# LIDS

*the*

## Lotus Inspection Data System

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### A Personal Computer System

### for the Management of In-Process Inspection Data

The analysis of in-process inspection data contributes to and augments their effectiveness by measuring the number, type and effort required to find and correct the defects found at various stages of devolpment. Defect trends can be tracked, analyzed, and potentially defect-prone or poorly-inspected components identified. These analyses are dependent on the availability of an inspection database and analysis tool such as LIDS that can provide a responsive means for storing and evaluating the inspection data.

There are three reasons for providing this description of LIDS: first, it provides you with an operating manual for an existent product[1] that is available to perform this evaluation quickly, with little effort needed for tool development; second, it describes an architectural model that can be used with different evaluation techniques; and, third, it shows a number of types of in-process inspection analyses which can be performed.

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1  For more information about LIDS, contact RGE Software Methodologies at 30 Main Street, Port Washington, New York 11050, telephone (516)944-8058, e-mail: rge.com@worldnet.att.net

## 1  Introduction

The Lotus Inspection Data System (LIDS) provides facilities for the entry, storage, analysis, reporting, and maintenance of data from in-process inspections. LIDS consists of a formatted Lotus-123 spreadsheet for MS/Windows personal computers and uses standard Lotus-123 features. It operates under Lotus-123 for MS/Windows. The inspection data may also be extracted from LIDS for more extensive analysis by other systems.

LIDS menus guide you through the selection of functions. These menus are hierarchical and operate similarly to Lotus-123's in "classic" mode. For example, to analyze in-process inspection data you would select ANALYSIS from the top LIDS menu. The inspection data is copied from the database to the workbase (a work area within the LIDS spreadsheet, identified in Figure 1). Using subsequent menus to specify various selection criteria, a portion of the database is chosen for analysis and the unwanted inspection records are deleted from the workbase. The selected inspections can then be analyzed further using successive menu choices.

LIDS provides functions for reviewing the results, and then helps in preparing tabular and graphical reports of the analysis. Although familiarity with Lotus-123 is recommended to operate LIDS, few native Lotus commands are normally used except to initialize Lotus-123, load the LIDS spreadsheet, and to quit Lotus-123. All of LIDS functions, including the in-process inspection database, are packaged within a common set of worksheets which comprise the LIDS file.

The five worksheets are titled LIDS, DEFECTS, PERFORMANCE, CONTROL, and DISPERSION. The body of the menus, macros, data storage and reporting areas are in the LIDS worksheet. The four other worksheets contain the "model" charts for the various graphical analyses. They are only valid for the immediately  performed graphical analysis and are otherwise used for internal LIDS processing.

The architecture of the LIDS worksheet is shown in Figure 1. There are four major components, or areas, of the spreadsheet which you will interact with when using LIDS. First, there is a data entry area, (ENTRY), which looks like a project's inspection summary report, that is used to enter the identification, performance, and defect data for each inspection. Second, there is a database area, (DATABASE), which is used to store the inspection records. Third is a working database area, (WORKBASE), that is used for the selection of inspection records during data analysis. Fourth, there are the data analysis tables, (REPORT), where results of analysis are placed for display and reporting. Each of these spreadsheet areas are visible at one time or another during LIDS operations.

There are three other components of the spreadsheet that are normally not visible, but which make possible all LIDS functions. They are the LIDS menus (MENU), macros (MACRO), and selection criteria (CRITERIA). The menus call upon the macros and the selection criteria to perform the various LIDS functions for entering data, storing it in the database, analyzing the accumulated inspection records, and, if necessary, making changes to the inspection records. These three components drive LIDS and they are not intended to be modified during normal use.

When working with the LIDS spreadsheet, note that inspection data has a different appearance in the data entry and data analysis areas from the database. Inspection data is entered, maintained, and displayed following analysis as tables, reports, and graphs. It is stored and displayed in the database though as a linear record of fields containing the inspection identification, performance, and summary defect data. When you wish to

examine, change, or review an inspection record, LIDS will compress the fields back to the entry format for ease of use. The linear inspection record is used for selection, analysis, and some maintenance. It also makes it straightforward to extract the database for use in other spreadsheet or data management systems.

# LIDS  ARCHITECTURE

LIDS | DEFECTS | PERFORMANCE | CONTROL | DISPERSION

**LIDS  Menus**
**"MENU"**

**LIDS Macros**
**"MACRO"**

**Selection Criteria**
**"CRITERIA"**

**Inspection Working Database**
**"WORKBASE"**

**Inspection Database**
**"DATABASE"**

**Data Entry  &**
**Maintenatce**
**"ENTRY"**

**Data Analysis**
**Report &**
**Tables**
**"REPORT"**
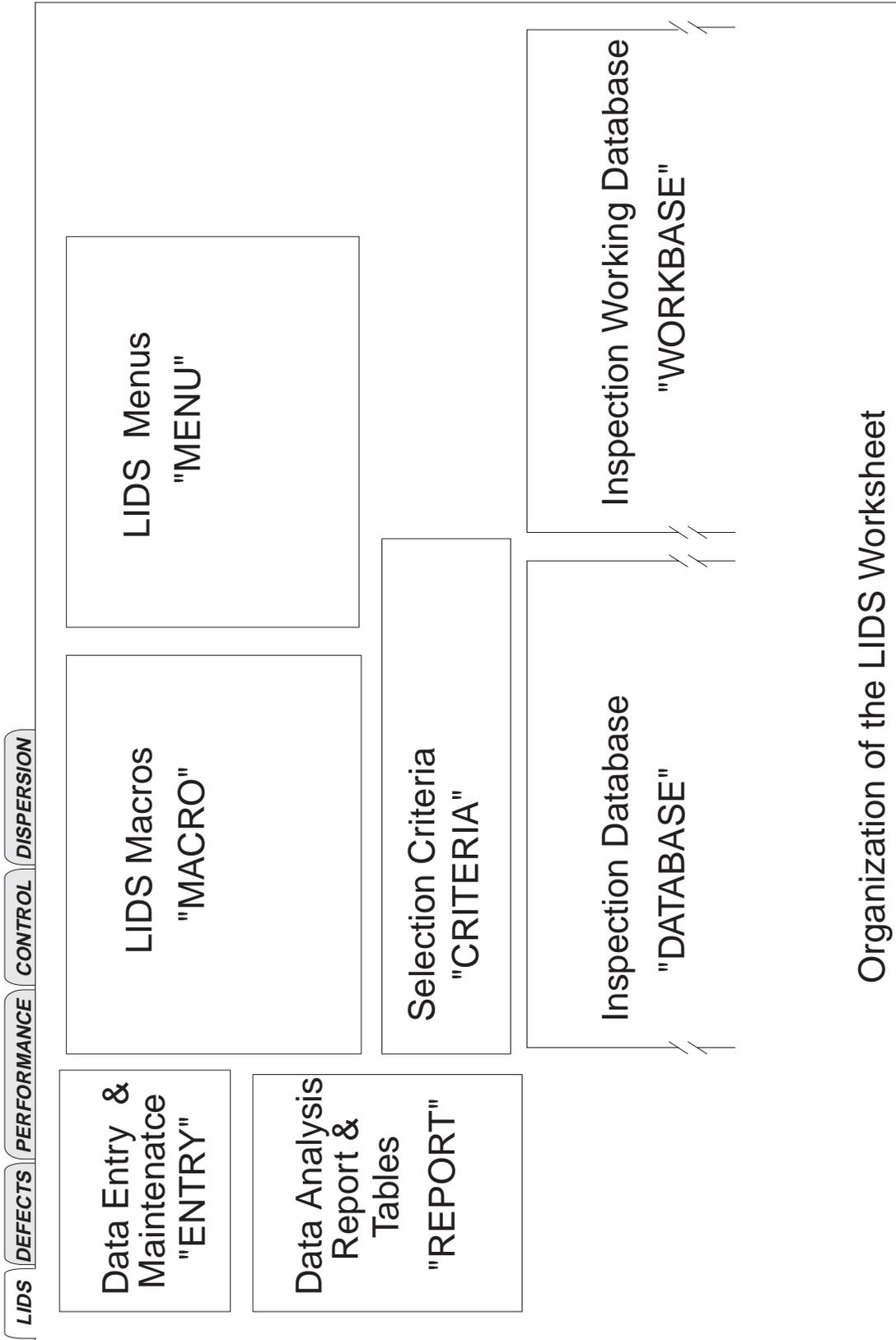
Organization of the LIDS Worksheet

# LIDS ARCHITECTURE

| LIDS | DEFECTS | PERFORMANCE | CONTROL | DISPERSION |

**Data Entry & Maintenatce "ENTRY"**

**LIDS Macros "MACRO"**

**LIDS Menus "MENU"**

**Data Analysis Report & Tables "REPORT"**

**Selection Criteria "CRITERIA"**

**Inspection Database "DATABASE"**

**Inspection Working Database "WORKBASE"**

Organization of the LIDS Worksheet

## 2  Requirements

### 2.1  Hardware:

– an MS/Windows compatible personal computer,

– hard disk storage for Lotus-123, the LIDS worksheets, and report and graphics files that will be produced

### 2.2  Software:

– MS/Windows Version 3.1 or higher,

– Lotus-123 for Windows Version 4, or higher,

– LIDS master spreadsheet.

### 2.3  Personnel Qualifications:

– ability to operate an MS/Windows PC,

– completion of Lotus-123 on-line tutorial, or equivalent operating experience,

– knowledge of project inspection data entry, analysis, and reporting requirements.

### 2.4  Restrictions

The major restriction of LIDS is that it does not produce any printed reports or graphs directly, but rather prepares Lotus-123 ASCII report files and copies graphics to the Windows clipboard (LIDS reports may also be copied to the clipboard if wanted). These files can then be used by a wide variety of word processing, desktop publishing, and graphics programs to produce the desired reports.

The LIDS inspection database is limited to 8,000 records. This is a maximum and may be restricted by hardware and operational considerations. The LIDS spreadsheet is approximately 200K bytes, and each inspection record requires an additional 1,200 bytes. Also, each LIDS operation, such as sorting or selecting records, requires additional computer time as the number of inspection records increase. Depending on the capacity and speed of the computer that is used, you may want to limit a typical LIDS database to hundreds rather than thousands of inspections.

Larger projects will probably want to segment their inspection databases along functional, periodic, organizational or some other boundaries anyway. Smaller projects would typically segment their inspection database by function and release. For those cases when a broader study is required, the inspection databases can be extracted and merged for further analysis by LIDS or another system.

## 3  Operating Lids

Before using LIDS for either the first time or for a new inspection database, copy the LIDS master spreadsheet and identify the copy with an appropriate file name for the project's inspections. This copy will be the working LIDS database, and should be backed up after making any additions or changes (e.g. when new inspection records are stored in the LIDS spreadsheet). Retain the original copy of LIDS as the master spreadsheet. LIDS is now ready for you to add data, with the most recently entered inspection record placed progressively at the end of the database.

To start LIDS, load the Lotus-123 program. When Lotus initialization is completed, retrieve the working copy of the LIDS database using the Lotus open command. When LIDS is loaded, start the "classic" LIDS menus by using Ctl-M (depressing the Control and the "M" keys together). The LIDS menu will be will then be at the initial level, which provides the you with the choices of entering, analyzing, maintaining, or saving the inspection data.

Selection of any LIDS menu option is performed by highlighting the option name using the arrow keys and depressing the Enter key. Alternatively, the first character of the option name may be entered to select the option (each menu's options have unique first characters for this reason). A QUIT option is provided on each menu to enable you to return to the previous level of the LIDS menu hierarchy (or to the Lotus READY mode from the initial LIDS menu). QUIT should be used to exit a LIDS menu rather than using the ESCape key. The use of ESCape will cause a return to the Lotus READY mode rather than backing up to the preceding LIDS menu (exiting LIDS is sometimes desired).

If you do exit LIDS, LIDS may be restarted at any time from the Lotus READY mode by depressing the CTL and the "M" keys together, called Ctl-M. This will restart LIDS at the top menu. Alternatively, Ctl-X can be used. This facility (depressing the CTL and the "X" keys together) will restart LIDS from the ANALYSIS/RESULTS menu. This feature may save a number of steps if you inadvertently fall out of LIDS following a selection process. The selected records in WORKBASE will remain as they were before you left LIDS. Also, Ctl-D or Ctl-S (depressing the CTL and the "D" or "S" keys together) to restart LIDS at the Dispersion or Performance graph menus. This will facilitate the copy/paste operations for a series of performance and dispersion charts to another reporting program, maintaining the same set of inspections and the same Sigma reference level.

The LIDS spreadsheet must be saved before ending a work session to preserve any additions or changes that have been made to the database (analysis does not change the database). Use either the LIDS SAVE function or the native Lotus file save commands. It is important to remember that all of the work you have done with LIDS will only be permanently recorded on disk if you explicitly save the spreadsheet.

To end a LIDS working session, first save the active LIDS spreadsheet if you have made any changes that you wish to retain. Then exit from the LIDS menu by entering the QUIT option on the first, or top level, LIDS menu. This will place you in Lotus READY mode. Use the Lotus close command to exit, and the session will be over.

A few guidelines for applying LIDS are:

- Make a hard copy of each entered inspection and keep it with the original inspection records.

- Overall statistics, such as the number of inspections performed or total inspection effort, are useful and can be obtained from the inspection report. The defect charts for type, class, and severity may also be useful for the entire database, as well as for selected sets.
- Analyze the inspections further in small groups. Select a current range of inspection dates. Then select on other criteria, such as type of inspection or product, to refine the set. In this way the results are timely and in-process, and are relevant to product development.
- The inspection performance and evaluation graphs will become cluttered if a large number of inspections (more than 50) are used. Practical reasons of timeliness and utility will probably dictate that smaller rather than larger groups of inspections be evaluated together.
- Continually evaluate the inspection data. Develop a regular reporting program that tracks both current inspections and trends.
- Where any changes or additions are involved, remember — save, save, save the LIDS spreadsheet.
- Finally, LIDS can also be used to track inspection schedules. Make an initial entry for each forthcoming inspection with a unique designation, such as a special disposition. These scheduled inspections can then be followed and reported.

