PROJECT 223
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CALIFORNIA COASTAL PLATFORM

INFORMATION MANAGEMENT SYSTEM

SOFTWARE DOCUMENTATION

by

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C. William Ibbs
Robert G. Bea

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CONSTRUCTION ENGINEERING AND MANAGEMENT

UNIVERSITY OF CALIFORNIA · BERKELEY

TECHNICAL REPORT NO. 22
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- ARCO Exploration and Production
- California Coastal Commission
- California Seismic Safety Commission
- California State Lands Commission
- Chevron Oil Company
- Exxon Production & Research
- Marathon Oil Company
- Mobil Oil Company
- Nippon Steel
- Noble, Denton & Associates
- Norsk Hydro
- PMB Systems Engineering
- Shell Oil Company
- Texaco Oil Company
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Introduction

The California Coastal Platform Information Management System is a Microsoft Excel 4.0 for Windows based, IBM PC compatible, software implementation of the first level of a screening system for the reassessment and requalification of offshore platforms, such as proposed by Bea and Craig [1993] and Aggarwal [1991]. By "first level," it is meant that this program provides the basic structure for a complete Requalification Management System (RMS), including methods for the management of platform information and for the performance of Level One Structural Reliability and Consequence Assessments. More complex analyses are not included. Thus the California Coastal Platform Information Management System is more advanced than an Information Management System (IMS), but less advanced than a complete Requalification Management System (RMS). For brevity's sake, the system will be referred to in this document as "the IMS."

Development of the IMS was funded by the California Sea Grant College, the California State Lands Commission, Norsk Hydro Inc., and the U. S. Minerals Management Service. The system is intended as an advance in implementation but not in theory: existing methodologies are employed (especially Bea and Craig's Level One Structural Reliability Assessment techniques and Aggarwal's Level One Consequence Assessment techniques), and implemented in an easy-to-use software package.

The system's features can be divided into three main functions: basic platform information management operations, screening cycle operations, and graphical platform information management operations. The first item, basic platform information management operations, is described in Chapter 3 and involves the management of a database that includes such physical descriptors as platform name, location, water depth, production, etc. An unlimited number of platforms may be so described. Screening cycle operations are discussed in Chapter 4 and include structural reliability, consequence, and risk assessment procedures; multiple methods of performing the latter two are provided. Although only "Level One" screening cycle procedures are incorporated, the system is designed to be the basis for more detailed screening cycle analysis techniques as they are developed. The third item, graphical platform information management operations, is described in Chapter

5; it is primarily implemented as a means of inputting probabilistic platform environmental data through direct graphical manipulation. The operations described in Chapters 4 and 5 allow the selection of only one platform per program session.

Chapters 1 and 2 cover program installation and user familiarization. Appendix A describes system customization; Appendix B provides a table of California platform data; and Appendix C discusses advanced system set-up procedures.

Chapter 1: Software installation procedures

This document presupposes a working knowledge of Microsoft Windows and Microsoft Excel; only operations specific to the IMS will be described in this document. Both programs are required, as well as an IBM compatible personal computer. Eight megabytes of RAM, five megabytes of hard disk space, and a color monitor are recommended.

The supplied floppy disc contains one file, *CA_IMS.EXE*. When installed, the following files are produced:

SG1.xla - add-in macro file for Microsoft Excel 4.0

Build2.xls - data file for non-platform specific storage

Level1.xls - worksheet for Level 1 structural calculations

Util.xls - worksheet for utility functions

L1Conseq.xls - worksheet for Level 1 consequence assessment

L1Conse1.xls - worksheet for Level 1 consequence assessment

L1Conse2.xls - worksheet for Level 1 consequence assessment

CA_Plat1.xls - opening map of Santa Barbara Coast

DistCalc.xls - worksheet for calculating distributions

Permdata.xls - template for platform specific data storage

SG1.ico - icon for Program Manager

Logo.bmp - wallpaper file for advanced setup.

To install the program, first create a new directory for the program - for example, E:\RESEARCH\SEAGRANT or C:\SEAGRANT. Be sure to write this path down. Copy the contents of the supplied floppy disc to the directory you just created. From a DOS prompt in this directory, type `CA_IMS`. The compressed files will automatically uncompress into your directory. Delete the file *CA_IMS.EXE* from your hard disc. The uncompressed files will occupy about 2.2 MB of hard disc space.

In Windows' Program Manager, create a new group: select File, New, Program Group from the menus and click OK. When asked for a description, type `CA IMS`; when asked for a group file name, type `CAIMS` (or a name of your choice, or allow Windows to make the choice). Click OK.

Find your Excel icon one of your other Program Manager groups. Holding down the CTRL key, click on the icon and drag it to the CA IMS group. This creates a copy of the Excel icon in the CA IMS group. Making sure that this copy is still highlighted, select File, Properties from the menu. For a description, type California IMS; for the command line, type <your path, as above>\sgl.xla; and for the working directory, type <your path>. Before accepting these settings, choose the Change Icon box; for the icon's file name, enter <your path>\sgl.ico. Now choose OK for the icon, and OK for the Properties box.

A note about nomenclature:

Throughout this manual, the user will be asked to type certain keystrokes. For example, in the paragraph above, you are asked to type <your path>. This means to type in the path that you had earlier decided upon - for example, to type e:\research\seagrant if that was the path you chose. Note that actual keystrokes are denoted by a special font.

If you are asked to type TAB MMS, this means to first hit the TAB key, release it, and then type MMS. If it is intended for you to hit and hold a special key, such as CTRL, while typing something else, that intention will be made explicit.

Advanced setup

If you would like to run this program without loading all the accessories that Windows usually loads, or if your machine has less than eight megabytes of RAM, please refer to Appendix C.

Chapter 2: Starting out

Password

When the "Program Mode" dialog box appears (see Figure 1), type TAB MMS, and click OK.

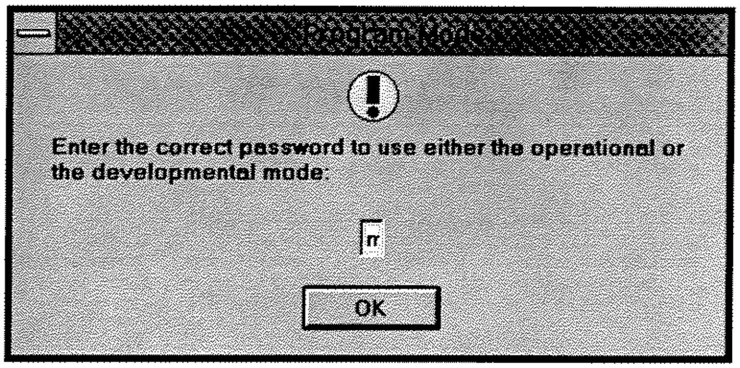

Figure 1
Password entry dialog box.

Video

When the "Video Mode" dialog box (Figure 2) appears, type 1, 2, or 3, as appropriate for your monitor (VGA, SVGA, or better). Note: the program was designed for 1024x768 pixel screens, and thus will produce the best quality graphics with the 3 setting.

If this is meant to be a permanent installation on this particular computer, check the bottom box to avoid having to re-select a monitor in the future.

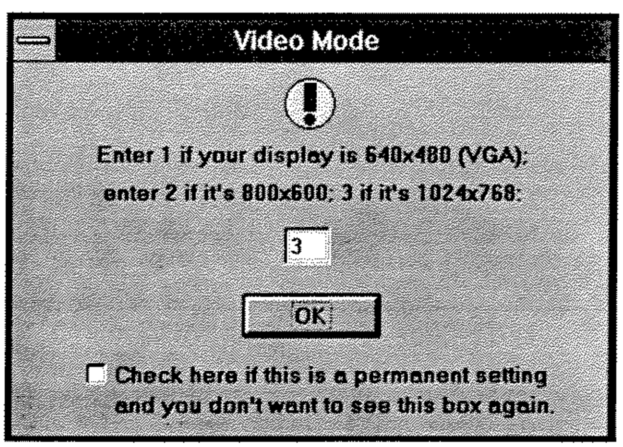

Figure 2
Video mode dialog box.

First run-through

Prior to setting up data files, the following warning will be seen upon start-up (Figure 3):

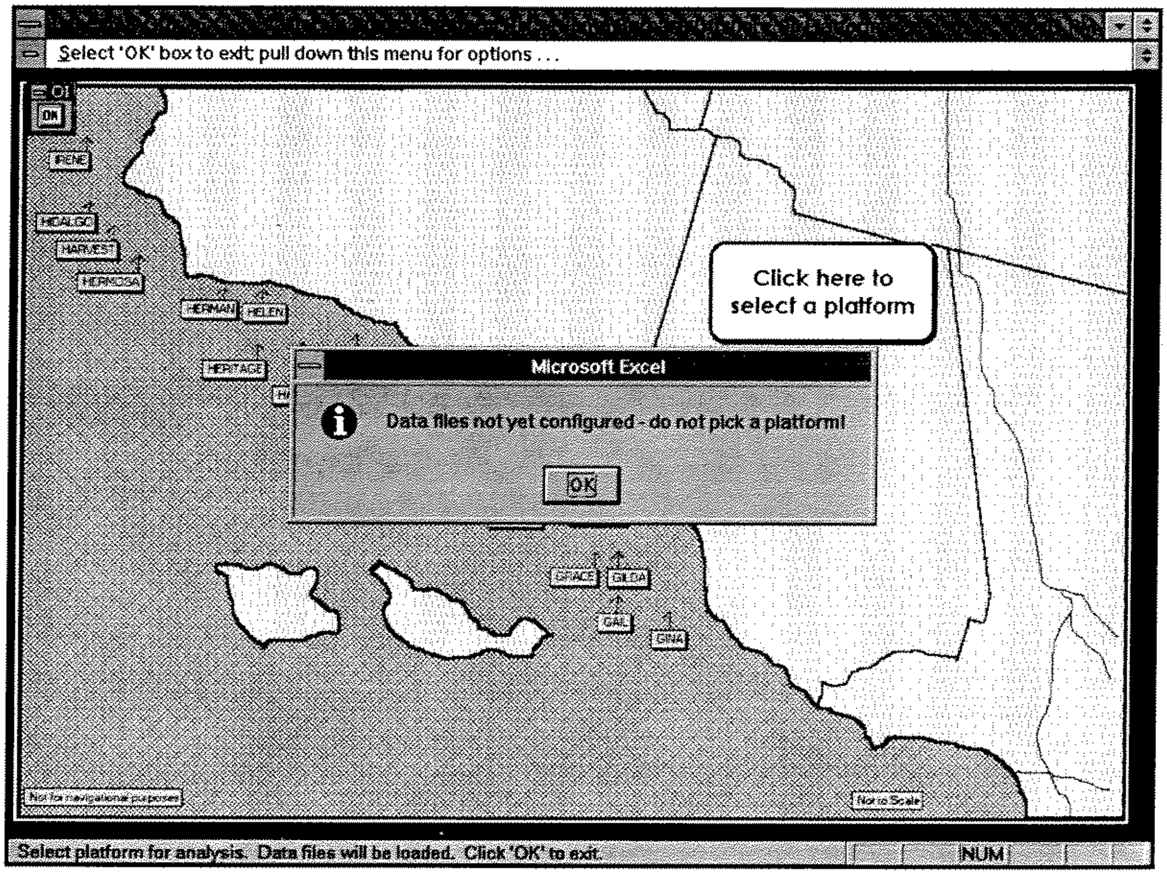

Figure 3
Pre-setup warning.

This is normal, and is meant to remind the user not to select a non-existent platform data file for analysis (either by clicking on the "Click here to select a platform" button or through the menu process).

After selecting OK to clear the warning, note that the message at the left hand of the bottom part of the display (the "status bar") indicates that the program is using platform "Template," since no platform is in use. This is appropriate. Next, move ahead either by clicking the icon in the upper left corner of the map, or by selecting "Move On" from the "Select 'OK' box to exit; pull down this menu for options . . ." menu.

After choosing to move on, the main menu will be presented (Figure 4):

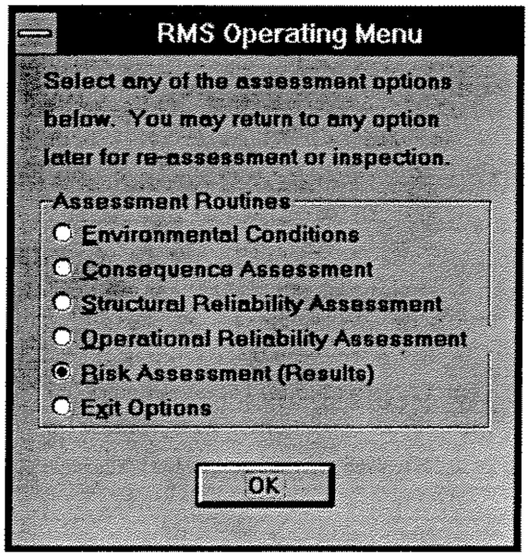

Figure 4
Operating menu.

Double click on "Environmental Conditions" (or click once, and then hit Enter, or type Alt e Enter) to bring up the Environmental Conditions menu (Figure 5).[1] This portion of the program stores information about a structure's environment.

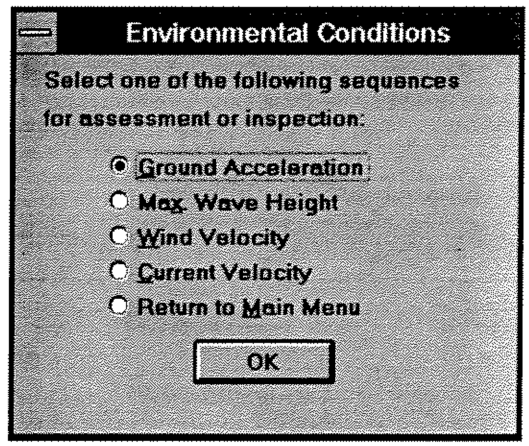

Figure 5
Environmental conditions menu.

