in Western QA activity aimed at providing BTL with raw audit data in machine-readable form by March 31, 1973. After reviewing the outcome of that meeting, we are concerned that the objective date may be in jeopardy. Therefore we would like to offer advice and assistance that may be helpful to you.

The task of devising new Preliminary Report forms which are to be suitable for both initial recording of audit information by local product quality auditors and direct keypunching therefrom, involves detailed consideration of many technical requirements pertaining to the human engineering aspects of quality audit data recording and encoding and to the machine transmittal of character-string data. For example, such Preliminary Report forms must:

- (1) be easy for product quality auditors to be retrained to use;
- (2) be simple for filling out and for key-punching;
- (3) minimize total number of key-punched cards required per preliminary report form;
- ✓ (4) be 8-1/2 x 11 inches in size for storage considerations;
- ✓ (5) reflect the intrinsic hierarchical structure of the data sets, and the logical relationships between the several data items within the hierarchical structure;

- ✓✓✓ (6) provide for a wide variety of different character-string types, which have some common items in each;
- ✓✓✓ (7) provide for auxiliary data (e.g., product identifications, nonconformance memoranda, etc.) in addition to the raw audit data itself;
- (8) provide cross-referencing data items for ease of error correction, deletion, etc.

John A. Conte of WE/QA, Kansas City Works, and Phil H. Thomas of my organization have devised such Preliminary Report forms. Their efforts were productive and timely because:

- (1) both WE/QA's and BTL/QAC's requirements needed to be taken fully into account;
- (2) both engineers are experienced in both quality engineering and in machine data processing; and
- (3) WE/QA at Kansas City plans to machine process their audit data directly from punched cards, which, being a relatively primitive data recording means, is characterized by the most stringent of formatting restrictions.

Messrs. Conte and Thomas devised a scheme of new Preliminary Report forms which are engineered to meet known and foreseeable technical requirements and constraints. Although the WECO Corporate Standards requirements of concern to WE/ISD were unknown to them, the Conte-Thomas Preliminary Report forms could be readily modified to satisfy those requirements by the simple task of inserting the necessary items in the appropriate columns and/or redefining the character-string type code as necessary. Hence, new Preliminary Report forms have been developed which, with at most trivial modifications yet required, are fully suited, technically, for immediate nation-wide adoption by WE/QA. A "field trial" of these forms was started in October 1972, wherein we actually are using them with apparatus-rated product audit data for:

- (1) initial recording of the raw audit data by the product quality auditors at Kansas City;
- (2) key-punching of IBM cards directly from that initial recording; and
- (3) computer inputting and storage of that data from those punched cards in our information system at BTL-Holmdel.

The success of this field trial has amply demonstrated the adequacy of the Conte-Thomas Preliminary Report forms.

WE/ISD's proposal for their Preliminary Report form as presented tentatively in the January 9, 1973 meeting fails to meet several of the requirements, as for example the following:

- (1) not readily adaptable to repair audit data, for which certain local standards data items and rating calculations are inserted onto the Preliminary Report form by the product quality auditor;
- (2) does not provide for Product Identification ("DFA") character string data as called for in the BTL/QAC request;
- (3) does not provide for nonconformance memoranda character string data;
- (4) is not adaptable to the frequency counts type of data items of wire and cable variables audit data;
- (5) is not adaptable to performance tests data of installed product audits;
- (6) does not fully reflect the hierarchical structure intrinsic to audit data and the logical relationships between data items due to that structure;
- (7) requires far more cards for wired-equipment "counts" data than necessary; and
- (8) is larger in size than 8-1/2 x 11 inches and hence imposes storage problems.

We recommend that the Conte-Thomas Preliminary Report forms be presented to the QAIS Task Force for expeditious review, modification, acceptance, and implementation. We recognize that some modification may be necessary to meet Western Corporate Standards requirements, and we will expect to consult and review with you the considerations that may necessitate changes to the preliminary report forms to ensure that BTL needs are met.

In the interim, consistent with the agreement between Howard and Simmons, we will meet with the assistant managers of the regions to review the form in which data is presently available to us and to discuss interim means for presentation of the data to us. We are certain that the regions will communicate these interim arrangements to the QAIS group and that any interim arrangements will not impede the activities of the QAIS group.

Yours truly,



E. Fuchs

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See next page

Mr. Breitenstein - 4

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