# Initial LIDS Menu

```
┌──────────────────────────────────────────────────┐
│   ┌──────────────────────────────────────────┐    │
│   │ ENTRY   ANALYSIS  MAINT  SAVE  QUIT │     │
│   └──────────────────────────────────────────┘    │
│                                                    │
│              ╔═══════════╗                         │
│              ║  MENU 2   ║                         │
│              ╚═══════════╝                         │
│                                                    │
│   ┌──────────────────────────────────────────┐    │
│   │ ENTER  REVIEW LIST  STORE  CLEAR  QUIT │   │    │
│   └──────────────────────────────────────────┘    │
│                                                    │
│   ┌──────────────────────┐  ┌──────────────┐       │
│   │ TITLE  SAVE  QUIT     │  │  YES NO      │       │
│   └──────────────────────┘  └──────────────┘       │
│                                                    │
│          ┌────────────────────────────────────┐    │
│          │ VIEW  SELECT  OPEN  LIST  QUIT │    │    │
│          └────────────────────────────────────┘    │
│                                                    │
│                        ┌──────────────────────┐    │
│                        │ TITLE  SAVE  QUIT     │    │
│                        └──────────────────────┘    │
│                                                    │
│        ┌──────────────────────────────────────┐    │
│        │ REVIEW  UPDATE  DELETE   LIST QUIT │  │    │
│        └──────────────────────────────────────┘    │
│                                                    │
│   ┌──────────────────┐  ┌──────────────┐           │
│   │ CANCEL SAVE      │  │  NO  YES     │           │
│   └──────────────────┘  └──────────────┘           │
│                                                    │
│                        ┌──────────────────────┐    │
│                        │ TITLE  SAVE  QUIT     │    │
│                        └──────────────────────┘    │
└──────────────────────────────────────────────────┘
```
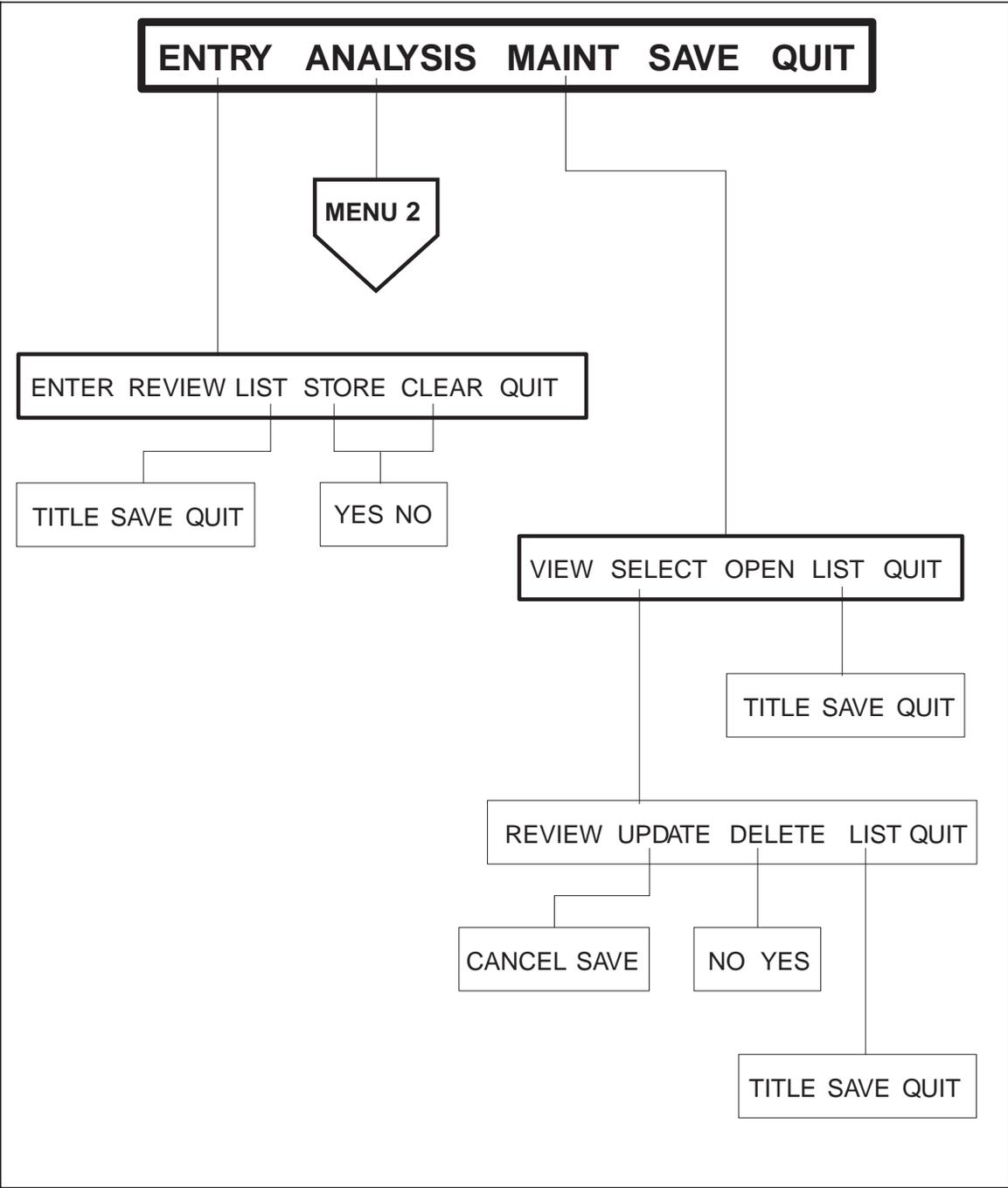
*Figure A-2*

## Menu 2 - ANALYSIS



```
                              ┌─────────┐
                              │ MENU 2  │
                              └────┬────┘

  VIEW      CHOOSE      SORT    LIST   RESULTS   EVALUATE    QUIT

                                              ┌────────┐  ┌────────┐
                                              │ MENU 3 │  │ MENU 4 │
                                              └────────┘  └────────┘

                          TITLE   SAVE   QUIT

      INSP-DATE   COMP-DATE   SIZE   DENS   RATE   PREP   QUIT

                  ASCENDING     DESCENDING

  ENTIRE   PROJECT   RELEASE   ACTIVITY   DOCUMENT   COMPONENT   OTHER   QUIT

  INSP-DATE   MODERATOR   1:MEET.   2:INSP.   DISP.   COMP-DATE   OTHER     QUIT

          GREATER-EQ   EQUAL   LESS-THAN   QUIT

  EXAM-RATE   PREP-RATE   SIZE   DEF-DENS   X-MANUAL   QUIT

      GREATER-EQ   EQUAL   LESS-THAN   QUIT
```

*Figure A-3*

## Menu 3 - RESULTS
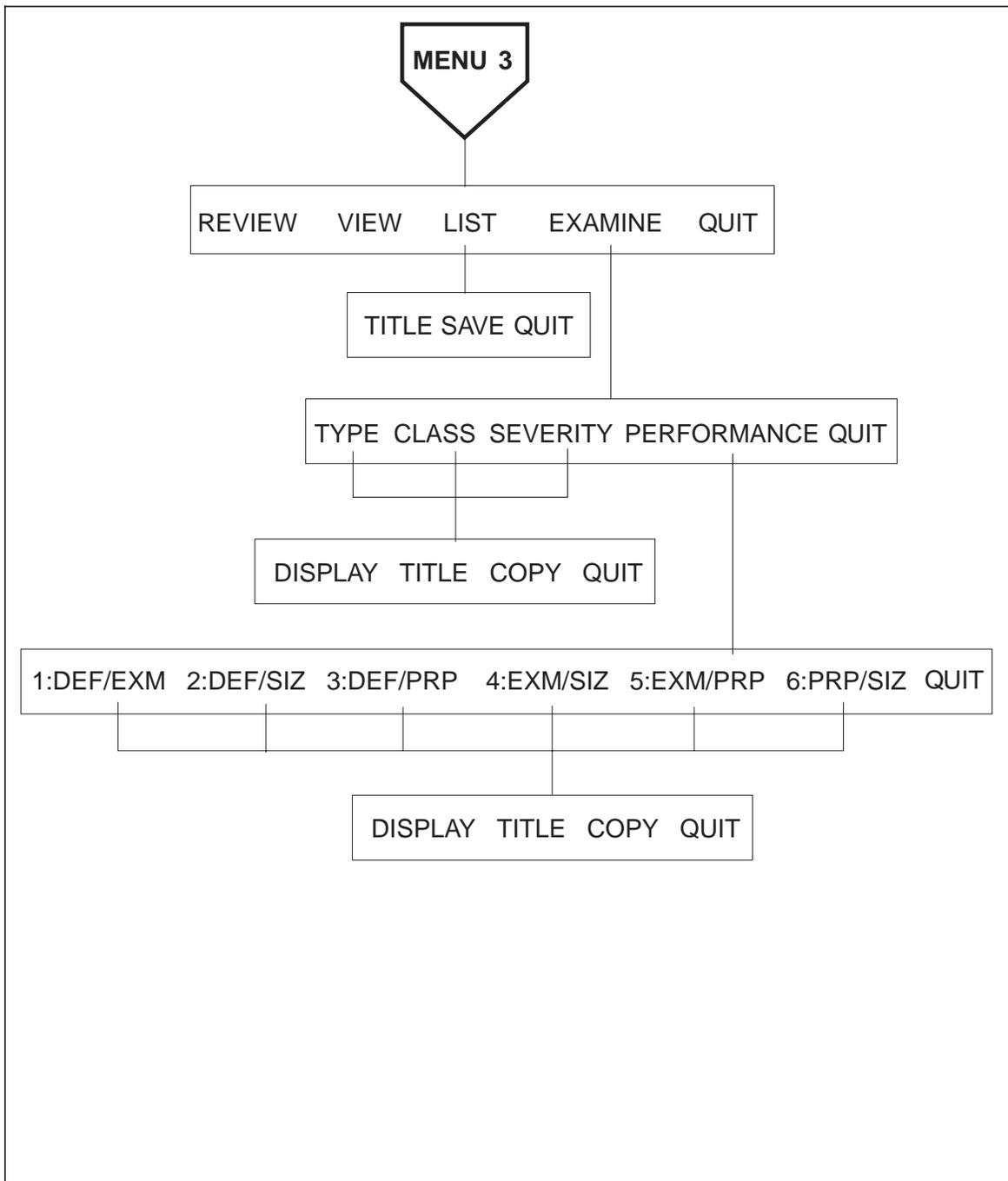


*Figure A-4*

## Menu 4 - EVALUATION

```
                    ┌─────────────┐
                    │   MENU 4    │
                    └──────┬──────┘
                           │
         ┌─────────────────┴────────────────┐
         │  CONTROL    DISPERSION    QUIT    │
         └─────┬────────────────┬────────────┘
               │                │
               │        ┌───────┴──────────────────────────────┐
               │        │ 1-SIGMA  2-SIGMA 3-SIGMA CUSTOM  QUIT │
               │        └──────────────────────┬───────────────┘
               │                                │
               │                  ┌─────────────┴──────────┐
               │                  │ SIZE  EXAM  PREP  QUIT  │
               │                  └────────────┬───────────┘
               │                               │
               │               ┌───────────────┴────────────────┐
               │               │ DISPLAY  TITLE  COPY  QUIT      │
               │               └────────────────────────────────┘
               │
    ┌──────────┴──────────────────────────────────────────────┐
    │ WEIGHTED VARIABLE AVERAGE  1:MAX 2:MIN QUIT              │
    └──────────────────────┬──────────────────────────────────┘
                           │
              ┌────────────┴───────────────┐
              │ DISPLAY  TITLE  COPY  QUIT  │
              └────────────────────────────┘
```
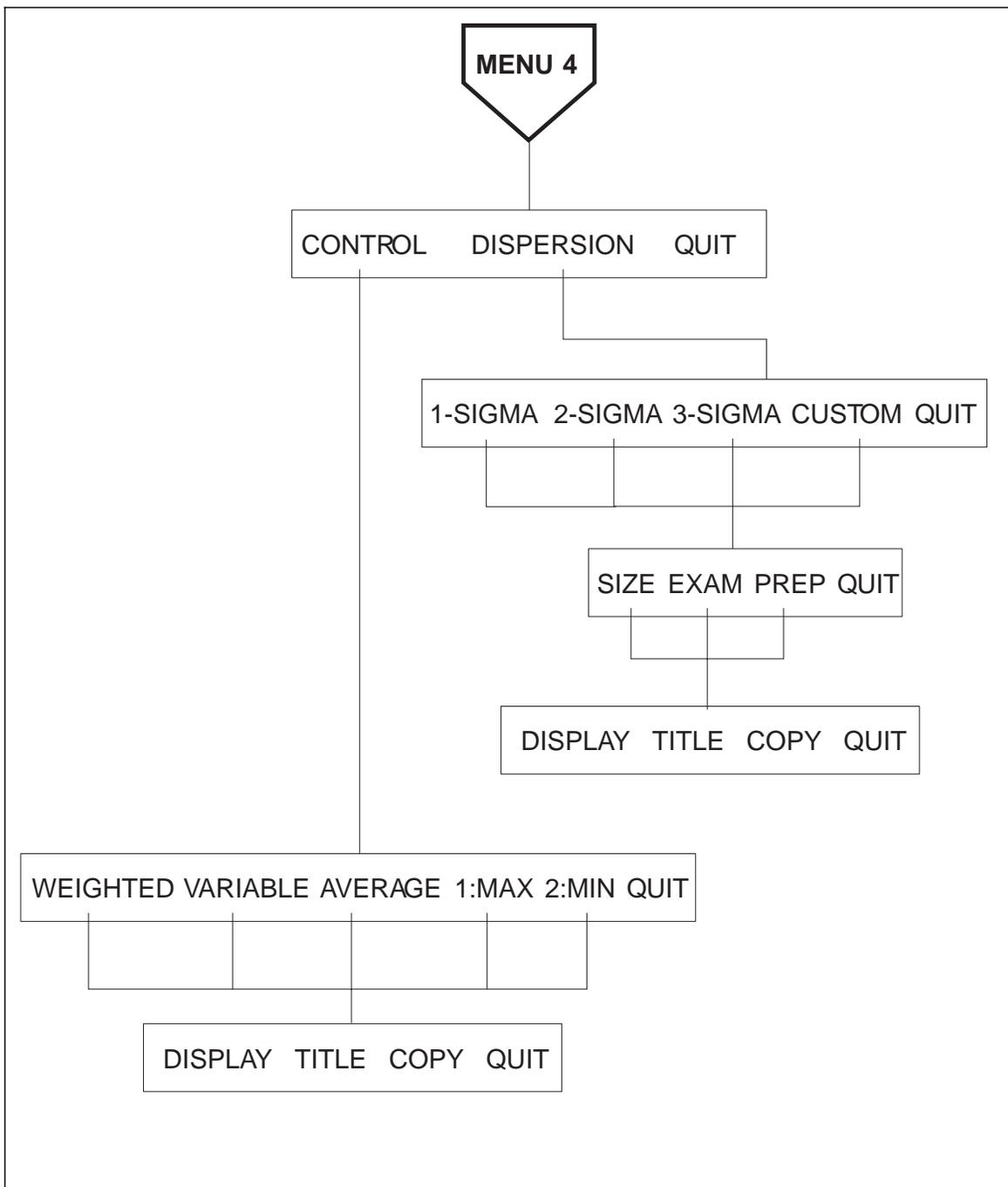
*Figure A-5*

## 4  Using Lids Menus

LIDS functions are accessed through the LIDS menus, illustrated in Figures A-2 thru A-5 on the four prior pages. The menus are hierarchically organized into three major service areas: ENTRY, ANALYSIS, and MAINTenance. Inspection data may also be accessed through 'native' Lotus commands if you have the necessary experience using Lotus-123. The LIDS database may also be extracted to other spreadsheets, or other systems, for more extensive analysis. You should always exercise caution to assure that the LIDS spreadsheet with the most current inspection data is saved before using any native Lotus functions.