Select "Ground Acceleration." Momentarily, the "Ground Acceleration vs. Return Period" chart will be drawn, and the following dialogue presented (Figure 6):

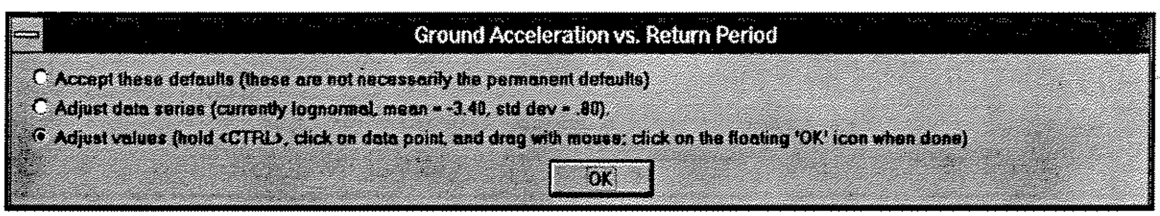

Figure 6
Ground acceleration vs. return period modification dialog.

Choose "Adjust values" (the third option) to clear the dialog box and view the chart. An Excel error message may occur during this and subsequent processes (Figure 7):

[1] Since the purpose of this exercise is to get familiar with the system, only a basic run-through of the available features will be shown in this section. Please refer to later sections of this document for system details.

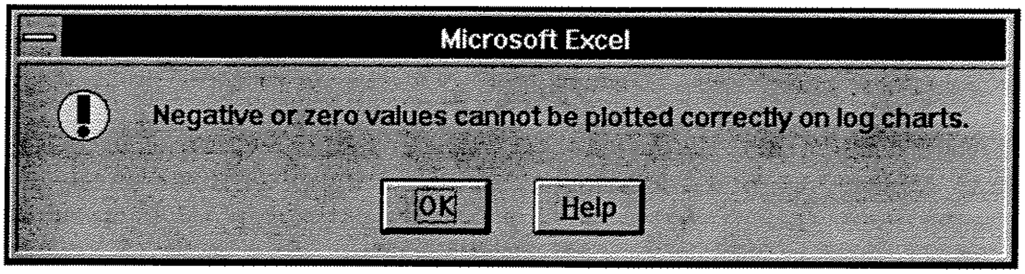

Figure 7
Log chart error message (click "OK" to ignore).

Choose "OK" to clear, and ignore, this message.

A screen similar to Figure 8 (varying slightly depending on your display type) should appear. There are several features of this chart which should be noted:

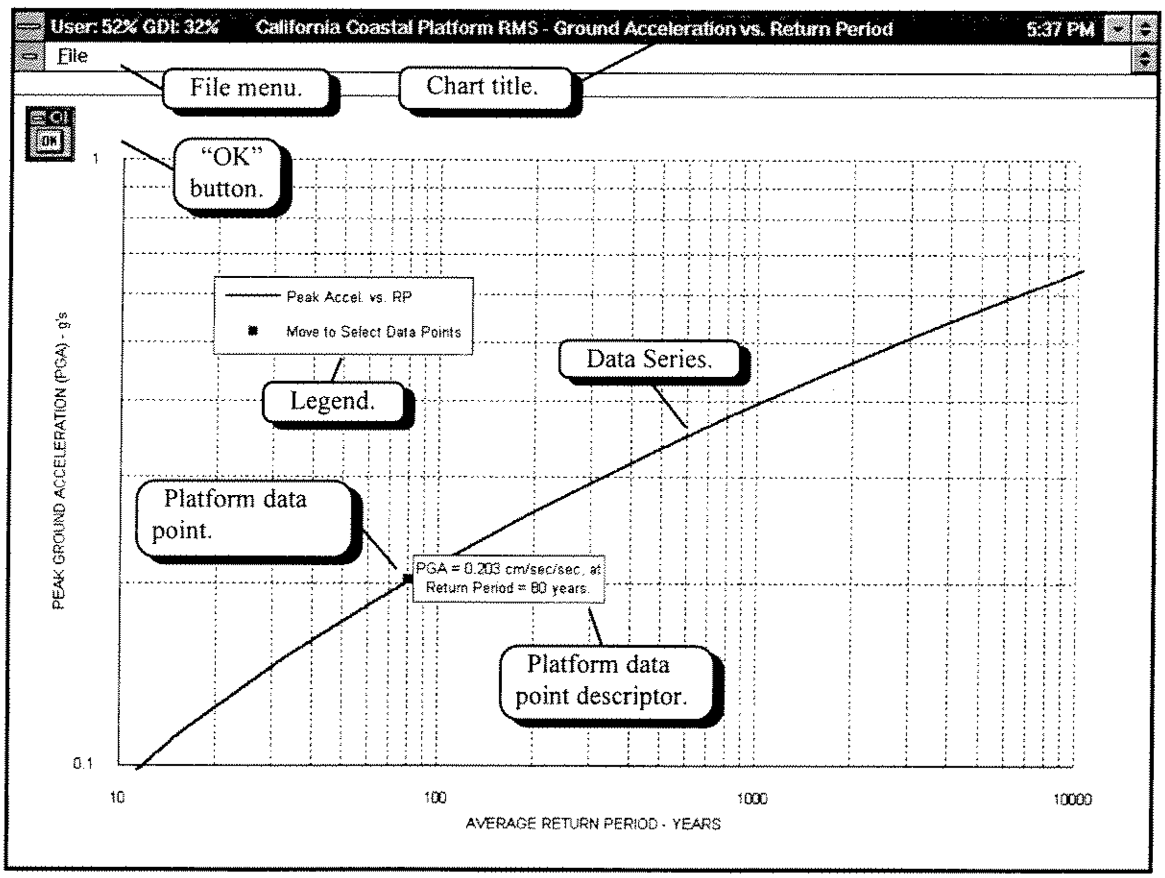

Figure 8
Ground Acceleration vs. Return Period chart.

- The chart title appears in the application title bar ("Ground Acceleration vs. Return Period").
- Selections under the "File" menu allow the chart to be printed, or the program to move on.
- The button displayed in the upper left corner also allows the program to move on (described in more detail later).
- The legend indicates that the red data series (solid red curve on a color monitor) represents Peak Ground Acceleration (detailed in the y-axis label) vs. Average Return Period (detailed in the x-axis label).
- The legend also indicates that the green box with the red cross represents one data point along the PGA-RP curve. This platform data point is to be set for the specific platform in question.
- Scales for this chart are logarithmic.

Moving the platform data point in this chart sets the return period for earthquakes to be used for this particular platform (in this case, the Template platform). This operation is performed by holding the CTRL key while clicking and holding the data point with the mouse. This should cause the point to turn black. It may then be moved horizontally to adjust the return period, and then (after releasing and re-grabbing the point) vertically to meet the PGA-RP curve. While the data point is being moved, its position may be judged both by the values displayed in the left box of the display's formula bar (just below the menu bar), and by the lines appearing on the appropriate axis. Try selecting a return period of 85 years. Using the default curve, this should result in a PGA value of about 0.229 cm/sec/sec (note that the values in the label next to the data point have changed to reflect this). Now click on to move on.

In the resulting dialog box (Figure 9), select the second option, "Save changes for this scenario only," to move on.

The program will then proceed to build the Ground Acceleration Bias chart. This chart is meant to incorporate the combination of Type I and Type II biases, as calculated by the user. To see how data curves are adjusted, select the second option to be presented (Figure 10), "Adjust data series."

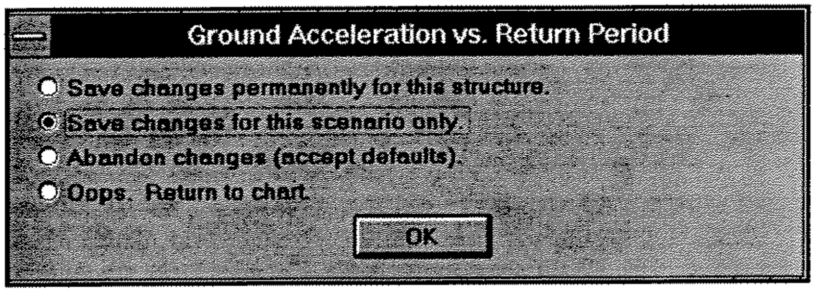

Figure 9
Ground acceleration chart saving options.

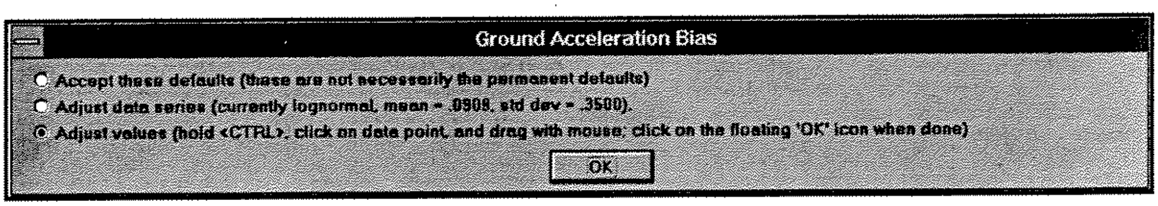

Figure 10
Ground acceleration bias modification dialog.

In the resultant "Probability Distribution" dialog (Figure 11),

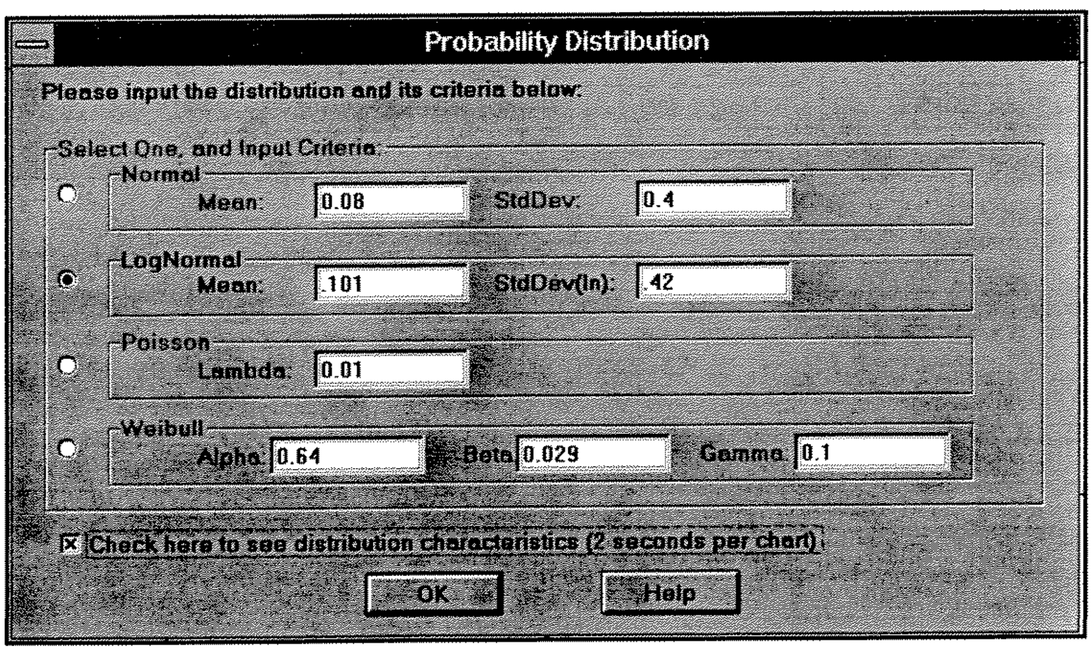

Figure 11
Probability distribution dialog.

set the mean to 0.101 and the standard deviation to 0.42. Also select the option at the bottom to see the distribution characteristics of the new curve and press "OK". The characteristics of the new distribution will be displayed automatically (Figure 12 and Figure 13), and will then return the user to the Bias chart .

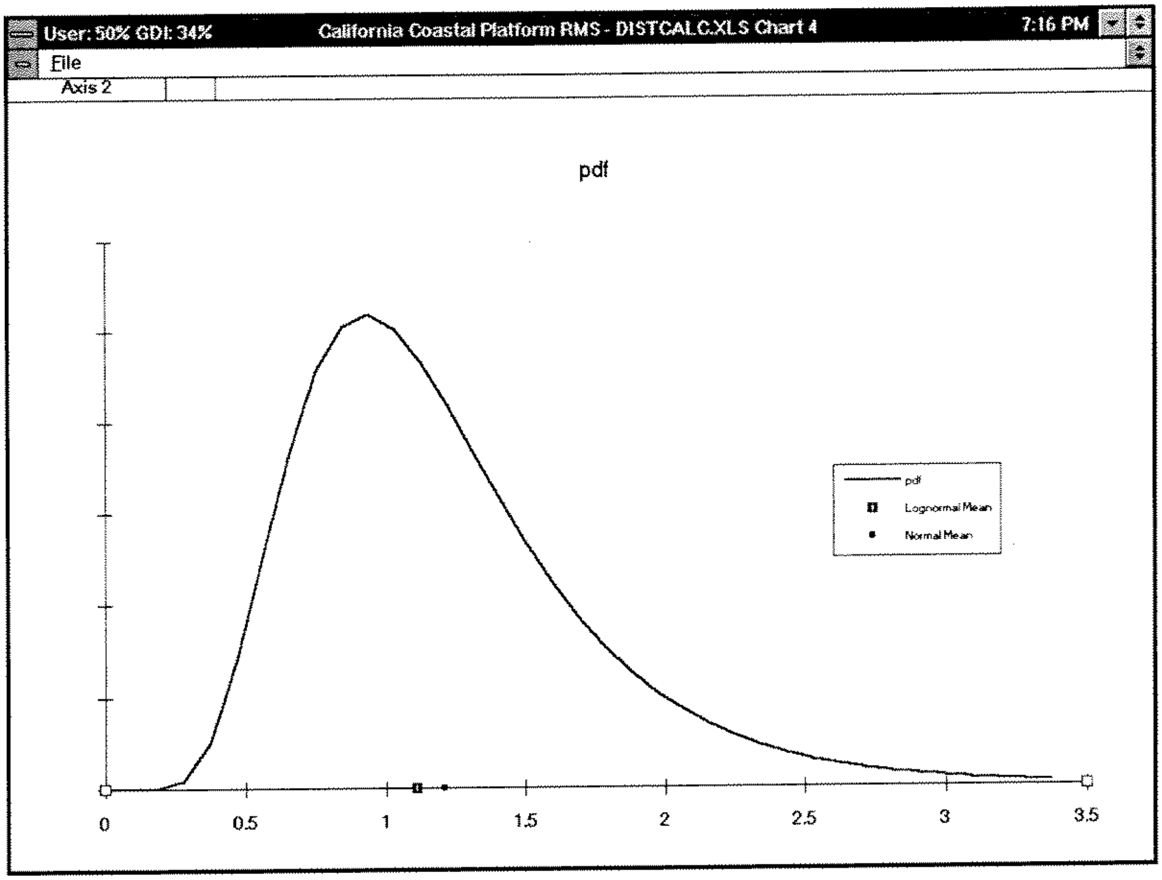

Figure 12
Density function of new distribution.