The initial, or top level LIDS menu will present the following choices:

| ENTRY  ANALYSIS  MAINT  SAVE  QUIT |
|---|

- ENTRY is used to add new inspection records to the database.
- ANALYSIS provides reports and graphs of inspection data for all or a selected part of the database.
- MAINT allows you to view and print the database, to change information in the database, and to select a record to be printed, updated, or deleted from the database.
- SAVE writes the LIDS spreadsheet back to disk to preserve any additions, deletions, or changes that were made to the inspection data.
- QUIT returns control to native Lotus mode for ending the session.

When SAVE is selected to rewrite the LIDS spreadsheet, reply with Enter to verify the file when requested by Lotus, and then with " R " when permission to rewrite is requested. Depress the Enter key to restore the LIDS menu.

QUIT will exit LIDS and return to the Lotus READY mode where any native Lotus-123 commands may be used. This is the normal path for terminating LIDS and Lotus. At lower level menus, QUIT will return to the previous menu.

### 4.1  ENTRY

The ENTRY menu offers the following options:

| ENTER  REVIEW  LIST  STORE  CLEAR  QUIT |
|---|

***4.1.1  ENTER:*** When selected, the ENTER option will position the cursor at the first location of the inspection data entry area of the LIDS spreadsheet. Cursor movement will be restricted to data entry cells only, skipping over calculation and formatted fields. The cursor may be positioned with any of the cursor movement keys, and data may be entered or changed in any cell, in any sequence, and at any time while the ENTER option is active. To remove unwanted data, replace the data in the cell with blanks.

To complete data entry and to return to the ENTRY menu, enter no-data, i.e. depress the Enter key without any other entries. Be sure to verify the data and make any necessary corrections before leaving the ENTER option. There will be a delay when exiting ENTER while LIDS recalculates the new data. ENTER may be re-selected to make changes at any

time prior to selecting the STORE or CLEAR options. For clarity in later readings, I recommend entering all data as upper case.

***4.1.2  REVIEW:*** REVIEW allows you to move about the data entry area using any of the cursor movement keys, including page-up, page-down, tab, home and end. Use REVIEW to check your work before storing the inspection record in the database. Be careful not to enter any data while in REVIEW mode. Exit REVIEW by depressing the Enter key with no-data.

***4.1.3  LIST:*** The LIST option will write a file of the inspection data entry report. See Figure A-6 for a sample. The report files are ASCII, and Lotus always appends a .PRN file name extension. They will be written to the disk directory that is established by using the native Lotus 1-2-3 User Setup option of the Tools menu. It is recommended that the entered data be listed and printed later for documentation. All occurrences of LIST options in any of the menus will behave similarly, and when LIST is selected, the following options will be presented:

> **TITLE   SAVE   QUIT**

You may optionally prepare a report title by selecting the TITLE option. Type a meaningful report title and then press the Enter key to record the title and to return to this menu. After entering the report title, or not, choose the SAVE option to write the report to disk. SAVE will request a report file name of eight or less characters (do not enter an extension). If the file name is unique, the report will be written and you will be presented with a Lotus menu. Reply with Enter and you will be returned to the RESULTS menu.

If the file name is already present you have the option of canceling the write operation or rewriting the file. Enter R, and the file will be rewritten, as above. Enter C and the operation will be canceled and you will be returned to Lotus ready mode. Ctl-M or Ctl-X will return you to LIDS at the initial or the RESULTS menu respectively.

QUIT will return you immediately to the ENTRY menu.

***4.1.4  STORE:*** The STORE option will add the entered inspection data to the database. It will be reformatted and added as the last record of the inspection database. Permission is requested before the STORE operation is performed. Selecting YES will store the data and NO will return to the ENTRY menu.

Upon completion, STORE will offer the option of clearing the entry area. Again, either YES or NO will clear or leave the data intact. STORE will return to the ENTRY menu either directly or after the entry area is cleared.

***4.1.5  CLEAR:*** The CLEAR option will reset the inspection data entry area to null and zero values. Confirmation, YES or NO, is requested before the CLEAR option is executed. Upon completion, CLEAR will return to the ENTRY menu. If the entry area is cleared, some

calculated fields will be re-initialized to an "ERR" value. This is normal, and is the result of the calculation dividing by zero in the initialized state.

**4.1.6  QUIT:**  QUIT will return you to the initial LIDS menu.

## 4.2  ANALYSIS

Analysis is the central function of LIDS and, given its large variety of selection, reporting, and evaluation options, the most complicated. Though this set of options may be complex, they are the most valuable part of the system. Some practice with the options will be helpful when first learning LIDS. Remember, nothing will be changed on the disk resident database unless you choose to SAVE the results of your work. If you exit LIDS in the middle of an analysis, Ctl-X will bring you back to the RESULTS options menu where you can resume your work. Ctl-M will allow you to restart from the beginning.

Selecting ANALYSIS will first copy all of the inspection records from the database to the workbase. The time required for the initialization of workbase depends on the size of the database and the speed of your computer. After the initialization is completed, ANALYSIS will present the following menu options:

| VIEW  CHOOSE  SORT  LIST  RESULTS  EVALUATE  QUIT |
| --- |

As you can see from the diagrams of the menus, Figures A-2 thru A-5, the majority of LIDS functions are for the analysis of the inspection data. A brief summary of the analysis functions are:

- VIEW allows you to look at the selected inspection records currently in workbase.
- CHOOSE selects the inspection records for subsequent analysis based on various criteria.
- SORT sequences the chosen inspection records.
- LIST writes an ASCII file of the identification and performance data for the chosen inspection records. Detailed defect data is not listed.
- RESULTS provides tabular and graphical reports of the defects and performance of the chosen inspections.
- EVALUATE provides a variety of statistical quality control and dispersion graphs of the chosen inspections.
- QUIT returns control to the initial LIDS menu.

Analysis of the inspection data always begins with choosing the inspection records to be analyzed. Either all of the database records may be chosen, or only those meeting specified criteria for key fields. When the inspection records have been chosen, they may be sorted and listed. The analysis is now ready for both tabular and graphical reporting of the results and statistical evaluation. Tabular reports and graphs will be displayed for review. They may be titled and then saved for later printing using a variety of word processing and graphics programs.

**4.2.1  VIEW:**  VIEW provides a general facility to scan the selected inspection database records. When ANALYSIS is first chosen the entire database is copied into a work area called workbase, and VIEW will enable you to review these records prior to making any further selections. The field names appear as a fixed upper margin, and the first field of

the inspection records, which is an inspection number inserted into workbase by ANALYSIS, appears as a fixed left margin. The cursor control keys, including paging, may be used to display any inspection record and field, but the cursor will not enter either the upper or left margins. Data can not be changed when VIEW is active. To exit VIEW and return to the ANALYSIS menu, depress the Enter key with no-data.

***4.2.2  CHOOSE:***  The CHOOSE option displays the following menu:

| ENTIRE  PROJECT  RELEASE  ACTIVITY  DOCUMENT  COMPONENT  OTHER  QUIT |
|---|

- ENTIRE: will select all the database records (this is the default when ANALYSIS is first entered and the entire contents of the database will be in workbase). ENTIRE can also be selected to re-initialize a series of new choices.
- QUIT: will always return to the ANALYSIS menu.
- OTHER: will present these additional menu options to choose from:

| INSP-DATE  MODERATOR  1:MEET.  2:INSP.  DISP.  COMP-DATE  OTHER  QUIT |
|---|

- OTHER: presents these additional options to choose from:

| EXAM-RATE  PREP-RATE  SIZE  DEF-DENS  X-MANUAL  QUIT |
|---|

**4.2.2.1  CHOOSE options:**  Each of these options requests a criteria value before proceeding. Inspections are selected with a logical or numerical comparison, as appropriate, between the criteria value and the field value for each record currently in workbase. Only those records with field values matching the criteria are chosen from workbase. The others are deleted. A separate copy of the database in workbase is used so that the original inspection records are not altered by any actions of ANALYSIS. On completion, VIEW may be used to examine the chosen records further.

When specifying selection criteria, keep in mind that a logical comparison is performed and is sensitive to the presence of leading or trailing blanks, and they should not be included either in the inspection data or in the criteria. Logical, but not numeric, selection criteria may include the " * " and " ? " wild-card characters, as well as the " ~ " negative selection character to extend the flexibility of the selection criteria. Refer to the "Data Commands" section of the Lotus manual for further instructions on their use.

Dates are entered as "mm/dd/yy," with the slashes present, when they are used as a selection criteria for the INSP-DATE and COMP-DATE. Be careful if you are going to select inspection records based on their  major defect density (DEF-DENS), as defect density is a dependent variable, a result of  the inspection, and is not independent.

There is a subsequent menu selection for each date and numeric option:

| GREAT-EQ  EQUAL  LESS-THAN  QUIT |
|---|

- GREAT-EQ: Choose inspections that are greater than or equal to the criteria.
- EQUAL:  Choose inspections that are equal to the criteria.
- LESS-THAN: Choose inspections that are less than the criteria.

If a value is invalid, i.e. a date of 9/31/87, a RE-SELECT menu will be displayed. Values and dates may be repeatedly selected until the proper set of inspection records is obtained.

X-MANUAL is unique. This option is provided to allow you to manually choose the records you wish to analyze. When X-MANUAL is used, you may alter any of the selection fields in the working copy of the database. Workbase is opened to you for input. You may enter a new value or use the Lotus edit function to place a unique character in one of the selection fields for each record that you wish to include in the analysis. All of the keyboard is available.

For example, if you choose the Project field for manual selection, either replace the current Project name with a " ] " character, or by using the Lotus edit key (F2), place " ] " as the first character in the field. When you have marked all of the records that you wish to choose, exit X-MANUAL by keying Enter with no-data.

X-MANUAL will then return you to the CHOOSE menu, where you may now use the options and criteria for selecting the inspection records you have marked. In this example, you would select the PROJECT option and use " ]* " as the selection criteria to choose every record with the Project field beginning with " ] ".

You may perform CHOOSE multiple times against the workbase with various options before using any of the other ANALYSIS options, such as SORT or EVALUATE, resulting in a selected set of records that meet a number of different criteria. When the records matching the selection criteria are chosen, you will be returned to the ANALYSIS menu.

*4.2.3  SORT:*  The SORT option arranges the chosen inspection records into ascending or descending order by a selected sort key field. This is a single key sort, without a secondary key. SORT displays the key selection menu:

> **INSP-DATE  COMP-DATE  SIZE  DENS  RATE  PREP  QUIT**

**4.2.3.1  SORT options:**  The SORT options specify the key fields, except QUIT, that are used for EVALUATION of the inspection records. Sorting will have no effect on reporting the RESULTS of the inspections, only on their EVALUATION. These fields include the dates when the inspections were held or completed, and inspection performance factors:

- INSP-DATE:  Orders the inspection records by the date the inspection meeting was held.
- COMP-DATE: Orders the inspection records by the date the inspection was completed, including all rework.
- SIZE: Orders the inspection records by the size (lines) of the inspected work product.
- DENS: Orders the inspection records by the major defect density (in defects per 1,000 lines).
- RATE: Orders the inspection records by the rate the work product was examined (in lines per hour).
- PREP: Orders the inspection records by the rate at which the product was prepared (the size of the work product divided by the total preparation time; then divided by the total number of inspectors less the author).

When any of these menu options is selected, it is immediately followed by a menu requesting the choice of sorting in either ascending or descending sequence:

> **ASCENDING  DESCENDING**

You must choose one or the other. You will return to the ANALYSIS menu when sorting is completed.

***4.2.4  LIST:***  The LIST option of the ANALYSIS menu will write an ASCII file containing the identification and performance fields of the selected (and possibly sorted) inspection records (sample Figure A-7). The options for LIST are:

> TITLE  SAVE  QUIT

LIST performs in the same manner as described in section 4.1.3. Use LIST to record the subset of inspection records that you have chosen.

***4.2.5  RESULTS:***  The RESULTS option calculates the data analysis tables for the set of chosen inspection records and allows further examination of their detected defects and performance. RESULTS compiles these figures and presents the following menu of options:

> REVIEW  VIEW  LIST  EXAMINE  QUIT

**4.2.5.1  REVIEW:**  REVIEW allows you to examine the data analysis results, using the cursor control keys to move between the inspection performance report totals and averages, and the tables of defect totals, averages, percentages, and relative percentages.

Data may not be entered or changed while in REVIEW mode. To exit from REVIEW and to return to the RESULTS menu, depress the Enter key with no-data.

**4.2.5.2  VIEW:**  VIEW will allow you to scan the selected inspection records in workbase that have been analyzed. VIEW will not permit the entry or modification of data. To exit VIEW and to return to the RESULTS menu, depress the Enter key with no-data.

**4.2.5.3  LIST:**  LIST writes an ASCII file of the results for the chosen set of inspections. It includes the inspection totals, averages, and defect tables. See sample Figure A-8 for an example. The options for LIST are:

> TITLE  SAVE  QUIT

LIST performs in the same manner as described in section 4.1.3.

**4.2.5.4  EXAMINE options:**  The EXAMINE menu provides four options (other than QUIT). The first three prepare graphs of the percentage of defects by their type, class, and severity. The fourth option, PERFORMANCE, analyzes the inspections with respect to their major defect density, examination rate, preparation rate, and size.

> TYPE  CLASS  SEVERITY  PERFORMANCE  QUIT

- TYPE: prepares a histogram of the percentage of defects by defect type for major defects, minor defects, and all defects.
- CLASS: prepares a histogram of the percentage of defects by defect class, (missing, wrong, and extra), for major defects, minor defects, and all defects.
- SEVERITY: prepares a histogram of the percentage of defects by major and minor severity for total, missing, wrong, and extra, defects.
- PERFORMANCE: presents a menu of options to choose graphs of the inspection performance factors.
- QUIT: Returns to the previous menu.

**4.2.5.4.1  Graph options:**   When the TYPE, CLASS, or SEVERITY graph option is selected, the appropriate bar graph will be displayed on the monitor (see sample Figures A-10 thru A-12). Depressing any key will present the following options menu:

| DISPLAY  TITLE  COPY  QUIT |

- DISPLAY will display the graph full screen
- TITLE will allow you to specify the second title line of the graph. End your title with the Enter key, and then use the DISPLAY option to re-display the graph with the title.
- COPY will copy the graph to the windows clipboard. Use QUIT to return to the previous menu, and then use the Escape key to exit LIDS.  At this time you can paste-special a picture of the graph into your application program, such as MS Word, to add the graph to your inspection performance report. Restart LIDS using Ctl-M or Ctl-X. Ctl-X  (or Ctl-D or Ctl-S as appropriate) will preserve the selected set of inspections.
- QUIT will return to the previous menu.

**4.2.5.4.2  PERFORMANCE options:**  The  PERFORMANCE  menu  provides  six  choices  for scatter plots of the inspection major defect density, size, examination rate, and preparation rate, including a plot of the quadratic regression analysis of the relationships. When PERFORMANCE is selected, there will be an initial delay while the regression analysis is computed.

   Note: PERFORMANCE will not operate for less than 4 inspection records, and an error message indicating the condition and asking for RE-SELECT will be displayed.

   The PERFORMANCE menu is:

| 1:DEF/EXM  2:DEF/SIZ  3:DEF/PRP  4:EXM/SIZ  5:EXM/PRP    6:PRP/SIZ  QUIT |

- 1:DEF/EXM: Graphs major defect density vs. examination rate.
- 2:DEF/SIZ: Graphs major defect density vs. work product size.
- 3:DEF/PRP: Graphs major defect density vs. preparation rate.
- 4:EXM/SIZ: Graphs examination rate vs. work product size.
- 5:EXM/PRP: Graphs examination rate vs. preparation rate.
- 6:PRP/SIZ: Graphs preparation rate vs. work product size.
- QUIT: will return to the preceding menu.   For  each  of  these  options,  except

QUIT, the graph will be displayed on the monitor. See sample Figure A-13. Depressing any key will erase the graph and the following options menu will be presented:

| DISPLAY  TITLE  COPY  QUIT |

   These graph options operate in the same way as described in section 4.2.5.4.1.

**4.2.6  EVALUATE:**  The EVALUATE option of the ANALYSIS menu graphically compares the distribution of the major defect densities, sizes, examination rates, and preparation rates with statistical limits for the selected inspections. This differs from the RESULTS option, which compares these same inspection parameters with each other. EVALUATE is

mostly used to assess the quality of the product, whereas RESULTS primarily looks at the performance of the inspection process. The EVALUATE menu is:

| CONTROL   DISPERSION   QUIT |

QUIT, of course, returns you to the previous menu.

**4.2.6.1  CONTROL:**  Performs a graphical comparison of the major defect density of the inspections with statistically determined control limits. These are the Lower Control Limit (LCL) and the Upper Control Limit (UCL). They are derived by applying statistical process control theory to the inspection defect data, and are indicators of inspections with either excessive or deficient defects. These results are helpful for evaluating the quality of the inspections, particularly when used with the dispersions of the sizes and rates of the inspections.

When CONTROL is selected, the next menu requests the mode for determining the control limits. The choice is based how you want the work product size to be used to compute the LCL and UCL:

| WEIGHTED   VARIABLE   AVERAGE   1:MAX   2:MIN   QUIT |

- WEIGHTED: the LCL is based on the maximum size of the set of inspections; the UCL on the average size of the set (this makes the LCL somewhat more stringent)
- VARIABLE: the LCL and UCL are based on the actual size of each work product in the set of inspections.
- AVERAGE: the LCL and UCL are based on the average size of the set of inspections
- 1:MAX: the LCL and UCL are based on the maximum size of the set of inspections
- 2:MIN: the LCL and UCL are based on the minimum size of the set of inspections
- QUIT: returns to the previous menu
  (note: The LCL is never taken as less than 0, and frequently is 0)

When any of these options is selected, a control graph with the major defect density of the inspections, the mean, the LCL, and the UCL will be presented. After examining the graph, depressing any key will display the following options menu:

| DISPLAY   TITLE   COPY   QUIT |

These graph options operate in the same way as described in section A.4.2.5.4.1. QUIT returns you to the CONTROL menu.

Multiple choices of the control mode from the CONTROL menu will allow you to determine the sensitivity of the control limits to the distribution of the work product sizes in the set. Using the maximum size of the set will produce the most stringent limits, while the control limits for the minimum size will be the loosest. One of these menu choices will most likely provide appropriate control limits for the set to discriminate between acceptable inspections and those requiring more attention.

The VARIABLE option provides the most accurate LCL and UCL. If the selected inspection records are sorted by ascending size, the control limits will be smoothly descending curves and be easier to read. A sample is in Figure A-14.

**4.2.6.2  DISPERSION:**  Performs a graphical comparison of the sizes, examination rates, and preparation rates of the selected set of inspections. The inspection parameter, the mean

of the set and a reference dispersion, some number of standard deviations (sigma) from the mean, are displayed. Dispersion charts are used to detect those inspections that deviate from the norm in their size or rates, The user determines how large the reference dispersion is by selecting the number of standard deviations from the next, SIGMA, menu:

| 1-SIGMA  2-SIGMA  3-SIGMA  CUSTOM  QUIT |
|---|

**4.2.6.2.1   SIGMA options:**   The choice of sigma will depend on the degree of variability of the data. Sigma is selected so that only about 20% of the inspections will exceed it. Three standard choices are provided, 1, 2 or 3 times sigma, as well the facility for setting the dispersion to a custom value between 1 and 4. If the reference dispersion is near 1-sigma, the set of inspections are fairly uniform; if the reference is closer to 4-sigma, the inspections vary widely.

Correspondence between inspections that exceeded the UCL on the control graph and have fairly normal dispersions are defect-prone candidates. Those inspections that are near or less than the LCL on the control graph and exceed the reference dispersions are potentially poorly inspected work products.

QUIT will return to the previous menu. After selecting sigma, the PARAMETER menu will be displayed offering one of the following options:

| SIZE  EXAM  PREP  QUIT |
|---|

**4.2.6.2.1.1   *PARAMETER options:***

- SIZE: Displays the dispersion of the sizes of the inspection work products, along with their mean and sigma reference
- EXAM: Displays the dispersion of the examination rates of the inspection work products, along with their mean and sigma reference
- PREP: Displays the dispersion of the preparation rates, along with their mean and sigma reference
- QUIT: Returns to the previous menu

When any of these options is selected, the Display options menu will be presented. Choosing DISPLAY shows a graph with the inspection parameter, the mean, and the upper and lower (never less than 0) sigma reference dispersions will be presented. See Figures A-15 thru A-17 for samples. After examining the graph, depressing any key will display the following options menu again:

| DISPLAY  TITLE  COPY  QUIT |
|---|

These graph options operate in the same way as described in section A.4.2.5.4.1, with one addition: after using COPY for a sequence of dispersions,  use Ctl-S to restart LIDS at the DISPERSION TYPE menu, preserving the current setting of Sigma. QUIT returns you to the DISPERSION TYPE menu.

**4.2.7   *QUIT***   The QUIT option on the first ANALYSIS menu, will return you to the initial LIDS menu.

### 4.3  MAINT

LIDS inspection data maintenance is performed on either a record or on the database. Record oriented (SELECT) maintenance is available for changes to all inspection identification, performance, and defect data, and is the only method provided for deletion of an inspection record from the database. Maintenance of the database (OPEN) is most convenient for changes that effect more than one record, and which deal only with inspection identification fields, not performance or defect data.

The MAINTenance menu has the following options:

VIEW  SELECT  OPEN  LIST  QUIT

The usual sequence of these options is to first VIEW the inspection database in order to identify the desired record or fields to be changed. Then choose the appropriate maintenance mode, SELECT or OPEN, to update the record or records, or the database. Document the changes through LIST.

***4.3.1  VIEW:***  VIEW provides a general facility for the LIDS user to scan the entire inspection database. The database field names appear as a fixed upper margin, and the inspection record names as a fixed left margin. The cursor control keys, including paging, may be used to display any inspection record and field, but the cursor will not enter either the upper or left margins. Data can not be changed when VIEW is active.

The Lotus row numbers appear in the leftmost border of the display. The row number is used to identify an inspection record for subsequent maintenance. When the desired inspection record is found, the row number should be recorded for use with the SELECT option. An incorrect row number will select an unintended inspection record for maintenance. LIDS will verify that the SELECTed row number is within the valid database range, and will request another SELECTion if the row number is invalid.

To exit VIEW and return to the MAINT menu, key Enter with no-data.

***4.3.2  SELECT:***  When the SELECT option is chosen, you are requested to enter the row number for the desired inspection record. Do not use a row number lower than that for the first data base record. LIDS will validate the record row number, and will request that you make another selection if it is lower than the allowed range. Just press Enter and re-select. If the row number exceeds the database range, zeros will appear in the entry area, QUIT and re-select. After the inspection record number is entered, there will be a delay while the data is copied into the entry area and re-calculated.

SELECT will then offer the following options:

REVIEW  UPDATE  DELETE  LIST  QUIT

**4.3.2.1  REVIEW:**  REVIEW allows you to view the selected record. The cursor control keys are used to scan the data fields. No data should be entered while REVIEW is active. Enter no-data to exit and return to the SELECT menu.

**4.3.2.2  UPDATE:**  UPDATE positions the cursor to the first data entry cell of the entry area and allows data to be entered. The cursor movement keys may be used to move to any data cells in any sequence. A data field may be cleared by replacing its contents with blank. When all of the intended changes have been made, depressing Enter with no-data will

re-calculate the inspection record and exit UPDATE. LIDS will then request permission to save the updated record:

    | CANCEL  SAVE |

- CANCEL: permission is denied to save the updated record. LIDS will return to the SELECT options menu.
- SAVE: permission is given to save the updated record. The contents of the data entry area will replace the record in the database. LIDS will then return to the SELECT options menu.

**4.3.2.3  DELETE:**  DELETE will remove the selected record from the data base. Confirmation is requested before the record is deleted, as:

    | NO  YES |

If permission to delete is denied, no action is taken and LIDS will return to the SELECT options menu. Upon confirmation, the record is removed from the database, the data entry area is cleared and LIDS will return to the MAINT menu.

We suggest listing a record before either update or deletion. The listed copy may be the only convenient backup if an error is made updating data, or if the wrong record is deleted.

**4.3.2.4  LIST:**  LIST will write an ASCII copy of the inspection record to disk in the data entry format (see sample report in Figure A-6). The LIST menu offers the options:

    | TITLE  SAVE  QUIT |

LIST operates the same way as described in section A.4.3.1, and will return to the SELECT menu when completed.

**4.3.2.5  QUIT:**  QUIT for the SELECT menu will return to the MAINT menu.

**4.3.3  OPEN:**  In OPEN mode, the identification data of the records in the inspection database are available for update. When OPEN is selected, the cursor is placed on the first field of the first database record. The cursor may be moved throughout the identification section of the database using the cursor directional keys. Updates are performed by placing the cursor over the desired field, keying the replacement data, and depressing the Enter key. Alternatively, the Lotus Edit mode (keying F2) may be used. See the Lotus manual for more details in the use of the Edit (F2) key. Data may be removed by replacing the field with a blank entry.

The reason that only identification data can be altered in OPEN mode is that a change to a numeric fields that is used in computations (Lines, for example, is used in both density and rate calculations) may leave the record out of balance until (or if) it is recalculated. Therefore, performance and the defect fields are not available in OPEN update mode. Also, note that all dates are stored in Lotus internal date format, (although their display format in the database is mm/dd/yy), and will appear as a numeric value in the Lotus update window, where January 1, 1900 is 1. Updates should be made in the Lotus internal date format (e.g. 11/24/90 is 33201).

After making your changes, using the Lotus Edit key (F2) if you wish, depress the Enter key with no-data to complete OPEN update. LIDS will return to the MAINT menu.