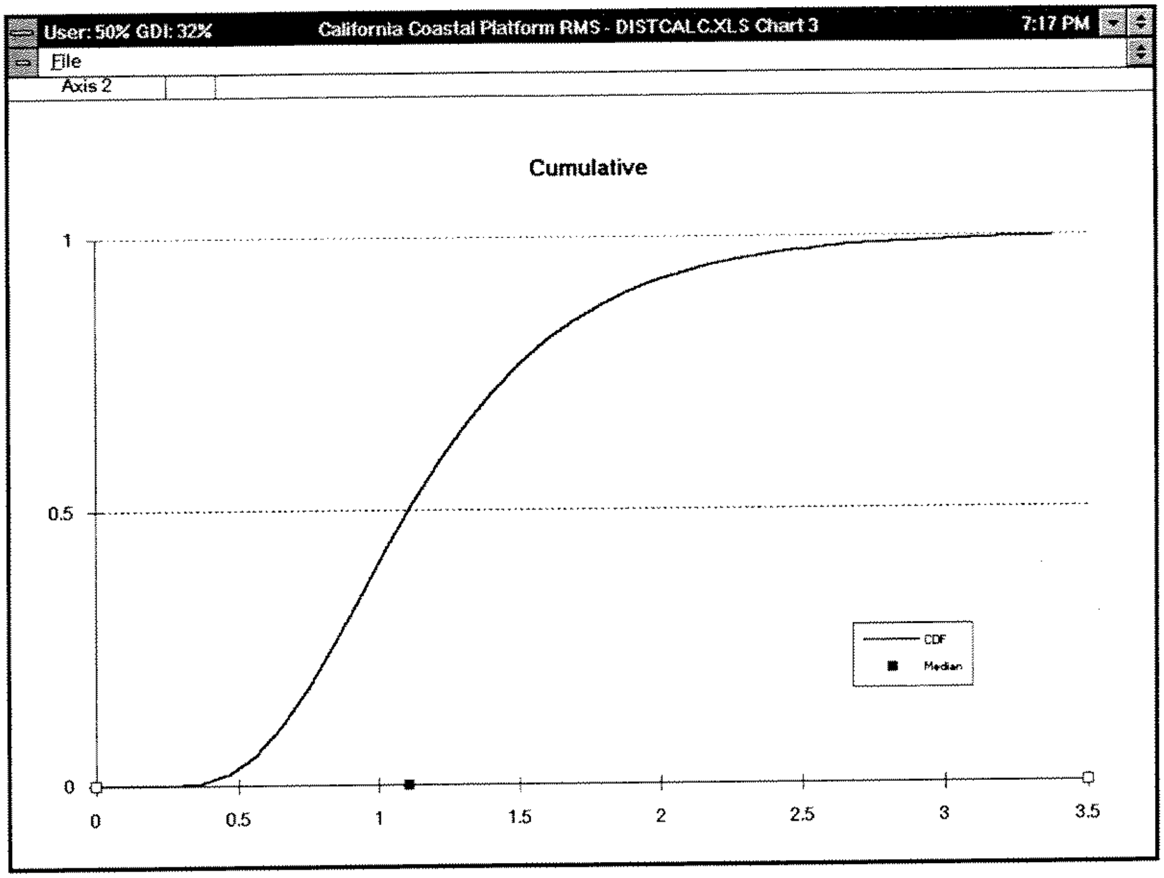

Figure 13
Cumulative density function of new distribution.

After viewing the pdf and the cdf of the chosen distribution, the "Ground Acceleration Bias" dialog box will reappear. Select the third option, "Adjust values." This will bring up the revised Ground Acceleration Bias chart (Figure 14). Click on the icon and select "Save changes for this scenario only" to continue.

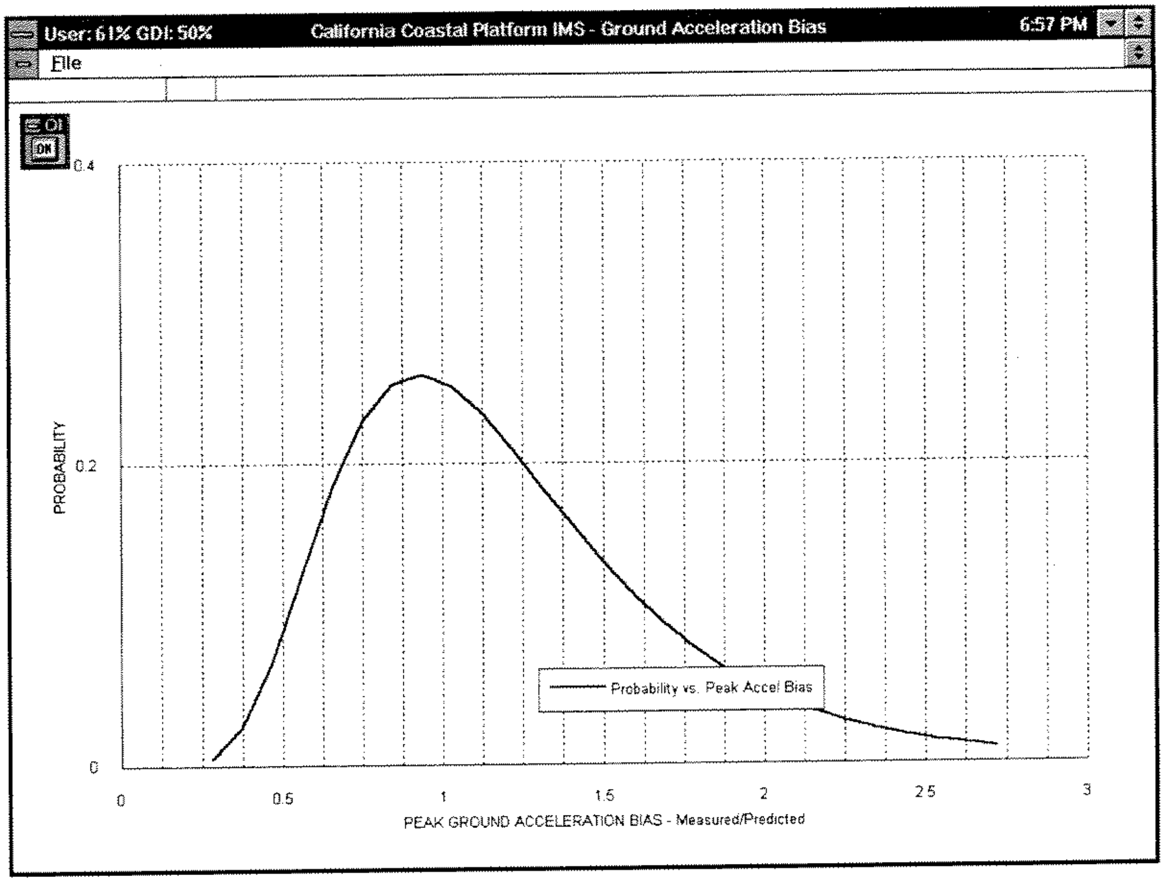

Figure 14
Revised Ground Acceleration Bias chart.

Next, the "Spectral Acceleration/Ground Acceleration" dialog box will appear. Select the third option, "Adjust values," to continue. This chart uses a structure's period and soil type to determine the appropriate ratio of spectral acceleration/ground acceleration. Holding the CTRL key while clicking once on the green data point with the mouse, set the structure's period to 1.5 seconds and move it to the "Type B" soil line. This should result in an Sa/PGA ratio of about 0.9 with a standard deviation (given the default coefficient of variation) of 0.07 (Figure 15).

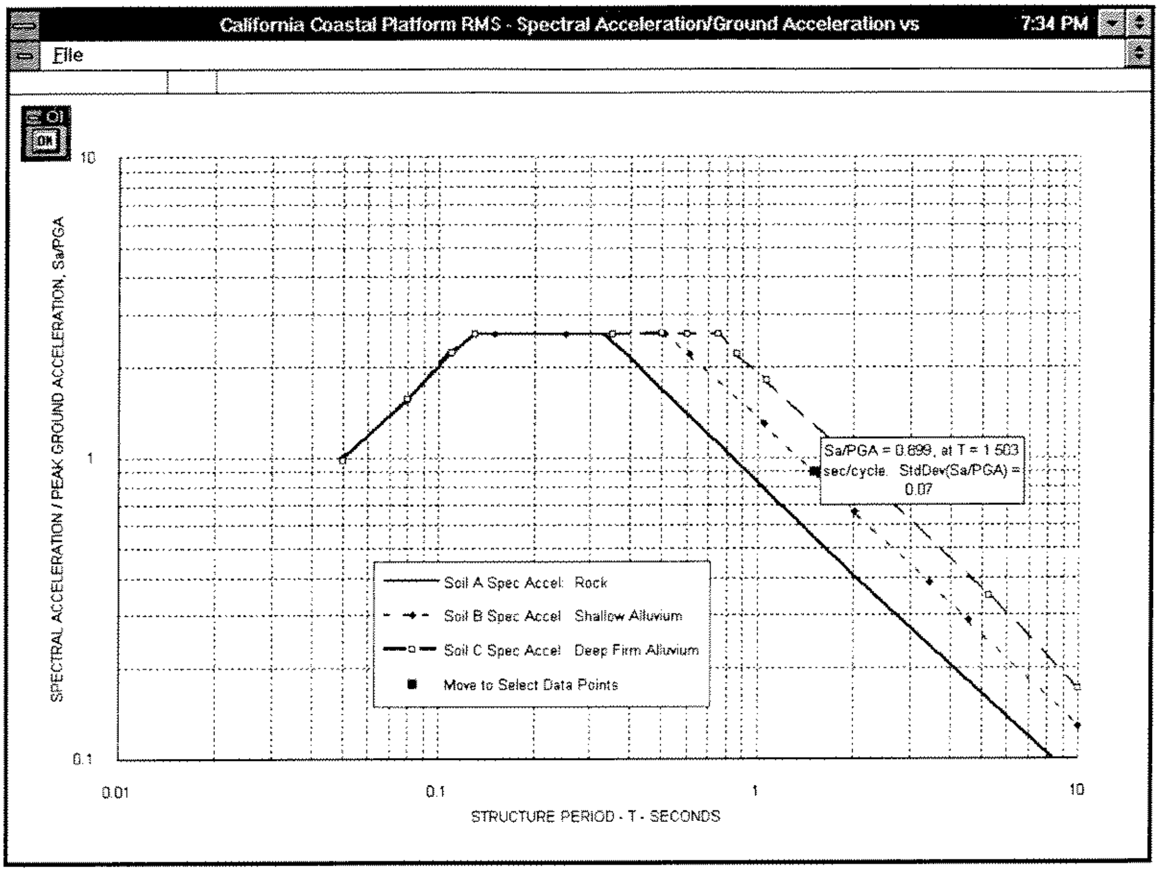

Figure 15
Spectral Acceleration/Ground Acceleration vs. Period chart.

Select the icon and "Save changes for this scenario only" to continue. This brings up the "Spectral Acceleration vs. RP - Results" chart (Figure 16), the last in the ground acceleration series. The curve in this chart is the result of input given in the previous three charts, and thus cannot be changed. Similarly, the Average Return Period was specified in the PGA vs. RP chart, preventing the green data point from being moved horizontally. The user, however, must move the data point up to the curve in order to set the spectral acceleration for this [template] platform. Doing so should result in a value for Sa of about 0.285 cm/sec/sec.