***4.3.4  LIST:***  The LIST option for the MAINTenance menu will write an ASCII file of the identification and performance data of the LIDS database, sample Figure A-6. The LIST options menu will appear, as:

| TITLE  SAVE  QUIT |
|---|

These options operate the same as described in section A.4.3.1. LIST will return to the MAINT menu when completed.

***4.3.5  QUIT:***  QUIT will return to the initial LIDS menu.

---

## 5  Input Data Format

There are three types of inspection data that are entered into LIDS:

1. Inspection Identification
2. Inspection Performance
3. Inspection Defects

For ease of entry and recognition, all alphabetic entries should be made in upper case. Do not insert any leading or trailing blanks. The format and content of input data is determined by the project.

| INSPECTION IDENTIFICATION DATA | | |
|---|---|---|
| **Name** | **Description** | **Format / Content** |
| Insp. Date | Date of inspection | Numeric-Label / dd/mm/yy |
| Project | Development project | Alpha-Numeric |
| Release | Development release | Alpha-Numeric |
| Activity | Development activity | Alpha-Numeric |
| Document | Development document | Alpha-Numeric |
| Component | Component name | Alpha-Numeric |
| Moderator | Moderator's last name | Alpha / (I, R, O) |
| Meeting Type | Type of meeting | Alpha |
| Insp. Type | Type of inspection | Alpha / (e.g. RQ, HL, DD, CD, TP, TC, etc.) |
| Disposition | Inspection exit disposition- Must be present for meeting types I & R.- Must NOT be present for meeting type O. | Alpha / (A, C, R) A=Accept C=Conditional R=Re-Inspect |

| INSPECTION PERFORMANCE DATA | | |
|---|---|---|
| **Name** | **Description** | **Format/Content** |
| Lines | Lines of inspected documents | Numeric |
| Duration | Time for inspection meeting | Numeric / HH.h |
| Exam. Rate | Examination rate | (Computed Value) |
| Team Size | Number of team members (including author and moderator) | Numeric |
| Total Prep | Sum of team preparation time | Numeric / HHH.h |
| Defects/1000 Lines | Total defect density | (Computed Value) |
| Rework | Actual effort for rework | Numeric / HHH.h |
| Effort | Total staff hours | (Computed Value) |
| Maj/1000 Lines | Major Defect Density | (Computed Value) |
| Prep. Rate | Average preparation rate (excluding the author) | Numeric |
| Comp. Date | Completion date - including all rework | Numeric-Label / dd/mm/yy |

| INSPECTION DEFECT DATA | | |
|---|---|---|
| **Name** | **Description** | **Format** |
| inspection defects | Count of Defects per Type/Class/Severity | Numeric |

The inspection defect types are described by a two letter code as:

| DEFECT TYPES | |
|---|---|
| **Type** | **Name** |
| DA | Data |
| DC | Documentation |
| FN | Functionality |
| HF | Human Factors |
| IF | Interface |
| LO | Logic |
| MN | Maintainability |
| PF | Performance |
| ST | Standards |
| OT | Other |
| — | (expansion) |

## 6  Output Data Format

LIDS output data consists of four types of reports:

1. Data Entry/Maintenance

2. Data Analysis

3. Graphical Analysis

4. Summary of Database and Workbase records

All of these reports may be viewed on-line as well as written to an ASCII file.

### 6.1  Data Entry/Maintenance Report:

This report is an image of the LIDS on-line data entry area. All of the field definitions described in Section 5, *Input Data Format*, apply to this report.

### 6.2  Data Analysis Report:

The Data Analysis Report is generated for the subset of the inspection records that were chosen. The number of records for Inspection, Re-Inspection, and Overview meetings are reported as the count of I-Records, R-Records, and O-Records respectively. The Data Analysis Report comprises three sections: (1) Inspection Record Totals, (2) Inspection Record Averages, (3) Data Analysis Tables.

### 6.2.1  Inspection Record Totals:

| INSPECTION RECORD TOTALS | | |
|---|---|---|
| **Name** | **Description** | **Units** |
| Records | Number of inspection records analyzed for this report. | Integer |
| Total Effort | Total staff effort for inspections. Computed as: (Total Duration * Average Team Size) + Total Preparation | HHHH.(h) |
| Total Lines | Total lines inspected | Integer |
| Total Exam | Total of ALL members examination time | HHHH.(h) |
| % Exam | % of total time for examination | %% |
| Effort/1000 Lines | Effort per Lines | HHHH.(h) |
| Total Prep | Sum of Inspection Preparation Time. | HHHH.(h) |
| % Prep | Preparation as a % of Effort | %% |
| Def/1000 Lines | Density of ALL Defects | NNN.(n) |
| Total Rework | ALL Rework Effort | HHH.(h) |
| % Rwrk | % of total time for rework | %% |
| Maj/1000 Lines | Density of Major Defects; computed as: (Majors / Lines) * 1000 | NNN.(n) |
| Maj | Number of Major Defects | Integer |
| % Maj | % of Major Defects of total | %% |
| Rework/1000 Lines | Rework per 1000 Lines | HHH.(h) |
| Defects | Total of ALL defects reported | Integer |
| Rework/Def | Rework per Total Defects | HH.(h) |
| Rework/Maj | Rework per Major Defect | HH.(h) |
| I-Records R-Records O-Records | Number of records of each type present in total of selected records | NNN |

### 6.2.2  Inspection Record Averages:

| INSPECTION RECORD AVERAGES | | |
|---|---|---|
| **Name** | **Description** | **Units** |
| Duration | Average meeting time | HH.(h) |
| Effort | Average inspection effort | HHH.(h) |
| Lines | Average lines inspected | Integer |
| Team Size | Average size of inspection team. | NN.(n) |
| Defects | Average number of all defects found. | NNN.(n) |
| Effort/Defect | Effort per Total Errors | HH.(h) |
| Exam. Rate | Average Lines examined per hour. Computed as: Avg. Lines / Avg. Duration | NNNN.(n) |
| Maj | Average number of Maj errors | NNN.(n) |
| Effort/Major | Average Effort per Major Defect | HH.(h) |
| Prep. Rate | Average lines prepared per hour by each inspector. Computed as: (Avg. Lines * Team Size) / Avg. Preparation | NNN.n |
| Prep./Person | Average preparation time per inspection team member. Computed as: Tot Prep / (No. Insp * Team Size) | HHH.h |
| Effort/Person | Average effort per person. Computed as: Effort / Team Size | HHH.h |
| Rework | Average of Rework time/insp. | HH.(h) |

### *6.2.3   DATABASE & WORKBASE Fields:*

| DATABASE FIELDS | | |
|---|---|---|
| **Field** | **Definition** | **Size** |
| PROJ | Project name | 9 |
| REL | Release number | 7 |
| ACTIVITY | Product function | 6 |
| DOC | Document identification | 9 |
| COMPONENT | Component description | 24 |
| INSP-DATE | Date that the first meeting of the inspection was held (01/00/00 is an incomplete or false date) | 10 |
| MODERATOR | Name of the Moderator | 12 |
| MEET | The type of Meeting:<br> I=Inspection<br> R=Re-Inspection<br> O=Overview | 5 |
| INSP | The type of Inspection | 5 |
| DSP | The disposition decided for the verification of rework:<br>  A=Accept<br> C=Conditional<br> R=Re-Inspect | 4 |
| LINES | The total number of lines inspected at all meetings | 6 |
| DUR | Total duration of all meetings | 5 |
| TEAM | The total number of members of the inspection team - including the Moderator and Author | 5 |
| PREP | The total preparation time of all members for all meetings | 5 |
| REWRK | The time required by the Author to resolve all defects | 6 |
| EFFRT | Total effort for the Inspection for all members and for all meetings, with the Authors rework | 6 |
| EXAM. RATE | The number of lines inspected per hour | 10 |
| DEFEECTS | The total number of defects reported, regardless of severity | 7 |
| MAJ | The total number of Major defects reported | 5 |
| DENS | The total number of Major defects per 1000 lines | 6 |
| PREP. RATE | The average number of lines prepared per hour - not including the author | 10 |
| COMP-DATE | The date that the Moderator certifies completion of the Inspection (01/00/00 means an incomplete or invalid date) | 10 |

*6.2.4  Data Analysis Tables:*  There are four data analysis tables: (1) Total Defects, (2) Average Defects, (3) Percentage Defects, and (4) Relative Percentage Errors. Each analysis table uses the same format as the data entry table, and reports the inspection defects by type, class, and severity as well as by summary and grand totals for the selected records. The relative percentage table computes the percentage of each defect type with respect to the total minor defects or the total major defects, as appropriate to its category.

### 6.3  Summary of Inspection Records:

The inspection record summary report lists the identification and performance data for each record in the LIDS database, or in the working database, following your selection. The summaries are written to an ASCII file and are for reference in tracking the database contents, and for attachment to the Data Analysis Reports to identify the subset of inspection records that have been analyzed. The listing of the inspections in workbase will have a record number as the first field to identify the inspections with those on the performance and evaluation graphs.

### 6.4  Graphical Analysis Reports:

There are four types of graphs produced by LIDS:

1. Defect Analysis
2. Inspection Performance
3. Defect Control
4. Parameter Dispersion

Graphs that are produced by LIDS are copied to the Windows clipboard and may be transferred into a variety of desktop publishing, graphics, or word processing programs.

## 7  Sample Reports

### 7.1  Inspection Data Entry/Maintenance

This inspection record was written to an ASCII file using the LIST option on the ENTRY menu, and the file was then formatted with a word processor.

```
************************* INSPECTION REPORT *************************
**** SCSI open object - initial version
****                                                       04/14/98
****                                                       12:16 PM
********************************************************************

                           INSPECTION ID

                                               Insp. Date: 03/14/94

    Project:1108                  Release:NEW
   Activity:1.75               Document:1.7506
  Component:ENABLESCSIDRIVES
  Moderator:GK             Meeting Type:I
 Insp. Type:CD              Disposition:A

                    INSPECTION PERFORMANCE

      Lines:  320       Duration: 1.75         Exam. Rate:      183
  Team Size:    4      Total Prep:  4.5     Def/1000 Lines:    15.6
     Rework:    1    Total Effort: 12.5     Maj/1000 Lines:     3.1
                       Prep. Rate:  213
                     (excluding author)       Comp. Date: 03/14/94

                     INSPECTION DEFECTS

   ||         MINOR              ||        MAJOR          ||
   ||   M      W      E   || TOT || M      W      E   || TOT || TOTALS
 -----------------------------------------------------------------------
 DA||                     ||   0 ||                   ||   0 ||       0
 DC||    1          0  ||   1 ||                   ||   0 ||       1
 FN||                     ||   0 ||                   ||   0 ||       0
 HF||                     ||   0 ||                   ||   0 ||       0
 IF||                     ||   0 ||                   ||   0 ||       0
 LO||    2      1     0  ||   3 ||   1      0        ||   1 ||       4
 MN||                     ||   0 ||                   ||   0 ||       0
 PF||                     ||   0 ||                   ||   0 ||       0
 ST||               0  ||   0 ||                   ||   0 ||       0
 OT||    0          0  ||   0 ||                   ||   0 ||       0
 --||                     ||     ||                   ||     ||
 --||                     ||     ||                   ||     ||
 -----------------------------------------------------------------------
 TOT||    3      1     0  ||   4 ||   1      0      0 ||   1 ||       5
                 CATEGORY TOTALS:    4      1      0         ===========
```

*Figure A-6*

### 7.2   Selected Inspection Records

The criteria for choosing the analyzed set of inspections records was INSP=C*; REL=NEW; DENS>0.1. The selected records were then sorted into ascending SIZE order. An ASCII file was written using LIST, and the file was then formatted with a word processor.

```
********************************** SELECTED INSPECTION RECORDS ************************
**********   Inspections of new code w/defects                              *******
**********                                                   04/09/98       *******
**********                                                   01:35 PM       *******
*************************************************************************************

INSP # PROJ  REL  ACT  DOC                COMPONENT        INSP-DATE MODERATOR MEET INSP
    1 1174   NEW  1.75 1.7505 PP                           02/04/94 DH        I    CD
    2 1175   NEW  1.75 1.7505 DIAGS                        03/03/94 MS        I    CD
    3 1175   NEW  1.75 1.7504 EXPSTORAGE/FS                02/15/94 GK        I    CD
    4 1108   NEW  1.75 1.7506 ENABLESCSIDRIVES             03/14/94 GK        I    CD
    5 1147   new  1.75 1.7506 dc102/DUT                    03/09/94 de        I    CD
    6 1107   NEW  1.75 1.7509 ESSDC306IMPL                 03/30/94 GC        I    C
    7 1175   NEW  1.75 1.7509 RTOSTAR                      04/04/94 RM        I    C
    8 43225  NEW  1.75 1.7512 ACCOUNTRECORDIMPL            04/05/94 RM        I    C
    9 1171   NEW  1.75 1.7511 SECURITY TOOL PHASE 2        04/06/94 RS        I    C
   10 1107   NEW  1.75 1.7510 SCSIMGR                      04/05/94 LP        I    C
   11 1107   NEW  1.75 1.7508 FTPFILING                    03/20/94 JD        I    C

INSP # DSP LINES DUR  TEAM PREP REWRK EFFRT EXAM.RATE DEFECTS MAJ  DENS PREP.RATE COMP-DATE
    1 A      20  0.3   3  0.5   0    1.4     67        1   1  50.0      80   04/06/94
    2 CA     22  0.5   4  0.5   0    2.5     44        3   1  45.5     132   03/09/94
    3 CA     50  0.75  3  1.25       3.5     67        3   1  20.0      80   03/03/94
    4 RI    200  2     4  6     4   18.0    100       13   2  10.0     100   03/02/94
    5 A     320  1.75  4  4.5   1   12.5    183        5   1   3.1     213   03/14/94
    6 R     450  3     4  3.5       15.5    150       31  15  33.3     386   04/06/94
    7 C     465  2     4  4     1   13.0    233       10   4   8.6     349   03/20/94
    8 RI    560  4     6  6.25  6   36.3    140       24  17  30.4     448   02/07/94
    9 A     600  1.25  4  3.5   1    9.5    480        8   4   6.7     514   03/30/94
   10 A    1600  3.5   3  7     0   17.5    457       26   1   0.6     457   04/06/94
   11 R    2000  4     3  4    16   32.0    500      106  18   9.0    1000   04/07/94
```

**Figure A-7**

```
******************************** SELECTED INSPECTION RECORDS *****************
********   Inspections of new code w/defects                        ******
********                                               04/09/98  ******
********                                               01:35 PM  ******
*****************************************************************************
```

| INSP # | PROJ | REL | ACT | DOC | COMPONENT | INSP-DATE | MODERATOR | MEET | INSP |
|--------|------|-----|------|--------|----------------------|----------|-----------|------|------|
| 1 | 1174 | NEW | 1.75 | 1.7505 | PP | 02/04/94 | DH | I | CD |
| 2 | 1175 | NEW | 1.75 | 1.7505 | DIAGS | 03/03/94 | MS | I | CD |
| 3 | 1175 | NEW | 1.75 | 1.7504 | EXPSTORAGE/FS | 02/15/94 | GK | I | CD |
| 4 | 1108 | NEW | 1.75 | 1.7506 | ENABLESCSIDRIVES | 03/14/94 | GK | I | CD |
| 5 | 1147 | new | 1.75 | 1.7506 | dc102/DUT | 03/09/94 | de | I | CD |
| 6 | 1107 | NEW | 1.75 | 1.7509 | ESSDC306IMPL | 03/30/94 | GC | I | C |
| 7 | 1175 | NEW | 1.75 | 1.7509 | RTOSTAR | 04/04/94 | RM | I | C |
| 8 | 43225 | NEW | 1.75 | 1.7512 | ACCOUNTRECORDIMPL | 04/05/94 | RM | I | C |
| 9 | 1171 | NEW | 1.75 | 1.7511 | SECURITY TOOL PHASE 2 | 04/06/94 | RS | I | C |
| 10 | 1107 | NEW | 1.75 | 1.7510 | SCSIMGR | 04/05/94 | LP | I | C |
| 11 | 1107 | NEW | 1.75 | 1.7508 | FTPFILING | 03/20/94 | JD | I | C |

| INSP # | DSP | LINES | DUR | TEAM | PREP | REWRK | EFFRT | EXAM.RATE | DEFECTS | MAJ | DENS | PREP.RATE | COMP-DATE |
|--------|-----|-------|------|------|------|-------|-------|-----------|---------|-----|------|-----------|-----------|
| 1 | A | 20 | 0.3 | 3 | 0.5 | 0 | 1.4 | 67 | 1 | 1 | 50.0 | 80 | 04/06/94 |
| 2 | CA | 22 | 0.5 | 4 | 0.5 | 0 | 2.5 | 44 | 3 | 1 | 45.5 | 132 | 03/09/94 |
| 3 | CA | 50 | 0.75 | 3 | 1.25 | | 3.5 | 67 | 3 | 1 | 20.0 | 80 | 03/03/94 |
| 4 | RI | 200 | 2 | 4 | 6 | 4 | 18.0 | 100 | 13 | 2 | 10.0 | 100 | 03/02/94 |
| 5 | A | 320 | 1.75 | 4 | 4.5 | 1 | 12.5 | 183 | 5 | 1 | 3.1 | 213 | 03/14/94 |
| 6 | R | 450 | 3 | 4 | 3.5 | | 15.5 | 150 | 31 | 15 | 33.3 | 386 | 04/06/94 |
| 7 | C | 465 | 2 | 4 | 4 | 1 | 13.0 | 233 | 10 | 4 | 8.6 | 349 | 03/20/94 |
| 8 | RI | 560 | 4 | 6 | 6.25 | 6 | 36.3 | 140 | 24 | 17 | 30.4 | 448 | 02/07/94 |
| 9 | A | 600 | 1.25 | 4 | 3.5 | 1 | 9.5 | 480 | 8 | 4 | 6.7 | 514 | 03/30/94 |
| 10 | A | 1600 | 3.5 | 3 | 7 | 0 | 17.5 | 457 | 26 | 1 | 0.6 | 457 | 04/06/94 |
| 11 | R | 2000 | 4 | 3 | 4 | 16 | 32.0 | 500 | 106 | 18 | 9.0 | 1000 | 04/07/94 |

*Figure A-7*

### 7.3  Inspection Data Analysis Report

This report was prepared for the set of "code" inspection records that were selected from the ANALYSIS menu. The LIST option of the RESULTS menu prepared an ASCII file, which was then formatted with a word processor.

```
********************** INSPECTION DATA ANALYSIS REPORT ***************
**** Inspections of new code w/defects
****                                                        04/23/98
****                                                        10:35 AM
**********************************************************************
********************** INSPECTION RECORD TOTALS *********************

   Records:   11   Total Effort:  162          Total Lines:     6287
Total Exam:   88          % Exam:  54%    Effort/1000 Lines:     25.7
Total Prep:   41          % Prep:  25%       Def/1000 Lines:     36.6
Total Rwrk:   29          % Rwrk:  18%       Maj/1000 Lines:     10.3
       Maj:   65           % Maj:  28%    Rework/1000 Lines:      4.6
   Defects:  230      Rework/Def:  0.1
                      Rework/Maj:  0.4


 I-Records:   11      R-Records:    0            O-Records:        0

********************** INSPECTION RECORD AVERAGES *******************

  Duration:  2.1          Effort: 14.7               Lines:      572
 Team Size:  3.8         Defects: 20.9       Effort/Defect:      0.7
Exam. Rate:  273             Maj:  5.9          Effort/Maj:      2.5
Prep. Rate:  432     Prep/Person:  1.3       Effort/Person:      3.8
                          Rework:  2.6


************************ DEFECT ANALYSIS TABLES *********************
        ********** TOTAL INSPECTION DEFECTS **********
   ||          MINOR            ||          MAJOR            ||
   || M     W     E  || TOT ||  M     W     E  || TOT  || TOTALS
---------------------------------------------------------------------
DA||    1     0     3 ||    4 ||   2     2     1 ||    5 ||      9
DC||   22     0     1 ||   23 ||   0     0     0 ||    0 ||     23
FN||    0     1     0 ||    1 ||   0     1     0 ||    1 ||      2
HF||    0     0     0 ||    0 ||   1     1     0 ||    2 ||      2
IF||    3     0     0 ||    3 ||   0     0     0 ||    0 ||      3
LO||   65    21    31 ||  117 ||  30    26     1 ||   57 ||    174
MN||    4     5     1 ||   10 ||   0     0     0 ||    0 ||     10
PF||    0     0     0 ||    0 ||   0     0     0 ||    0 ||      0
ST||    0     0     0 ||    0 ||   0     0     0 ||    0 ||      0
OT||    4     1     2 ||    7 ||   0     0     0 ||    0 ||      7
--||                   ||      ||                 ||      ||
--||                   ||      ||                 ||      ||
---------------------------------------------------------------------
TOT||  99    28    38 ||  165 ||  33    30     2 ||   65 ||    230
            CATEGORY TOTALS:  132    58    40          ===========
```

*Figure A-8*

```
        ********** AVERAGE INSPECTION DEFECTS **********
   ||       MINOR          ||        MAJOR            ||
   ||   M     W     E   || TOT  ||  M     W     E   || TOT  || TOTALS
  ---------------------------------------------------------------------
  DA||   0.1   0.0   0.3 ||  0.4 || 0.2   0.2   0.1 ||  0.5 ||     0.8
  DC||   2.0   0.0   0.1 ||  2.1 || 0.0   0.0   0.0 ||  0.0 ||     2.1
  FN||   0.0   0.1   0.0 ||  0.1 || 0.0   0.1   0.0 ||  0.1 ||     0.2
  HF||   0.0   0.0   0.0 ||  0.0 || 0.1   0.1   0.0 ||  0.2 ||     0.2
  IF||   0.3   0.0   0.0 ||  0.3 || 0.0   0.0   0.0 ||  0.0 ||     0.3
  LO||   5.9   1.9   2.8 || 10.6 || 2.7   2.4   0.1 ||  5.2 ||    15.8
  MN||   0.4   0.5   0.1 ||  0.9 || 0.0   0.0   0.0 ||  0.0 ||     0.9
  PF||   0.0   0.0   0.0 ||  0.0 || 0.0   0.0   0.0 ||  0.0 ||     0.0
  ST||   0.0   0.0   0.0 ||  0.0 || 0.0   0.0   0.0 ||  0.0 ||     0.0
  OT||   0.4   0.1   0.2 ||  0.6 || 0.0   0.0   0.0 ||  0.0 ||     0.6
  --||                   ||      ||                 ||      ||
  --||                   ||      ||                 ||      ||
  ---------------------------------------------------------------------
  TOT||  9.0   2.5   3.5 || 15.0 || 3.0   2.7   0.2 ||  5.9 ||    20.9
                CATEGORY TOTALS: 12.0   5.3   3.6        ==========

        ********** TOTAL PERCENTAGE DEFECTS **********

   ||       MINOR          ||        MAJOR            ||
   ||   M     W     E   || TOT  ||  M     W     E   || TOT  || TOTALS
  ---------------------------------------------------------------------
  DA||   0.4%  0.0%  1.3% ||  1.7% || 0.9%  0.9%  0.4% ||  2.2% ||    3.9%
  DC||   9.6%  0.0%  0.4% || 10.0% || 0.0%  0.0%  0.0% ||  0.0% ||   10.0%
  FN||   0.0%  0.4%  0.0% ||  0.4% || 0.0%  0.4%  0.0% ||  0.4% ||    0.9%
  HF||   0.0%  0.0%  0.0% ||  0.0% || 0.4%  0.4%  0.0% ||  0.9% ||    0.9%
  IF||   1.3%  0.0%  0.0% ||  1.3% || 0.0%  0.0%  0.0% ||  0.0% ||    1.3%
  LO||  28.3%  9.1% 13.5% || 50.9% ||13.0% 11.3%  0.4% || 24.8% ||   75.7%
  MN||   1.7%  2.2%  0.4% ||  4.3% || 0.0%  0.0%  0.0% ||  0.0% ||    4.3%
  PF||   0.0%  0.0%  0.0% ||  0.0% || 0.0%  0.0%  0.0% ||  0.0% ||    0.0%
  ST||   0.0%  0.0%  0.0% ||  0.0% || 0.0%  0.0%  0.0% ||  0.0% ||    0.0%
  OT||   1.7%  0.4%  0.9% ||  3.0% || 0.0%  0.0%  0.0% ||  0.0% ||    3.0%
  --||                    ||       ||                  ||       ||
  --||                    ||       ||                  ||       ||
  ---------------------------------------------------------------------
  TOT|| 43.0% 12.2% 16.5% || 71.7% ||14.3% 13.0%  0.9% || 28.3% ||  100.0%
                CATEGORY TOTALS: 57.4% 25.2% 17.4%        ==========

        ********** RELATIVE PERCENTAGE DEFECTS **********

   ||       MINOR          ||        MAJOR           |      ||
   ||   M     W     E   || TOT  ||  M     W     E   || TOT  ||
  ---------------------------------------------------------------
  DA||   0.6%  0.0%  1.8% ||  2.4% || 3.1%  3.1%  1.5% ||  7.7% ||
  DC||  13.3%  0.0%  0.6% || 13.9% || 0.0%  0.0%  0.0% ||  0.0% ||
  FN||   0.0%  0.6%  0.0% ||  0.6% || 0.0%  1.5%  0.0% ||  1.5% ||
  HF||   0.0%  0.0%  0.0% ||  0.0% || 1.5%  1.5%  0.0% ||  3.1% ||
  IF||   1.8%  0.0%  0.0% ||  1.8% || 0.0%  0.0%  0.0% ||  0.0% ||
  LO||  39.4% 12.7% 18.8% || 70.9% ||46.2% 40.0%  1.5% || 87.7% ||
  MN||   2.4%  3.0%  0.6% ||  6.1% || 0.0%  0.0%  0.0% ||  0.0% ||
  PF||   0.0%  0.0%  0.0% ||  0.0% || 0.0%  0.0%  0.0% ||  0.0% ||
  ST||   0.0%  0.0%  0.0% ||  0.0% || 0.0%  0.0%  0.0% ||  0.0% ||
  OT||   2.4%  0.6%  1.2% ||  4.2% || 0.0%  0.0%  0.0% ||  0.0% ||
  --||                    ||       ||                  ||       ||
  --||                    ||       ||                  ||       ||
  ---------------------------------------------------------------
  TOT|| 60.0% 17.0% 23.0% ||100.0% ||50.8% 46.2%  3.1% ||100.0% ||
```