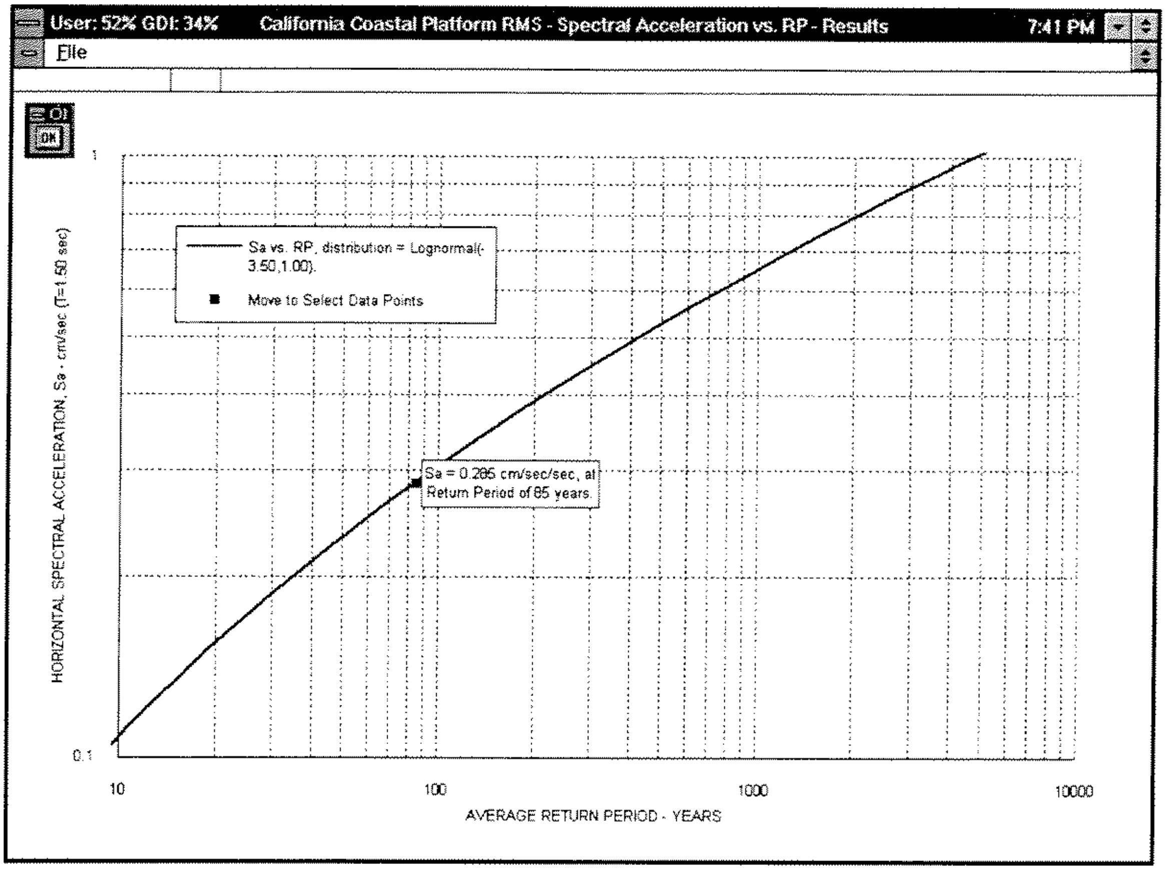

Figure 16
Spectral Acceleration vs. RP Results chart.

When done, hit the icon and choose "Save changes for this scenario only." This will return you to the "Environmental Conditions" menu. Choosing "Max Wave Height" will move the program through a series of graphs similar to those just experienced, only applicable to calculating the maximum wave height rather than ground acceleration (note that the return period set for wave height purposes need not necessarily be the same as that for ground acceleration purposes). "Wind Velocity" and "Current Velocity" are each one-chart procedures, using the return period as set in the wave height operation. For now, select "Return to Main Menu" to proceed. This will bring up the Level One Consequence Assessment worksheet.

In the Main Menu, choose "Consequence Assessment." In the "Consequence Assessment" dialog box (Figure 17), choose "Adjust values."

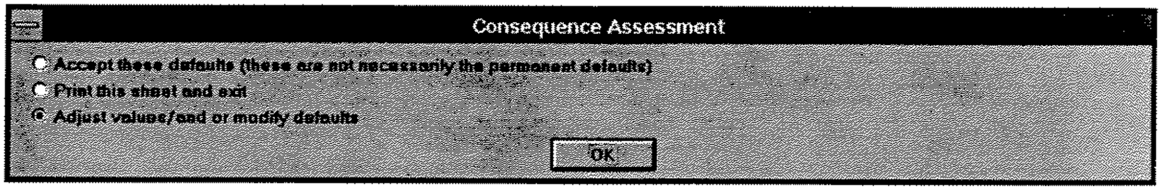

Figure 17
Consequence assessment dialog box.

You will notice that the values for Loss of Life, Spillage, and Economics have been erased, along with all the answers further down on the screen (Figure 18).

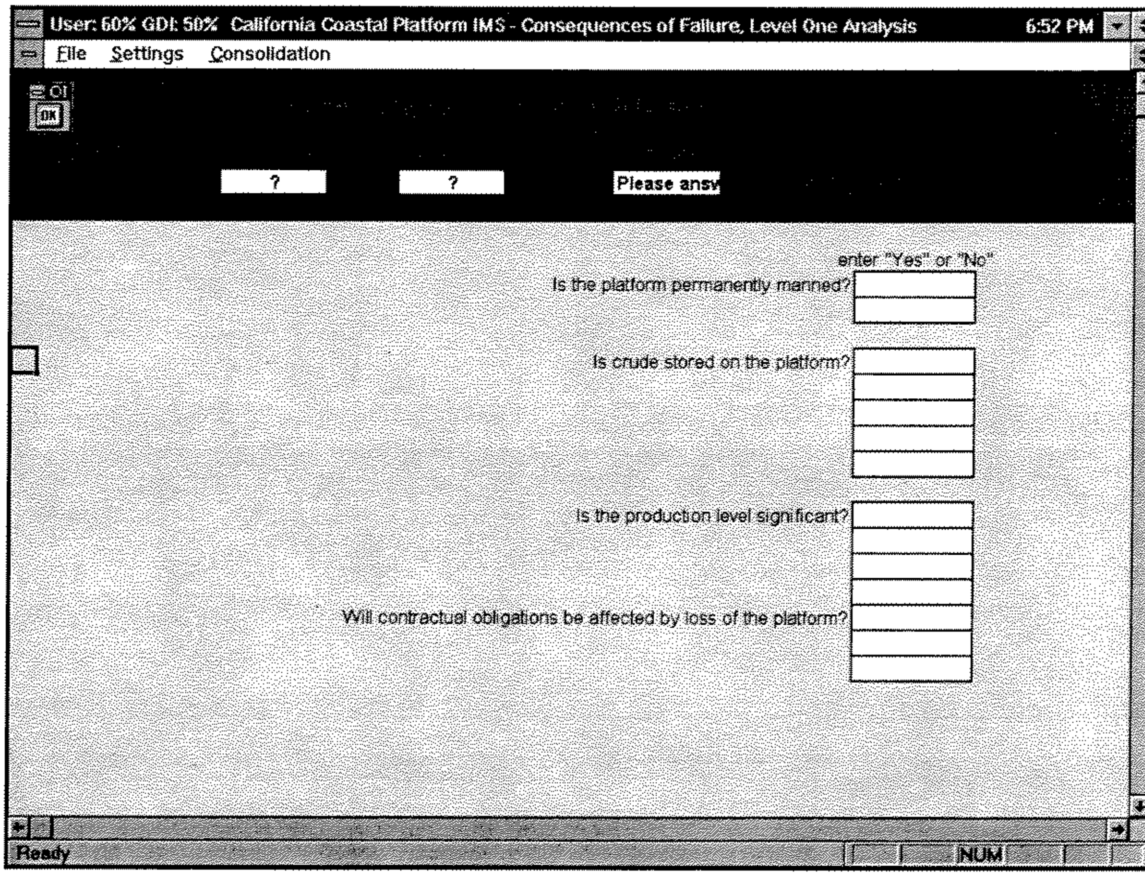

Figure 18
Consequence assessment worksheet, ready for modifications.

It is now necessary to fill in the white boxes (those with the red borders) until the results once again appear at the top. Enter Yes in the top box. This will cause a question to appear next to the second box. Enter Yes in that box also. This will cause "High" to appear in the Loss of Life Results box. Enter No, Yes, and No in the next three boxes; "Very High" will appear in the Spillage Results box. The next visible question should be, "Is the production level significant?" - enter No in that box, and enter No, No, Yes, and Low for the following questions (note that some input boxes without questions next to them are to be skipped). The Economics Results box should now indicate "Medium" (Figure 19).

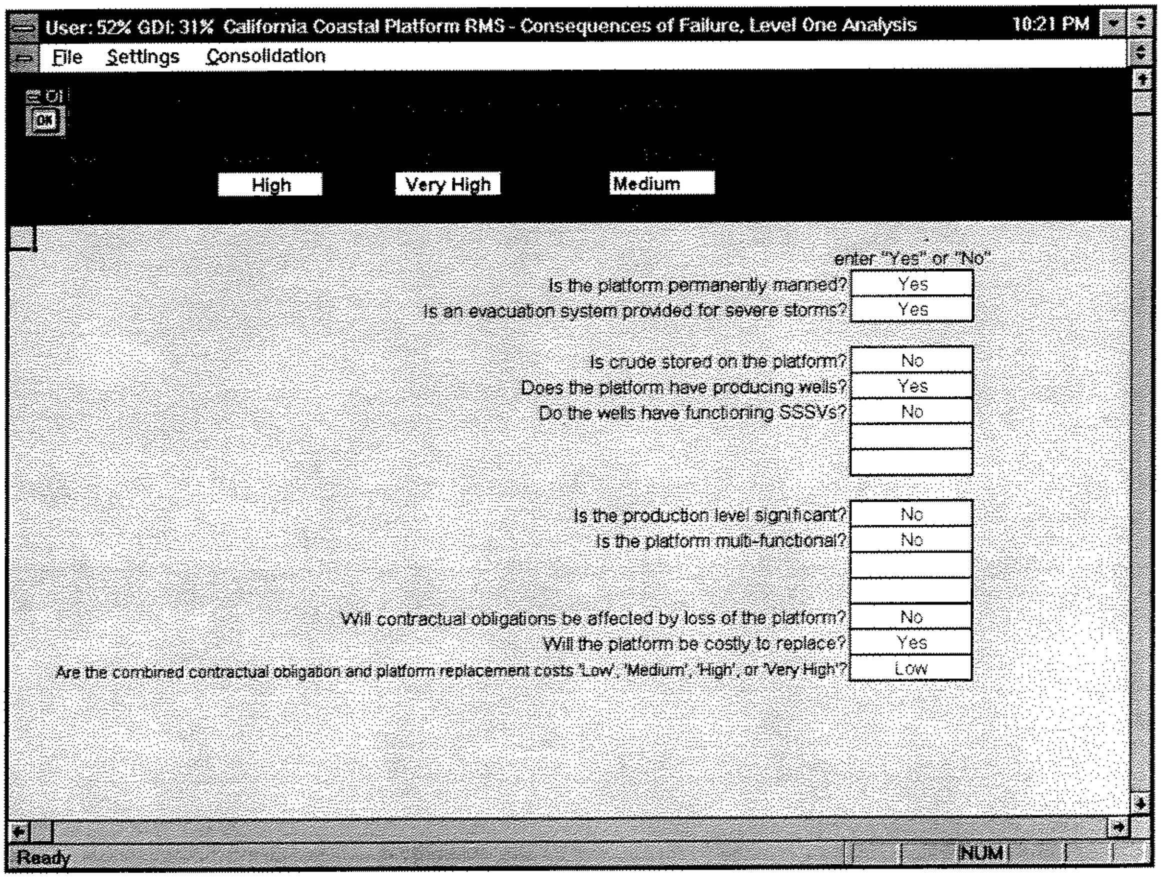

Figure 19
Modified consequence assessment worksheet.

Before clicking on the exit () icon, note the functions available under the menus:

- Under File are choices for Print and Move On.
- Under Settings are choices for Use Defaults, Change Defaults, and Manual Input - these allow use of custom or manual consequence evaluation worksheets.

- Under Consolidation are choices for Don't Combine, Utility Functions, and Tabular Consolidation - these are different methods of consolidating the Loss of Life, Spillage, and Economics criteria.

Without altering any of the menu settings, click the [icon] icon to continue with the program. In the exit menu, choose "Save changes permanently for this structure." The main menu will reappear.

Choosing "Structural Reliability Assessment" will cause the Structural Reliability Assessment menu to appear. Select "Level 1." This will bring up the Level One Structural Reliability worksheet (Figure 20).

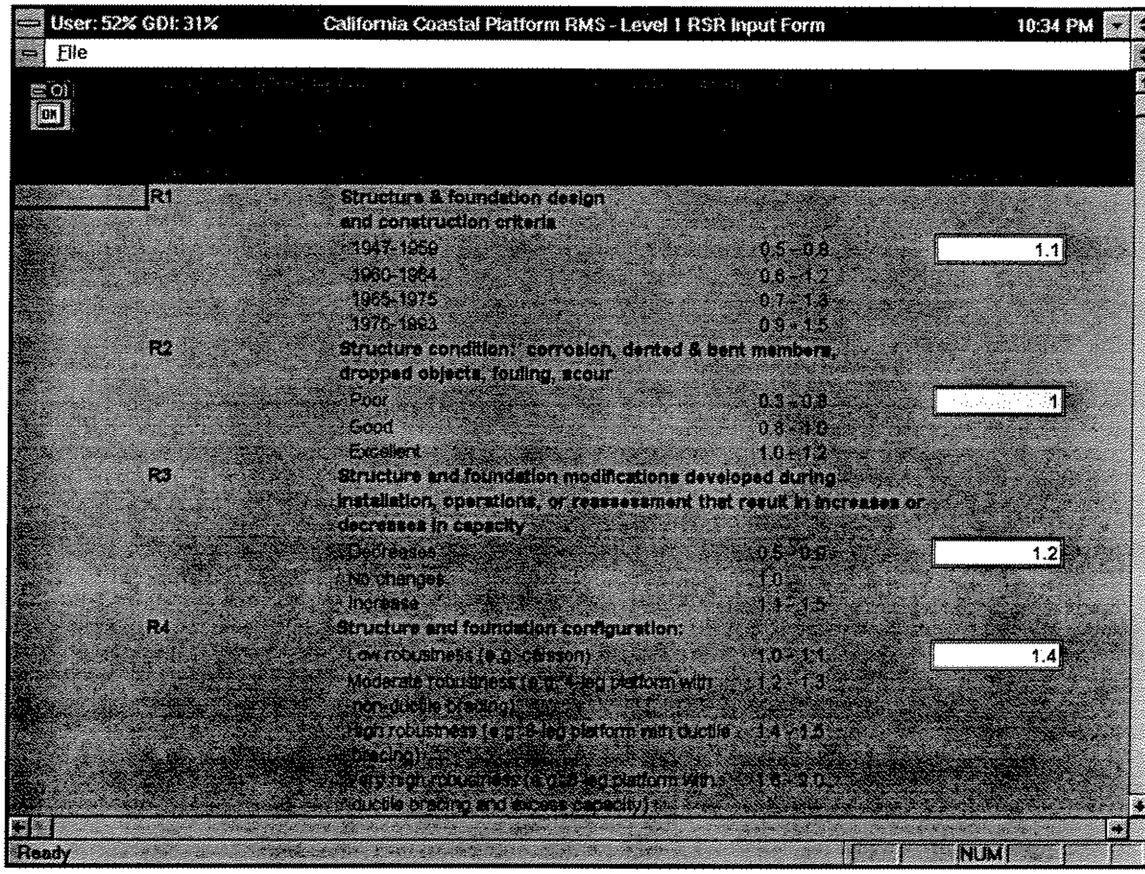

Figure 20
Level One RSR input form (structural reliability worksheet).