*Figure A-8 (continued)*

### 7.4  Inspection Database Records

25 of 81 inspection records in the database are listed. The listing was prepared from an ASCII file written by the LIST option of the MAINTenance menu. The file was then formatted with a word processor.

```
************************ INSPECTION DATABASE RECORDS *******************************
*********  First 25 of 80 inspections in database          *******
*********                                        04/14/98  *******
*********                                        12:19 PM  *******
**********************************************************************************
```

| PROJ | REL | ACT | DOC | COMPONENT | INSP-DATE | MODERATOR | MEET | INSP | DSP |
|---|---|---|---|---|---|---|---|---|---|
| 92292 | Fix | 1.75 | 1.7503 | PROG/DISP FUNCTION KEYS | 02/01/94 | JA | I | CD | A |
| 81022 | Fix | 1.75 | 1.7503 | TRANSLATION TYPE 1 | 02/04/94 | JA | I | CD | C |
| 114771 | NEW | 1.75 | 1.7503 | TRANSLATION TYPE 3 | 02/02/94 | JM | I | CD | A |
| 114807 | FIX | 1.75 | 1.7503 | PROG/DISP FUNCTION KEYS | 02/03/94 | JM | I | CD | A |
| 114401 | FIX | 1.75 | 1.7503 | STATUS PART 1 | 02/03/94 | BM | I | CD | A |
| 114812 | FIX | 1.75 | 1.7503 | TRANSLATION TYPE 2 | 02/03/94 | BM | I | CD | A |
| 114813 | FIX | 1.75 | 1.7503 | OPS | 02/03/94 | BM | I | CD | A |
| 114776 | NEW | 1.75 | 1.7503 | LCD INDICATORS - SERVICE | 02/02/94 | JM | I | CD | A |
| 1175 | NEW | 1.75 | 1.7503 | STATUS BUS | 02/02/94 | JM | I | CD | A |
| 760308 | FIX | 1.75 | 1.7504 | LCD INDICATORS | 02/15/94 | CW | I | CD | A |
| 760305 | FIX | 1.75 | 1.7504 | OPS | 02/15/94 | CW | I | CD | CA |
| 114800 | FIX | 1.75 | 1.7504 | STATUS DMA | 02/17/94 | HMB | I | CD | A |
| 114799 | FIX | 1.75 | 1.7504 | LCD INDICATORS - USER | 02/17/94 | HMB | I | CD | A |
| 114780 | FIX | 1.75 | 1.7504 | STATUS CHANNEL | 02/17/94 | HMB | I | CD | A |
| 1184 | NEW | 1.75 | 1.7504 | CALL WAITING DISPLAY | 02/17/94 | HMB | I | CD | CA |
| 114814 | FIX | 1.75 | 1.7504 | CALL ACTIVE DISPLAY | 02/17/94 | HMB | I | CD | CA |
| 114779 | FIX | 1.75 | 1.7504 | STATUS CHANNEL | 02/17/94 | HMB | I | CD | A |
| 114784 | FIX | 1.75 | 1.7504 | TRANSLATION TYPE 4 | 02/17/94 | HMB | I | CD | A |
| 1184 | NEW | 1.75 | 1.7504 | AUDIBLE ALERTING | 02/17/94 | HMB | I | CD | A |
| 114781 | FIX | 1.75 | 1.7504 | KEY HANDLER AND DND | 02/17/94 | HMB | I | CD | CA |
| 1174 | NEW | 1.75 | 1.7505 | DIAL_0 AND LDN | 02/01/94 | DH | O | CCD | A |
| 1174 | NEW | 1.75 | 1.7505 | DIRECTED RECALL/COS | 02/04/94 | DH | I | CD | RI |
| 10807 | FIX | 1.75 | 1.7505 | KEY HANDLER | 02/23/94 | LB | I | CD | A |
| 1152 | NEW | 1.75 | 1.7505 | AUDIBLE ALERTING/CON | 02/23/94 | LB | I | CD | A |
| 146105 | NEW | 1.75 | 1.7504 | DO NOT DISTURB | 02/18/94 | LB | I | CD | A |

**Figure A-9**

```
******************************* INSPECTION DATABASE RECORDS **************************
******** First 25 of 80 inspections in database                            ******
********                                                          04/14/98  ******
********                                                          12:19 PM  ******
*************************************************************************************
PROJ        REL     ACT     DOC         COMPONENT           INSP-DATE MODERATOR MEET INSP DSP
92292       Fix     1.75    1.7503  PROG/DISP FUNCTION KEYS  02/01/94 JA         I    CD   A
81022       Fix     1.75    1.7503  TRANSLATION TYPE 1       02/04/94 JA         I    CD   C
114771      NEW     1.75    1.7503  TRANSLATION TYPE 3       02/02/94 JM         I    CD   A
114807      FIX     1.75    1.7503  PROG/DISP FUNCTION KEYS  02/03/94 JM         I    CD   A
114401      FIX     1.75    1.7503  STATUS PART 1            02/03/94 BM         I    CD   A
114812      FIX     1.75    1.7503  TRANSLATION TYPE 2       02/03/94 BM         I    CD   A
114813      FIX     1.75    1.7503  OPS                      02/03/94 BM         I    CD   A
114776      NEW     1.75    1.7503  LCD INDICATORS - SERVICE 02/02/94 JM         I    CD   A
1175        NEW     1.75    1.7503  STATUS BUS               02/02/94 JM         I    CD   A
760308      FIX     1.75    1.7504  LCD INDICATORS           02/15/94 CW         I    CD   A
760305      FIX     1.75    1.7504  OPS                      02/15/94 CW         I    CD   CA
114800      FIX     1.75    1.7504  STATUS DMA               02/17/94 HMB        I    CD   A
114799      FIX     1.75    1.7504  LCD INDICATORS - USER    02/17/94 HMB        I    CD   A
114780      FIX     1.75    1.7504  STATUS CHANNEL           02/17/94 HMB        I    CD   A
1184        NEW     1.75    1.7504  CALL WAITING DISPLAY     02/17/94 HMB        I    CD   CA
114814      FIX     1.75    1.7504  CALL ACTIVE DISPLAY      02/17/94 HMB        I    CD   CA
114779      FIX     1.75    1.7504  STATUS CHANNEL           02/17/94 HMB        I    CD   A
114784      FIX     1.75    1.7504  TRANSLATION TYPE 4       02/17/94 HMB        I    CD   A
1184        NEW     1.75    1.7504  AUDIBLE ALERTING         02/17/94 HMB        I    CD   A
114781      FIX     1.75    1.7504  KEY HANDLER AND DND      02/17/94 HMB        I    CD   CA
1174        NEW     1.75    1.7505  DIAL_0 AND LDN           02/01/94 DH         O    CCD  A
1174        NEW     1.75    1.7505  DIRECTED RECALL/COS      02/04/94 DH         I    CD   RI
10807       FIX     1.75    1.7505  KEY HANDLER              02/23/94 LB         I    CD   A
1152        NEW     1.75    1.7505  AUDIBLE ALERTING/CON     02/23/94 LB         I    CD   A
146105      NEW     1.75    1.7504  DO NOT DISTURB           02/18/94 LB         I    CD   A
```

*Figure A-9*

| DSP | LINES | DUR | TEAM | PREP | REWRK | EFFRT | EXAM.RATE | DEFECTS | MAJ | DENS | PREP.RATE | COMP-DATE |
|-----|-------|------|------|------|-------|-------|-----------|---------|-----|------|-----------|-----------|
| A | 15 | 0.3 | 3 | 0.75 | 0 | 1.7 | 50 | 0 | 0 | 0.0 | 40 | ********** |
| C | 8 | 0.3 | 3 | 0.5 | 0.1 | 1.5 | 27 | 1 | 0 | 0.0 | 32 | 02/04/94 |
| A | 30 | 0.15 | 3 | 0 | 0 | 0.5 | 200 | 0 | 0 | 0.0 | 0 | 02/02/94 |
| A | 9 | 0.25 | 3 | 0.1 | 0 | 0.9 | 36 | 0 | 0 | 0.0 | 180 | 02/03/94 |
| A | 3 | 0.5 | 3 | 0.1 | 0 | 1.6 | 6 | 0 | 0 | 0.0 | 60 | 02/03/94 |
| A | 1 | 0.25 | 3 | 0.1 | 0 | 0.9 | 4 | 0 | 0 | 0.0 | 20 | 02/03/94 |
| A | 6 | 0.25 | 3 | 0.1 | 0 | 0.9 | 24 | 0 | 0 | 0.0 | 120 | 02/03/94 |
| A | 3 | 0.15 | 3 | 0 | 0 | 0.5 | 20 | 0 | 0 | 0.0 |  | 02/02/94 |
| A | 10 | 0.15 | 3 | 0 | 0 | 0.5 | 67 | 0 | 0 | 0.0 | 0 | 02/02/94 |
| A | 15 | 0.5 | 3 | 0.5 | 0 | 2.0 | 30 | 0 | 0 | 0.0 | 60 | 02/15/94 |
| CA | 200 | 0.5 | 3 | 1 | 0 | 2.5 | 400 | 2 | 0 | 0.0 | 400 | 02/15/94 |
| A | 45 | 0.5 | 3 | 0.2 | 0 | 1.7 | 90 | 0 | 0 | 0.0 | 450 | 02/17/94 |
| A | 8 | 0.4 | 3 | 0.5 | 0 | 1.7 | 20 | 0 | 0 | 0.0 | 32 | 02/19/95 |
| A | 10 | 0.4 | 3 | 0.2 | 0 | 1.4 | 25 | 0 | 0 | 0.0 | 100 | 02/17/94 |
| CA | 25 | 0.5 | 3 | 0.3 | 0 | 1.8 | 50 | 1 | 0 | 0.0 | 167 | 02/17/94 |
| CA | 15 | 0.25 | 3 | 0.25 | 0 | 1.0 | 60 | 2 | 0 | 0.0 | 120 | 02/17/94 |
| A | 3 | 0.3 | 3 | 0.3 | 0 | 1.2 | 10 | 0 | 0 | 0.0 | 20 | 02/17/94 |
| A | 20 | 0.3 | 3 | 0.3 | 0 | 1.2 | 67 | 0 | 0 | 0.0 | 133 | 02/17/94 |
| A | 52 | 0.3 | 3 | 0.3 | 0 | 1.2 | 173 | 0 | 0 | 0.0 | 347 | 02/17/94 |
| CA | 6 | 0.3 | 3 | 0.3 | 0 | 1.2 | 20 | 1 | 0 | 0.0 | 40 | 02/17/94 |
| A | 0 | 1 | 6 |  |  | 6.0 | 0 | 0 | 0 | 0.0 | 0 | 02/01/94 |
| RI | 560 | 4 | 6 | 6.25 | 6 | 36.3 | 140 | 24 | 17 | 30.4 | 448 | 02/07/94 |
| A | 4 | 0.25 | 3 | 0.3 | 0 | 1.1 | 16 | 0 | 0 | 0.0 | 27 | 02/23/94 |
| A | 17 | 0.25 | 3 | 0.5 | 0 | 1.3 | 68 | 0 | 0 | 0.0 | 68 | 02/23/94 |
| A | 36 | 0.3 | 4 | 1 | 0 | 2.2 | 120 | 0 | 0 | 0.0 | 108 | 02/18/94 |

**Figure A-9 (continued)**

| DSP | LINES | DUR | TEAM | PREP | REWRK | EFFRT | EXAM.RATE | DEFECTS | MAJ | DENS | PREP.RATE | COMP-DATE |
|-----|-------|------|------|------|-------|-------|-----------|---------|-----|------|-----------|-----------|
| A  | 15  | 0.3  | 3 | 0.75 | 0   | 1.7  | 50  | 0  | 0  | 0.0  | 40  | ********** |
| C  | 8   | 0.3  | 3 | 0.5  | 0.1 | 1.5  | 27  | 1  | 0  | 0.0  | 32  | 02/04/94 |
| A  | 30  | 0.15 | 3 | 0    | 0   | 0.5  | 200 | 0  | 0  | 0.0  | 0   | 02/02/94 |
| A  | 9   | 0.25 | 3 | 0.1  | 0   | 0.9  | 36  | 0  | 0  | 0.0  | 180 | 02/03/94 |
| A  | 3   | 0.5  | 3 | 0.1  | 0   | 1.6  | 6   | 0  | 0  | 0.0  | 60  | 02/03/94 |
| A  | 1   | 0.25 | 3 | 0.1  | 0   | 0.9  | 4   | 0  | 0  | 0.0  | 20  | 02/03/94 |
| A  | 6   | 0.25 | 3 | 0.1  | 0   | 0.9  | 24  | 0  | 0  | 0.0  | 120 | 02/03/94 |
| A  | 3   | 0.15 | 3 | 0    | 0   | 0.5  | 20  | 0  | 0  | 0.0  | 0   | 02/02/94 |
| A  | 10  | 0.15 | 3 | 0    | 0   | 0.5  | 67  | 0  | 0  | 0.0  | 0   | 02/02/94 |
| A  | 15  | 0.5  | 3 | 0.5  | 0   | 2.0  | 30  | 0  | 0  | 0.0  | 60  | 02/15/94 |
| CA | 200 | 0.5  | 3 | 1    | 0   | 2.5  | 400 | 2  | 0  | 0.0  | 400 | 02/15/94 |
| A  | 45  | 0.5  | 3 | 0.2  | 0   | 1.7  | 90  | 0  | 0  | 0.0  | 450 | 02/17/94 |
| A  | 8   | 0.4  | 3 | 0.5  | 0   | 1.7  | 20  | 0  | 0  | 0.0  | 32  | 02/19/95 |
| A  | 10  | 0.4  | 3 | 0.2  | 0   | 1.4  | 25  | 0  | 0  | 0.0  | 100 | 02/17/94 |
| CA | 25  | 0.5  | 3 | 0.3  | 0   | 1.8  | 50  | 1  | 0  | 0.0  | 167 | 02/17/94 |
| CA | 15  | 0.25 | 3 | 0.25 | 0   | 1.0  | 60  | 2  | 0  | 0.0  | 120 | 02/17/94 |
| A  | 3   | 0.3  | 3 | 0.3  | 0   | 1.2  | 10  | 0  | 0  | 0.0  | 20  | 02/17/94 |
| A  | 20  | 0.3  | 3 | 0.3  | 0   | 1.2  | 67  | 0  | 0  | 0.0  | 133 | 02/17/94 |
| A  | 52  | 0.3  | 3 | 0.3  | 0   | 1.2  | 173 | 0  | 0  | 0.0  | 347 | 02/17/94 |
| CA | 6   | 0.3  | 3 | 0.3  | 0   | 1.2  | 20  | 1  | 0  | 0.0  | 40  | 02/17/94 |
| A  | 0   | 1    | 6 |      |     | 6.0  | 0   | 0  | 0  | 0.0  | 0   | 02/01/94 |
| RI | 560 | 4    | 6 | 6.25 | 6   | 36.3 | 140 | 24 | 17 | 30.4 | 448 | 02/07/94 |
| A  | 4   | 0.25 | 3 | 0.3  | 0   | 1.1  | 16  | 0  | 0  | 0.0  | 27  | 02/23/94 |
| A  | 17  | 0.25 | 3 | 0.5  | 0   | 1.3  | 68  | 0  | 0  | 0.0  | 68  | 02/23/94 |
| A  | 36  | 0.3  | 4 | 1    | 0   | 2.2  | 120 | 0  | 0  | 0.0  | 108 | 02/18/94 |