This is the Level 1 RSR Input Form. RSR is determined by entering factors R1 through R5 and S1 through S4 in the red-bordered white boxes (scrolling up and down as needed). The result is shown at the top of the form. If 1.1, 1, 1.2, 1.4, 1.2, 0.8, 1.2, 1, and 1 are entered for R1 - R5 and S1 - S4, the RSR will be shown at the top as 2.31. Click to continue.

Selecting "Operational Reliability Assessment" at the Main menu produces the Operational Reliability dialog box (Figure 21). Simply enter an assessment of the probability of failure due to operational error - as in the Environmental Conditions procedure, this is meant only to serve information storage functions.

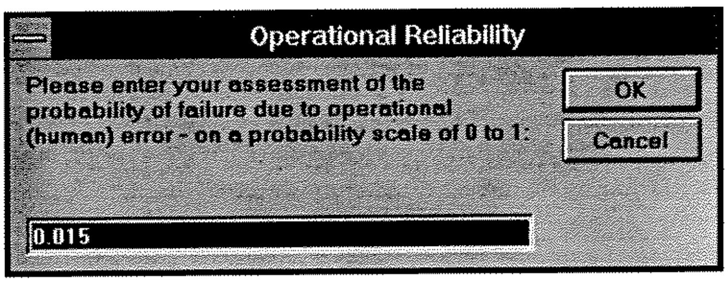

Figure 21
Operational reliability dialog.

Finally, choose "Risk Assessment (Results" from the Main menu. Next will appear the Risk Assessment menu; choose "Level 1" (Figure 22).

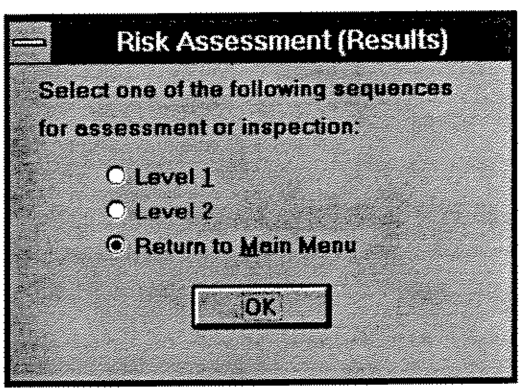

Figure 22
Risk assessment menu.

When given the chance to inspect the existing utility parameters (Figure 23), enter Yes (note that the program will behave differently if you changed the Consolidation Method in the Consequence Assessment procedure - see page 34).

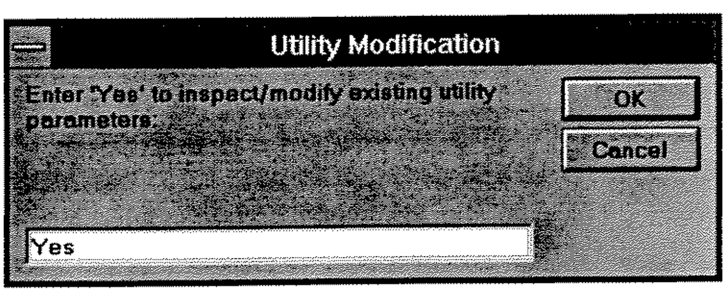

Figure 23
Utility modification dialog.

This will bring up the Utility Evaluation worksheet (Figure 24).

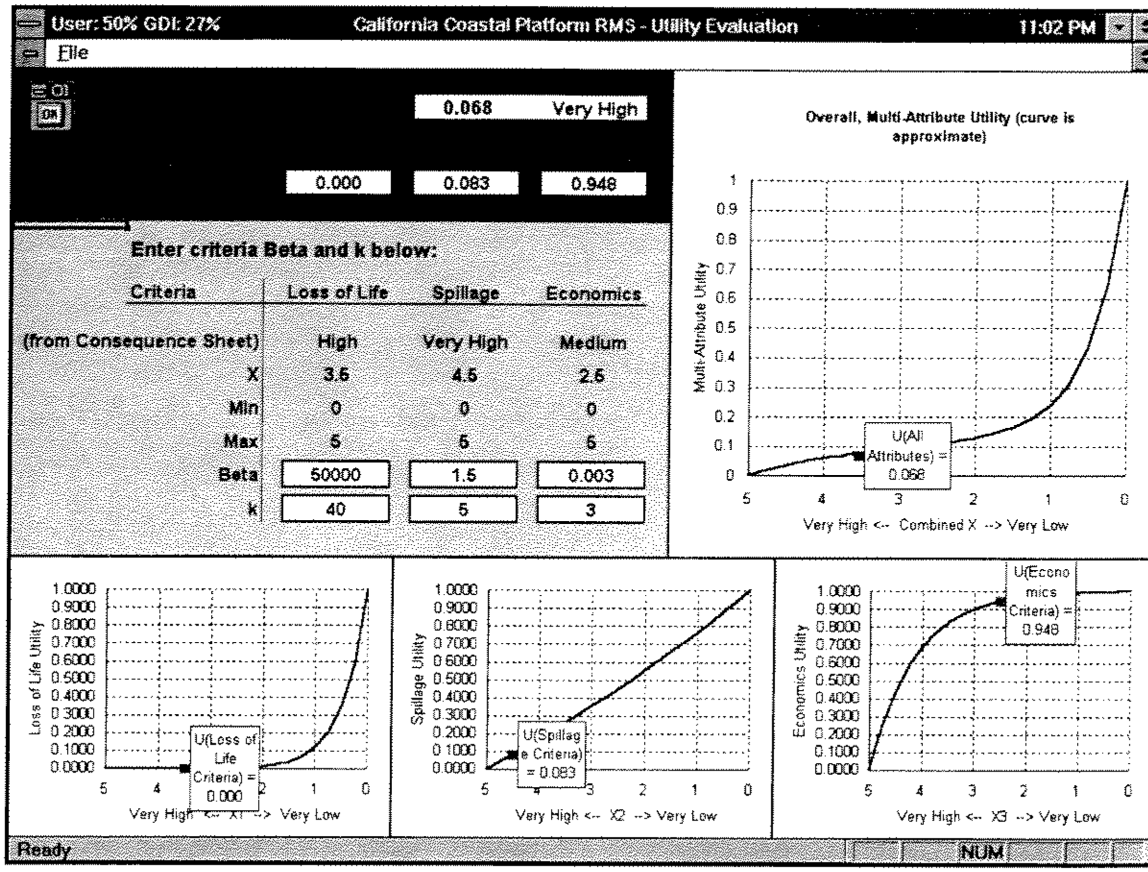

Figure 24
Utility evaluation worksheet.

The Utility Evaluation worksheet is designed for working with utility functions to combine the three separate consequence criteria into one measure. The criteria used in the sheet are those established in the Consequence Evaluation form. These are individually evaluated for their respective utilities per the Beta entries on this worksheet; they are then combined into one overall utility per the k values. Changing Beta changes the individual utility curves (shown at the bottom of the worksheet); changing k changes the overall utility curve (shown at the upper right). For this example, use Loss of Life, Spillage, and Economics Betas of 50,000, 1.5, and 0.003, respectively, and k's of 40, 5, and 3. The overall utility should then be 0.068. Pressing the icon will then bring up the "Level 1 Results - Consequence Measure vs. RSR" dialog box. Select "Adjust values" to clear the box and display the "Level 1 Results - Consequence Measure vs. RSR" chart (Figure 25).

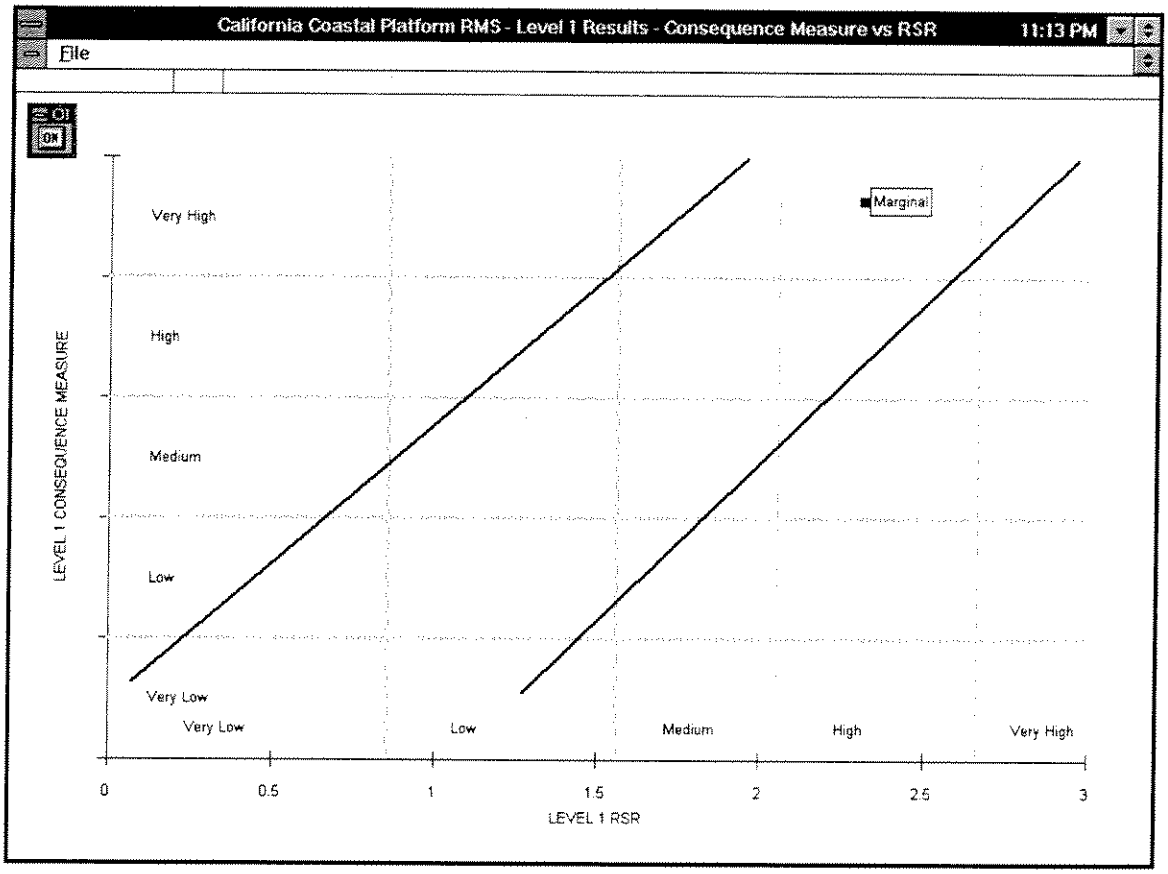

Figure 25
Level 1 Results: Consequence Measure vs. RSR chart.

The position of the green data point (as defined in the Consequence Assessment and Structural Reliability Assessment procedures and therefore unmovable on this chart) indicates whether the platform is Acceptable, Marginal, or Not Acceptable. Adjustments to these criteria are described on page 38. Choose the icon to exit the chart and bring up the Risk Assessment (Results) menu, saving the results for this scenario only. Choose Return to Main Menu, and from there choose Exit Options, and Return to Windows. Hit OK to exit the program. When prompted to save changes in any files, choose "No." The system will then shut down.

Chapter 3: Setting up data files

First, run through the Screening Cycle and Information Storage portions of the program (see Chapters 4 and 5) using the Template file, setting as many "universal" defaults as possible: i.e., if all platforms have the same Peak Ground Acceleration Bias, set that now in the Template file; if all platforms are to have the same Level One "Marginal/Acceptable" guidelines, set those now; etc. (The Template file will be copied in a later step to provide the basis for all platform files.)