*Figure A-9 (continued)*

### 7.5   Inspection Analysis Graphs

Eight analysis graphs will illustrate the results and the evaluation of the eleven inspections that were selected. These are:

- Defect Type
- Defect Class
- Defect Severity
- Performance (Major Defects vs. Examination Rate, one of six options)
- Statistical Process Control chart of major defects (VARIABLE option)
- Dispersion of SIZE (sigma=1 option)
- Dispersion of EXAMination rate (sigma=1 option)
- Dispersion of PREParation rate (sigma=1 option)

Each graph was titled and copied to a graphics program.
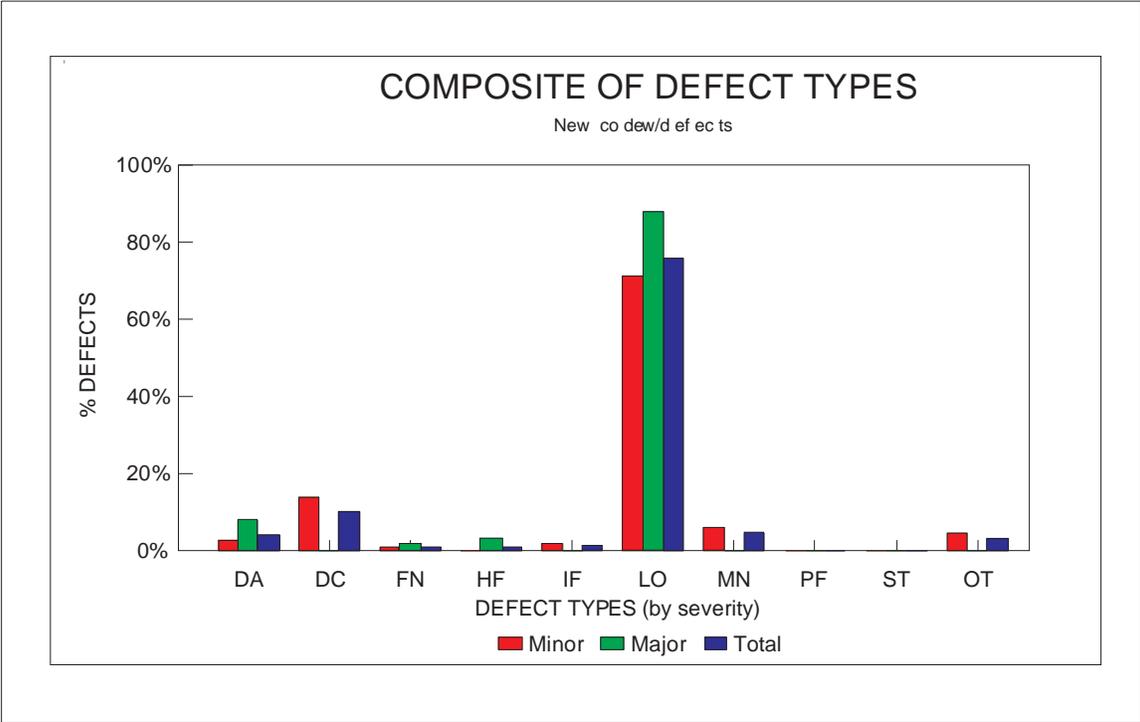


*Figure A-10*
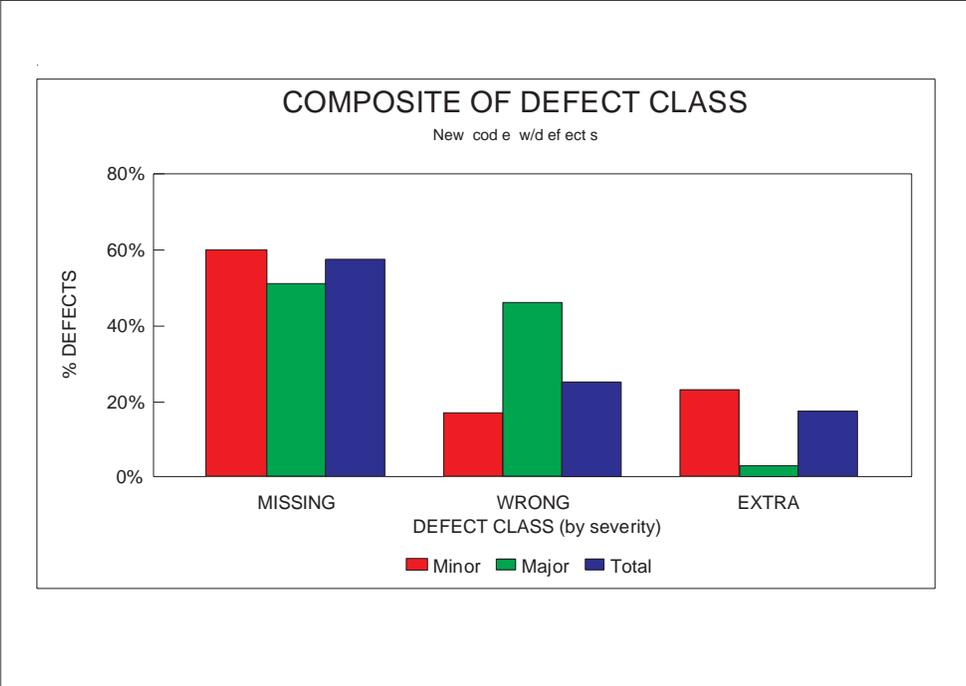
*Figure A-11*
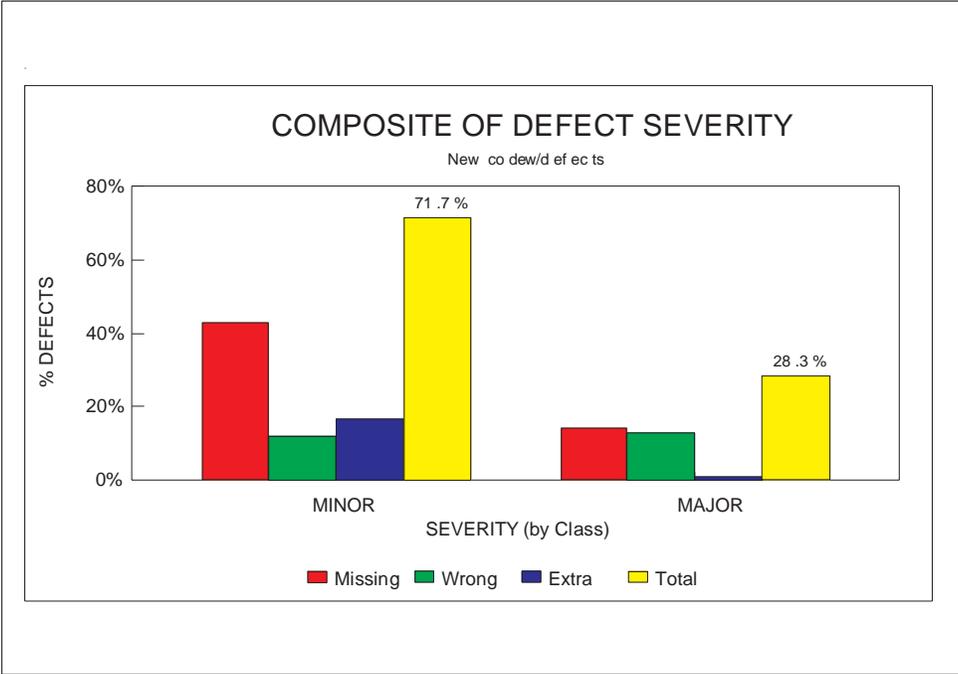


*Figure A-12*
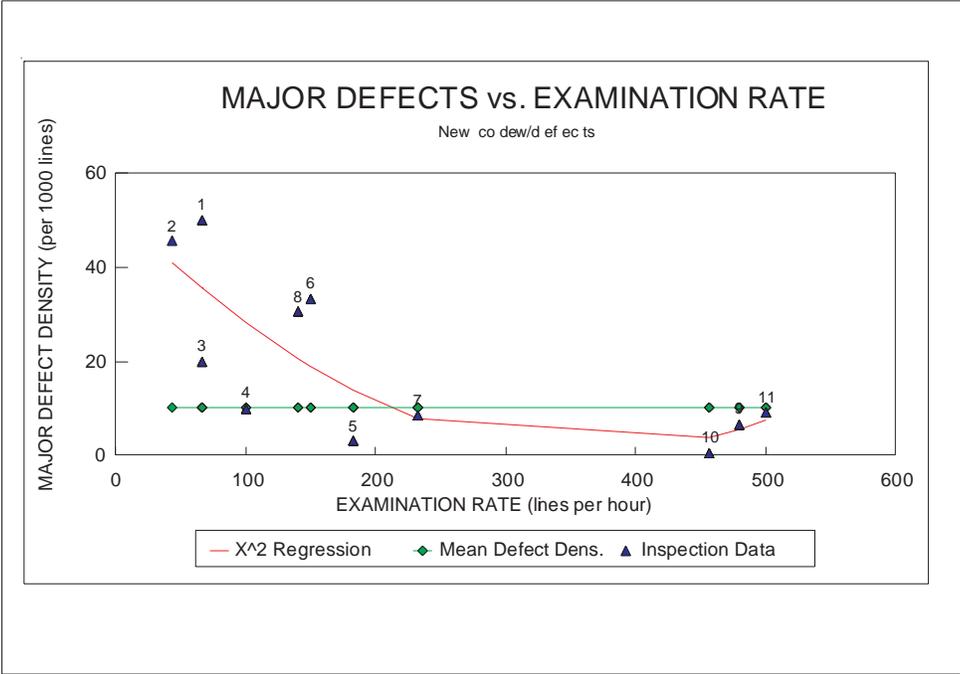
*Figure A-13*
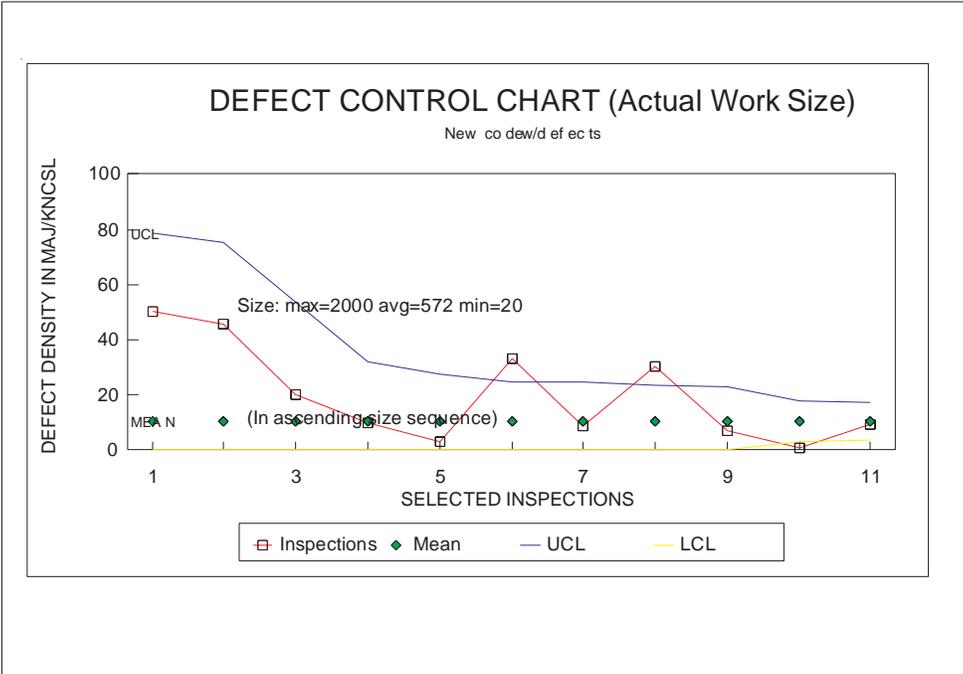


*Figure A-14*
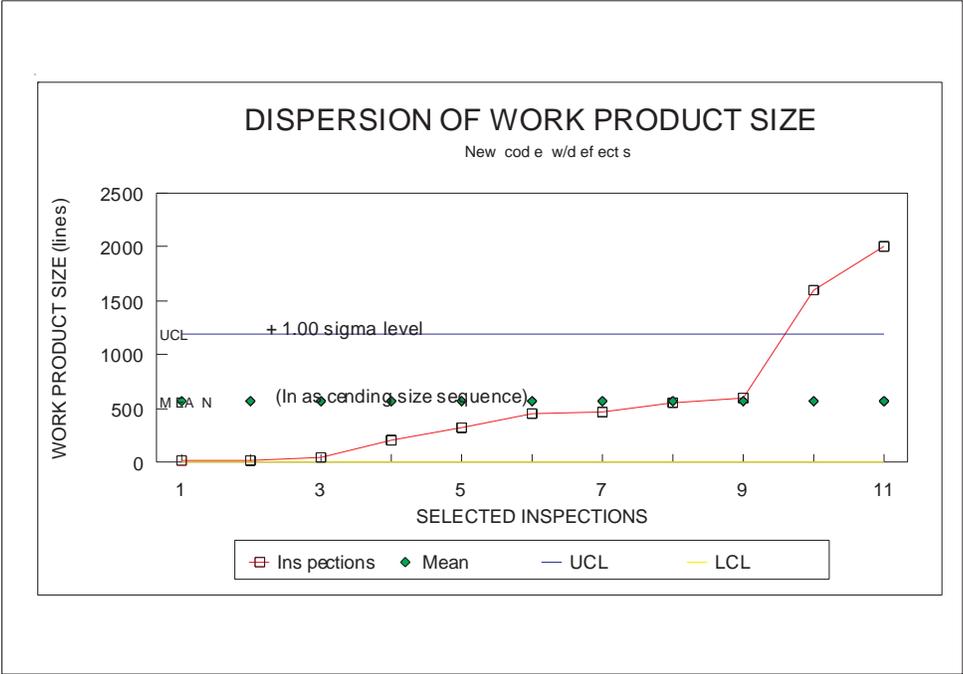
*Figure A-15*



*Figure A-16*

*Figure A-17*