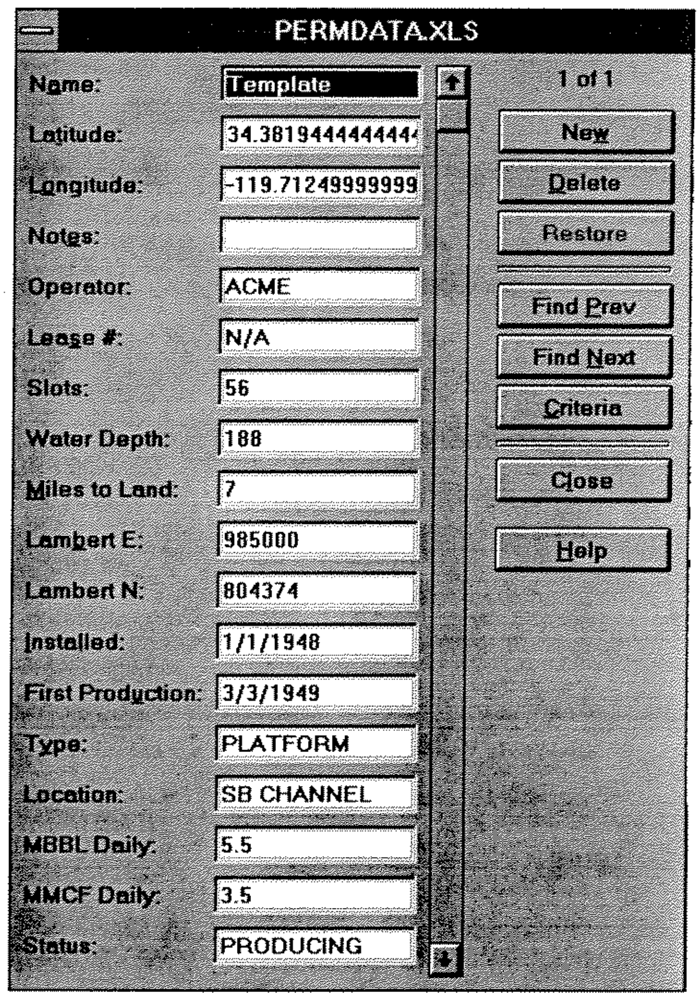

Figure 26
Data file access form.

Close the program, restart, and use the menu on the start-up screen (Figure 3) to select "Review/Modify Data, This Platform." This will bring up a data form for the Template file, *Permdata.xls* (Figure 26).

This accesses data which is not available through the graphical portion of the program. Make sure that the information in the Template file matches that of Figure 26, and hit the [Return] button.

Refer to Appendix B for a listing of California platform data as of 1989. To add any of these, or any others (using other sources of data), files must first be created. This is done by copying the Template file as many times as necessary.

The first step in this process is to tell the database just what file names it should be accessing or copying. First, select "Add/Edit/Delete Platforms" from the menu. This will display the platform name "Template," and the file name "PERMDATA.XLS." To add new platforms, select "New" and enter an appropriate platform name and file name for each platform. BE SURE THAT EACH FILE NAME IS EXACTLY EIGHT CHARACTERS LONG, FOLLOWED BY THE ".XLS" SUFFIX (i.e., for platform "Bill," enter file name "BILL0000.XLS"). Select "Close" when finished.

Selecting "Create Data Files" from the menu now will cause the Template file to be copied to the filenames you just specified. You will be given the opportunity to alter the data for each file; you may do so now, or later via the "Review/Modify Data, This Platform" menu command. You will be asked if you wish to add or delete platforms from the list (Figure 27); since you have already prepared the list, enter No. Next, you will be asked to review data for the Template file; upon selecting "Close," you will be asked whether or not to replace the existing *Permdata.xls* file. Select OK. After another data inspection form for *Permdata.xls* will be shown, (and approved by the user), forms will be shown for each of the platforms entered earlier in the database. Enter the correct data for each file now. Note that although the file name is that which was entered earlier, the platform name must be entered anew. (Navigate on this form using the TAB key; click on "Close" to move on.)

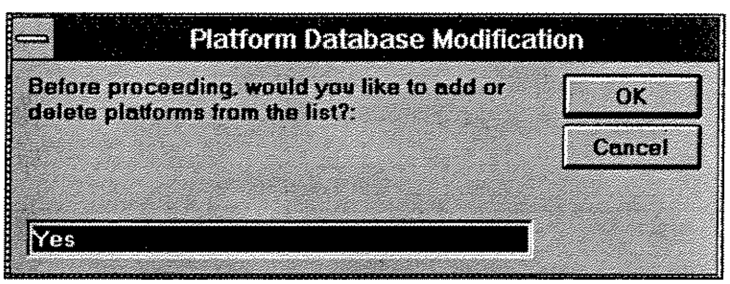

Figure 27
Platform addition/deletion.

Once you've returned to the main program, it is recommended that you check your work by picking a platform (either through the menu or by clicking on the large white "Click here to select a platform" button) and selecting "Review/Modify Data, This Platform" from the menu. (Note that only one platform may be selected per program session.)

Chapter 4: Screening-cycle operations ("normal operation")

As discussed in the Introduction, the California Coastal Platform Information Management System provides screening-cycle as well as information management functions. This chapter describes the former.

A screening cycle is meant to be an accessible, well defined methodology that provides consistency in the periodic assessment of the safety of large numbers of existing structures. This program attempts to reach that goal via the approach shown in

Figure 28, in which the separate Structural Reliability Assessment, Consequence Assessment, and Risk Assessment modules can be seen.[2]

Level One Structural Reliability

The first major Level One Screening Cycle element is Structural Reliability. From the "IMS Operating Menu," choosing "Structural Reliability Assessment" initiates the procedure. Selecting "Level One" loads the "Level 1 RSR Input Form." This is based on Bea and Craig [1993] - the user simply enters scoring factors, based on the displayed guidelines, into the white boxes with red borders. Results are shown at the top of the form (Figure 29 and Figure 30), and are based on this equation [Bea and Craig, 1993, p. 2]:

$$RSR = \frac{R_1 \cdot R_2 \cdot R_3 \cdot R_4 \cdot R_5}{S_1 \cdot S_2 \cdot S_3 \cdot S_4}, \qquad (1)$$

Clicking on the icon closes the worksheet. Data are written to the platform's permanent data file. If a platform has been selected for analysis, then this file will be saved automatically upon program closure. However, if you are modifying the template data file as part of setting up the program, be sure to save *Permdata.XLS* when given the option upon closing the program.

---

[2]Consequence Assessment and Risk Assessment procedures are, by nature, more subjective than objective. This program provides several ways of performing each, none of which is necessarily "right." It is recommended that each organization assess its own needs, use these as a basis to select or modify a single method of performing each procedure, and then disable the alternative methods. Please see Appendix A for more information on disabling program functions.

The Level One Structural Reliability analysis does not explicitly address uncertainties. The user should, however, be aware of the uncertainties involved in assessing the R_1 through S_4 factors, and should bear these in mind when later assessing the Consequence Measure vs. RSR chart (Figure 37).

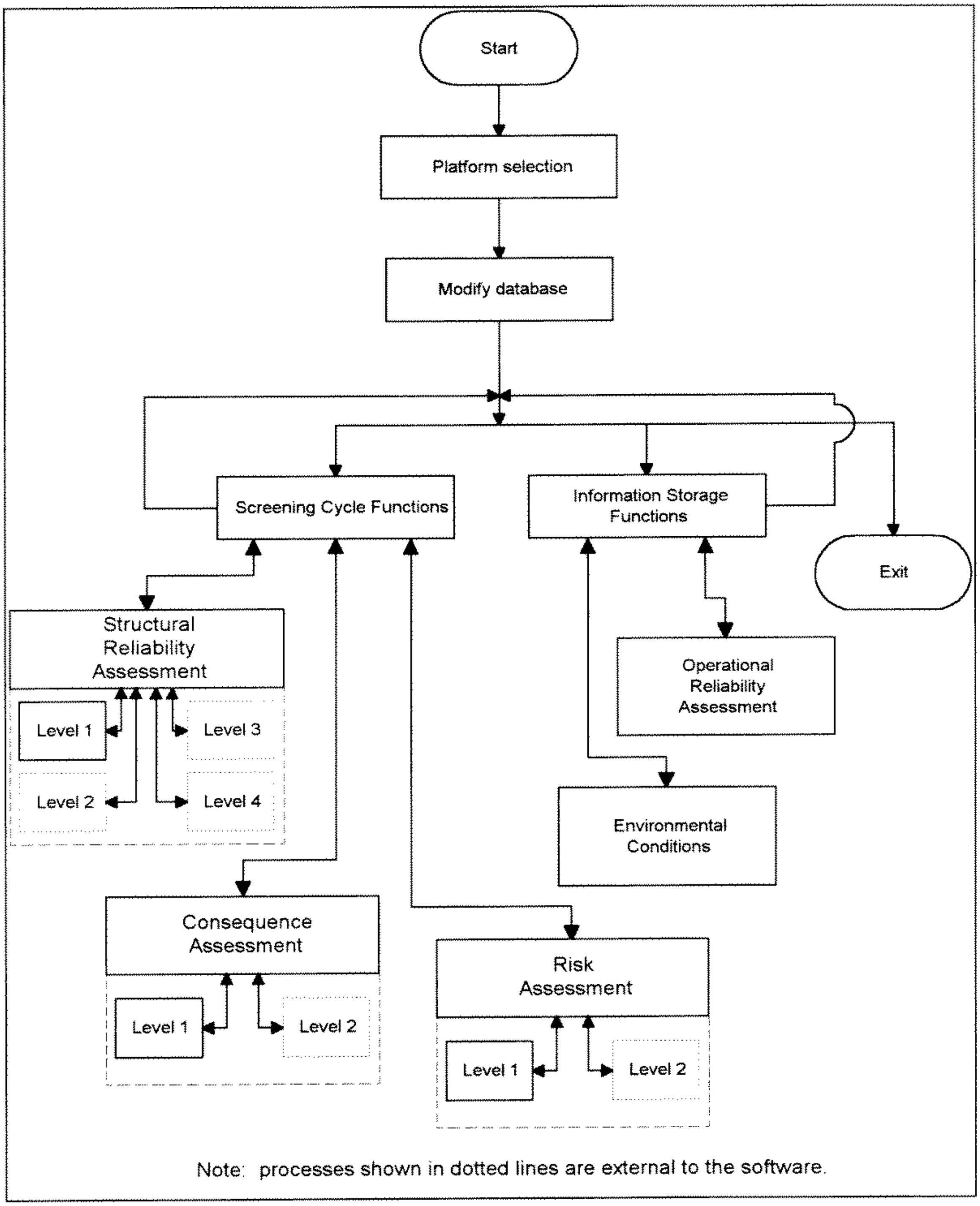

Figure 28
Assessment approach based on appropriate levels of screening detail.

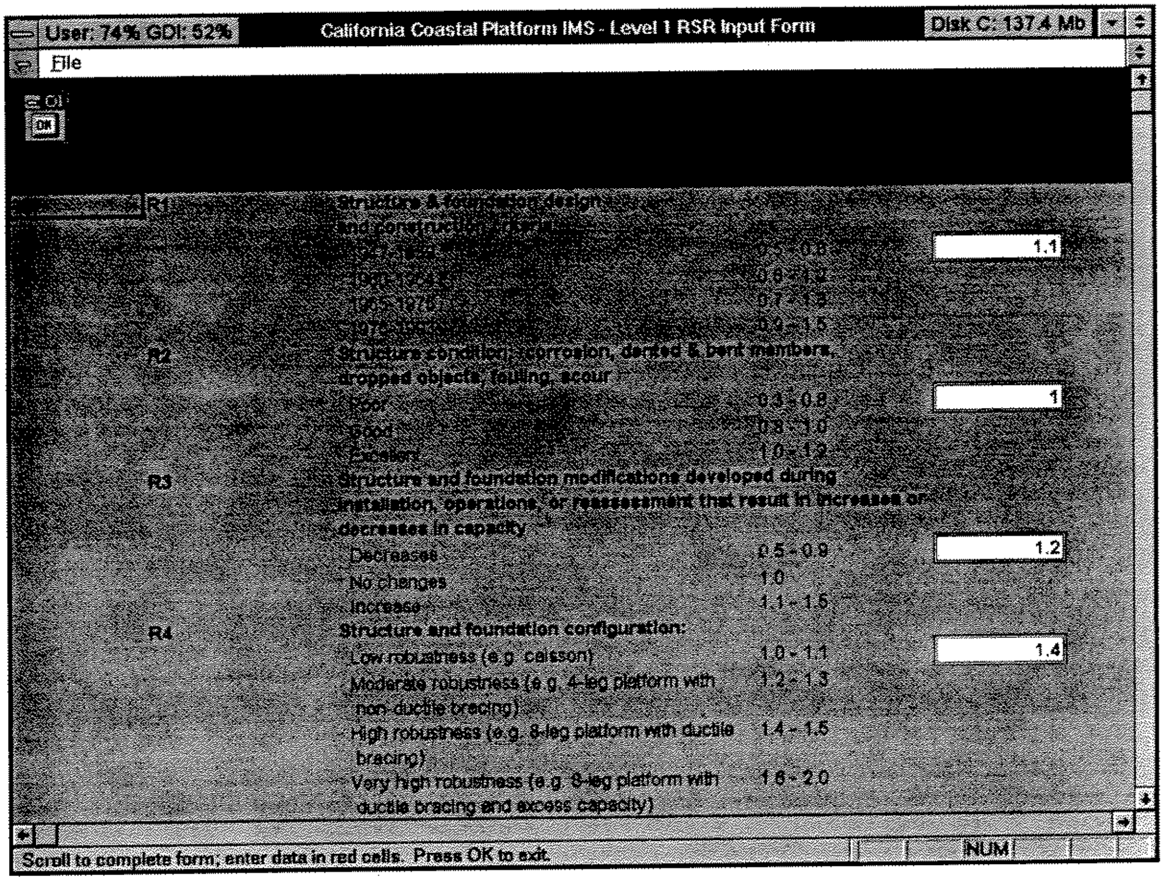

Figure 29
Level 1 RSR Input Form, top portion.

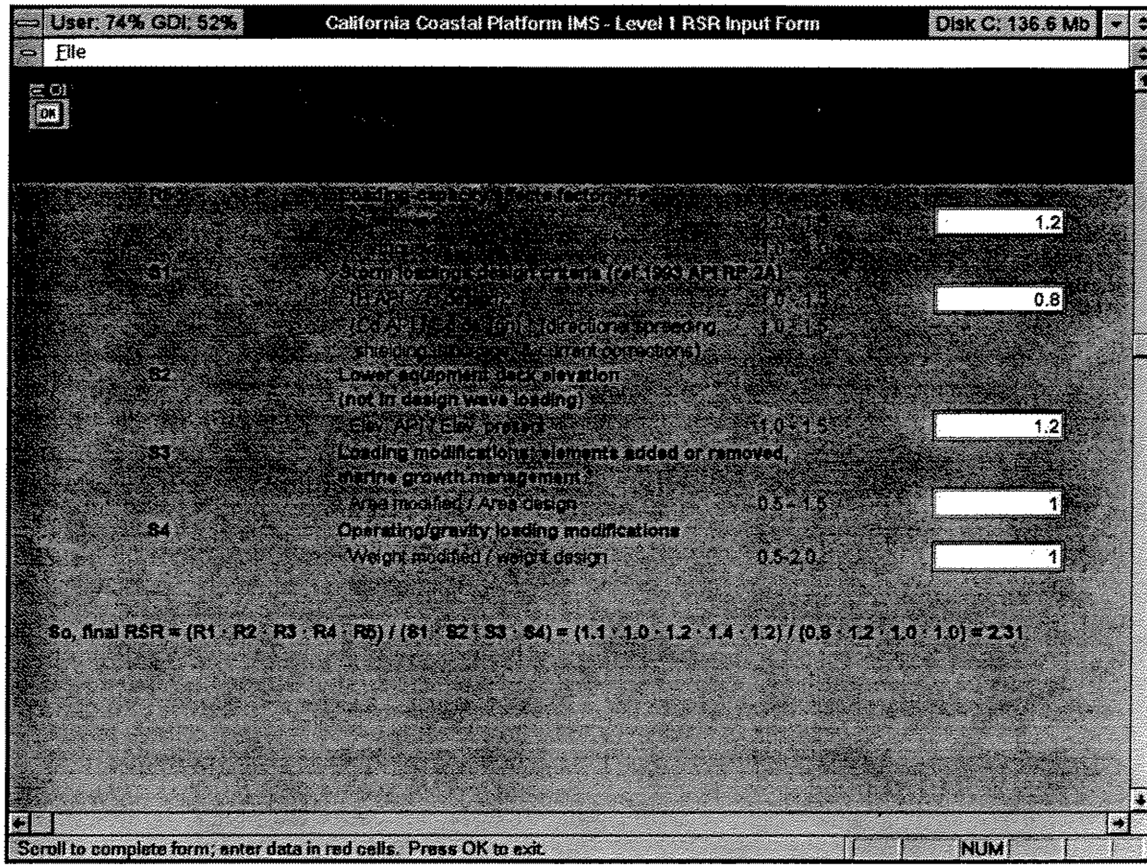

Figure 30
Level 1 RSR Input Form, bottom portion.

Level One Consequence Assessment

The second element of the Level One Screening Cycle is Consequence Assessment. Selecting "Consequence Assessment" from the IMS Operating Menu takes the program into the Level One Consequence Assessment procedures. As

Figure 31 shows, the user is first presented with the options to: accept the consequence settings last used and exit without printing; to accept the settings, print, and exit; or to adjust the settings.

If the adjustment option is chosen, the present worksheet's contents will be cleared. You may then choose to input data, change the method of determining consequences, change the method of combining consequences, print the worksheet, or exit the assessment procedure. All options (with the exception of data input, which is direct to the worksheet) are executed via the menu. Upon choosing to exit, you are given the choice of saving your work, abandoning your work, or returning to the work.

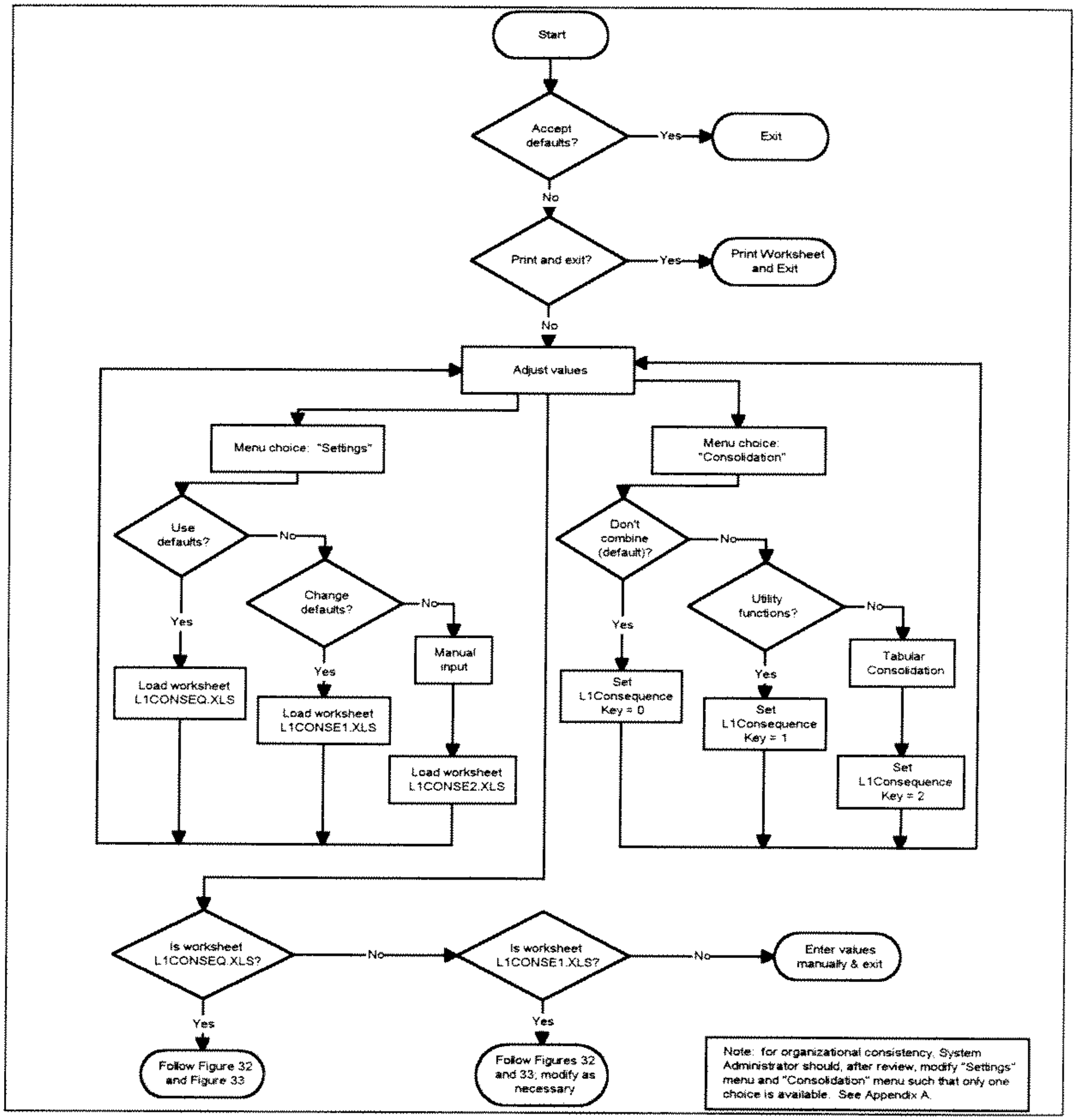

Figure 31
Consequence assessment approach.

"Settings" on the menu bar allows changing the method of determining consequences. "Use defaults" enables the worksheet that utilizes the logic shown in Figure 32 and Figure

33 below. "Change defaults" opens a worksheet that utilizes identical logic, but which may be changed to suit local circumstances. After this sheet is altered, it should be protected with a password (close the IMS normally, then open the worksheet - file *L1CONSE1.XLS* - in Excel to access password functions). "Manual input" bypasses built-in logic, and allows the user to enter any of the five consequence descriptors ("Very Low," "Low," "Medium," "High," and "Very High") directly.

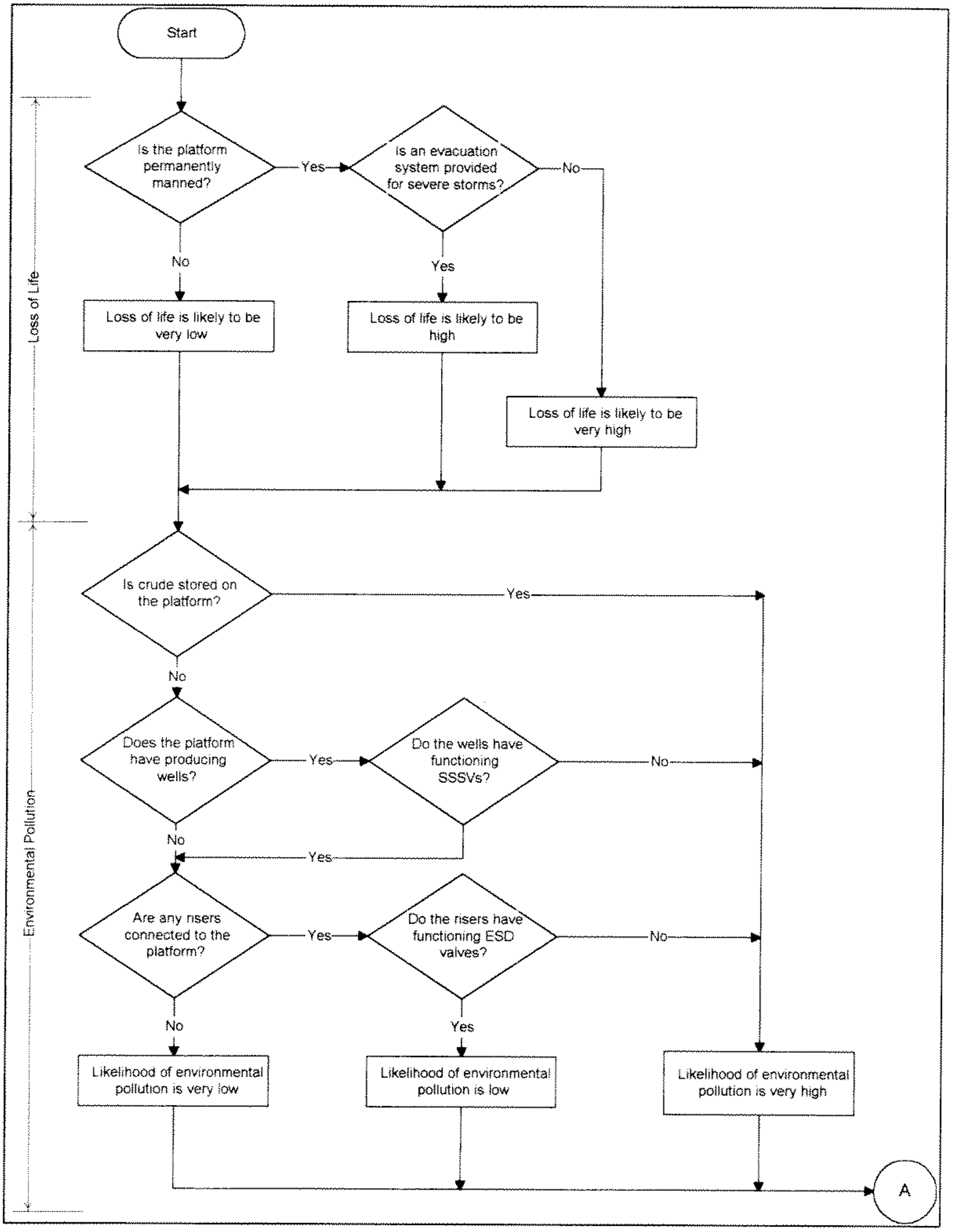

Figure 32
Default consequence evaluation logic.

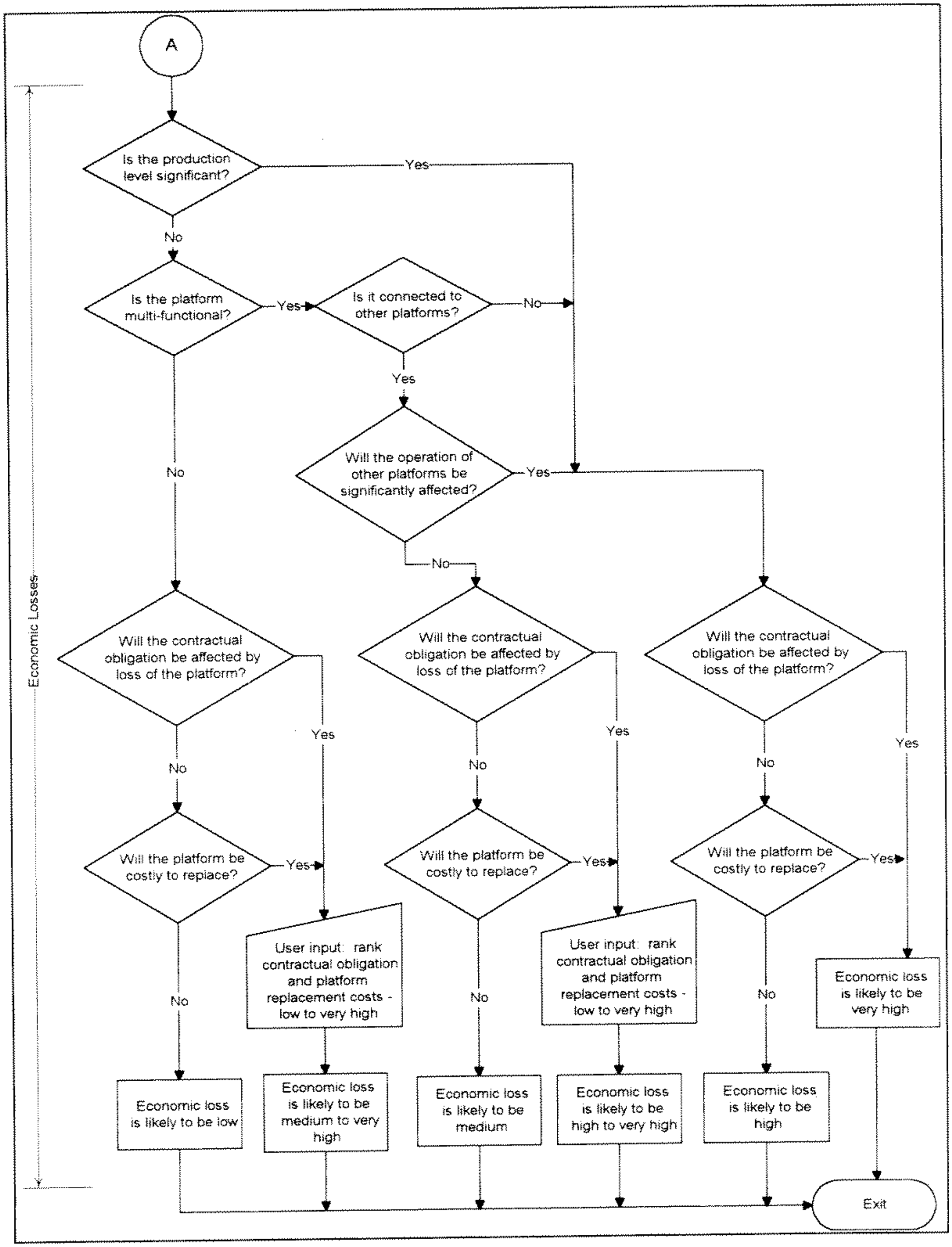

Figure 33
Default consequence evaluation logic.

Changing the method of combining individual consequence measures (via the "Consolidation" menu options) will not affect the actual consequence assessment procedures, but will affect the computation of results in the "Risk Assessment (Results)" area of the program.

Consequence assessment data are saved to the platform's permanent data file. Again, if you have changed consequence settings as part of setting up the program, be sure to save *Permdata.xls* upon exiting the program.

The Level One Consequence Assessment procedure addresses uncertainties solely through the broad language of its consequence descriptors ("Very Low," "Low," "Medium," "High," and "Very High"). The user should, however, be aware of the uncertainties involved in arriving at these descriptors, and should bear these in mind when later assessing the Consequence Measure vs. RSR chart (Figure 37).

Risk Assessment (Results)

The purpose of the "Risk Assessment" procedure is to illustrate graphically, via a "Consequence Measure vs. RSR" chart, the risks calculated by the "Consequence Assessment" and "Structural Reliability Assessment" routines. To do this, some method of consolidating the three different types of consequences must be chosen. As described above, this choice is made under the "Consolidation" menu of the "Consequence Assessment" procedure. There are three choices available:

- Don't combine (default)
- Utility functions
- Tabular consolidation

The effects of these are shown below in Figure 34. The "Don't combine" option presents the "Consequence Measure vs. RSR" chart three times, once for each consequence measure, and does not attempt to combine the three measures into one. Each of the other two options consolidates the individual consequence measures in such a way as to produce only one overall "Consequence Measure vs. RSR" chart. Please note that all of these methods are arbitrary - there is no "correct" way to assess consequences.

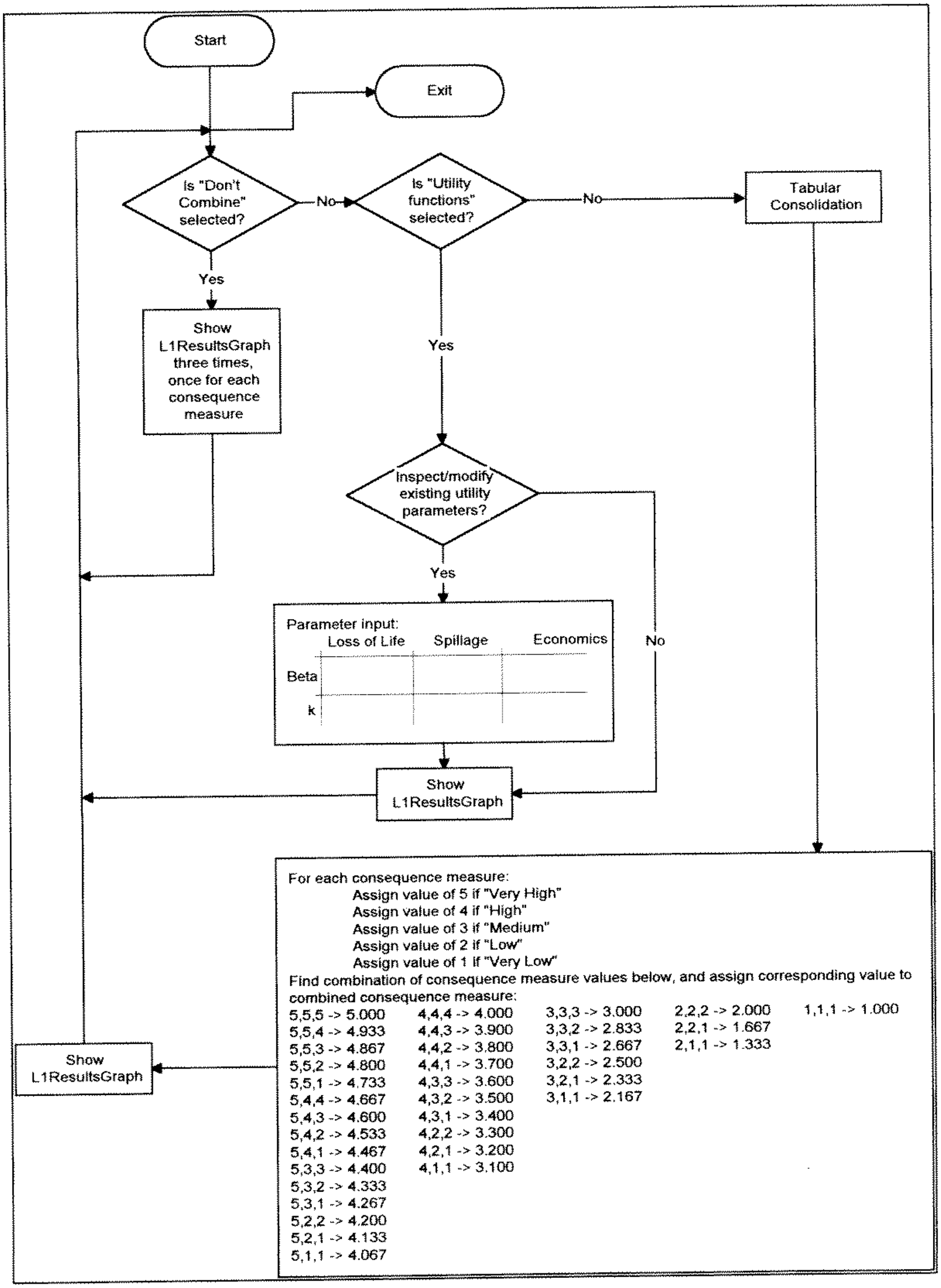

Figure 34
Risk assessment/consequence measure combinatorial logic.

The "Tabular consolidation" option works on the principle that if one consequence measure is high, then the consolidated measure must be at least that high. If, for example, the loss of life consequence measure is "high," the spillage measure is "medium," and the economic measure is "low," the consolidated consequence measure would be in the middle portion of the "high" region. By the table in Figure 34, this translates to a final measure of 3.50. If the "Tabular consolidation" option has been selected, the "Level 1 Risk Assessment" procedure, when executed, will result in the presentation of the "Consequence Measure vs. RSR" chart without showing any intermediate steps.

The "Utility functions" option uses utility theory to express the user's preferences. Utility functions are first defined for each of the three consequence measures, and then for the consolidation of the three. For the individual consequence measures, an exponential utility form is used [modified from Marshall and Oliver, p. 368][3]:

$$U(x_i) = \begin{cases} \dfrac{\beta_i}{\beta_i - 1}\left\{1 - \left[(\dfrac{1}{\beta_i})\right]^{\frac{(x_i - x_{min})}{(x_{max} - x_{min})}}\right\}, & \beta_i \neq 1 \\ 1 - \left[\dfrac{(x_i - x_{min})}{(x_{max} - x_{min})}\right], & \beta_i = 1 \end{cases} , \qquad (2)$$

where i = consequence measure (1, 2, or 3, for loss of life, spillage, or economics), x_{min} = 0, x_{max} = 5, x_i = value of consequence measure i (very low = 0.5, low = 1.5, medium = 2.5, high = 3.5, and very high = 4.5), and β_i is a user-defined attribute ($0 < \beta_i < \infty$). Adjusting β_i to above or below 1.0 modifies the concavity/convexity of the utility curve; in Figure 35 below, the first curve uses a β_i of 0.1, the second uses a β_i of 1.0, and the third uses a β_i of 10.0 (all consequence values in this example are fixed at 2.5).

[3]The user of the "Utility functions" option is expected to be well versed in the establishment of utility and risk preference/aversion functions. This program will not aid in the process of familiarization with these topics.

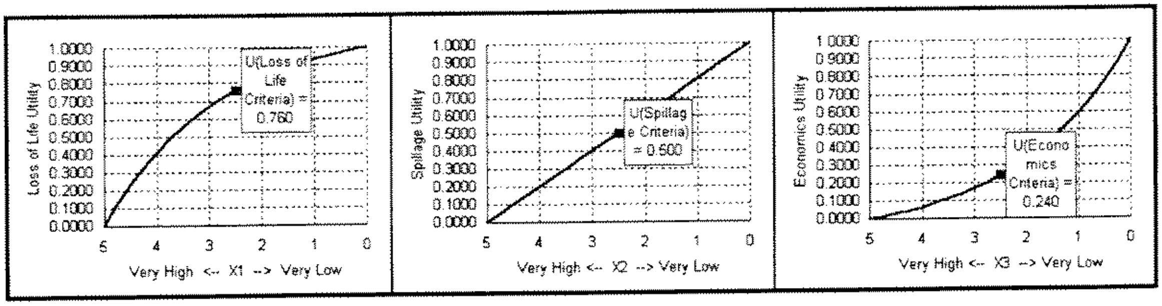

Figure 35
Effects of changing β_i.

The resulting three utilities U_i are combined into a consolidated utility U_c by the following [Aggarwal 1991, p. 172]:

$$U_c = \frac{U_1 k_1}{\sum_i k_i} + \frac{U_2 k_2}{\sum_i k_i} + \frac{U_3 k_3}{\sum_i k_i}, \quad (3)$$

where k_i is a user-defined attribute ($0 < k_i < \infty$) weighting the influence of each of the U_i utilities. Some effects of different values of k_i are shown in Figure 36 below. Using β_i's from above, the left chart shows the case of $k_1 = 10$ while k_2 and $k_3 = 1$; in the middle chart, $k_2 = 10$ while k_1 and $k_3 = 1$; and in the right chart, $k_3 = 10$, while k_1 and k_2 are 1.

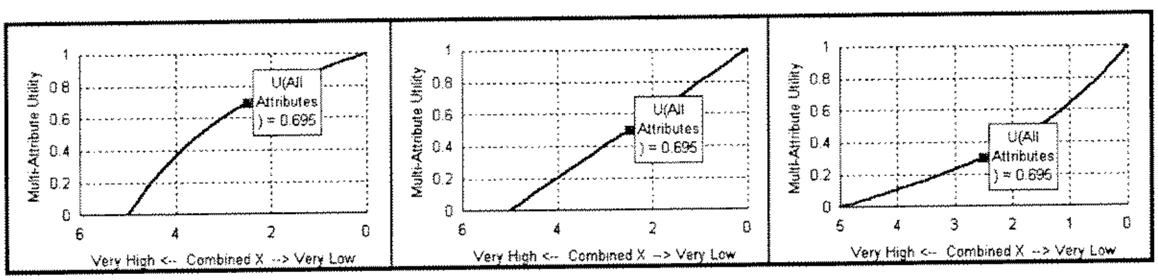

Figure 36
Effects of changing k_i.

Should the "Utility functions" option have been selected, the "Level 1 Risk Assessment" routine will proceed by first asking the user if she/he wishes to inspect or modify the existing utility parameters (β_1, β_2, β_3, k_1, k_2, and k_3). Entering Yes opens the "Utility Evaluation" worksheet. Only the white boxes with red borders - these are the β and k parameters - should be changed. Once these parameters are set (typically for the template data file prior to creating other platform data files), they should not need to be modified.

Regardless of which method of consequence consolidation has been chosen, the program will present at least one "Consequence Measure vs. RSR" chart (see Figure 37 below). The platform's RSR and Consequence results will locate a point on the graph, which will be identified as "Acceptable," "Marginal," or "Not Acceptable" according to its location relative to the solid red "Acceptable" and "Marginal" lines. These lines are movable to suit local conditions - holding the CTRL key, click on the end of a line and move it horizontally or vertically.[4] Please refer to Aggarwal [1991] for more information on this type of chart.

The user must not let the Consequence Measure vs. RSR chart lead to false conclusions. This is possible because the chart apparently illustrates deterministic results. The user must bear in mind that uncertainties exist in the assessment of RSR, in the assessment of Consequence Measure, and in the placing of the "Acceptable" and "Marginal" lines themselves. Thus the data point in Figure 37 should be interpreted as a circle or ovoid, possibly overlapping a much thicker "Acceptable" line, and labeled as "probably acceptable."

[4]On some machines it may be possible to select the upper end of the line with the mouse but not the lower. In this case, move to the lower end by selecting the upper end and then hitting the <left arrow> key.

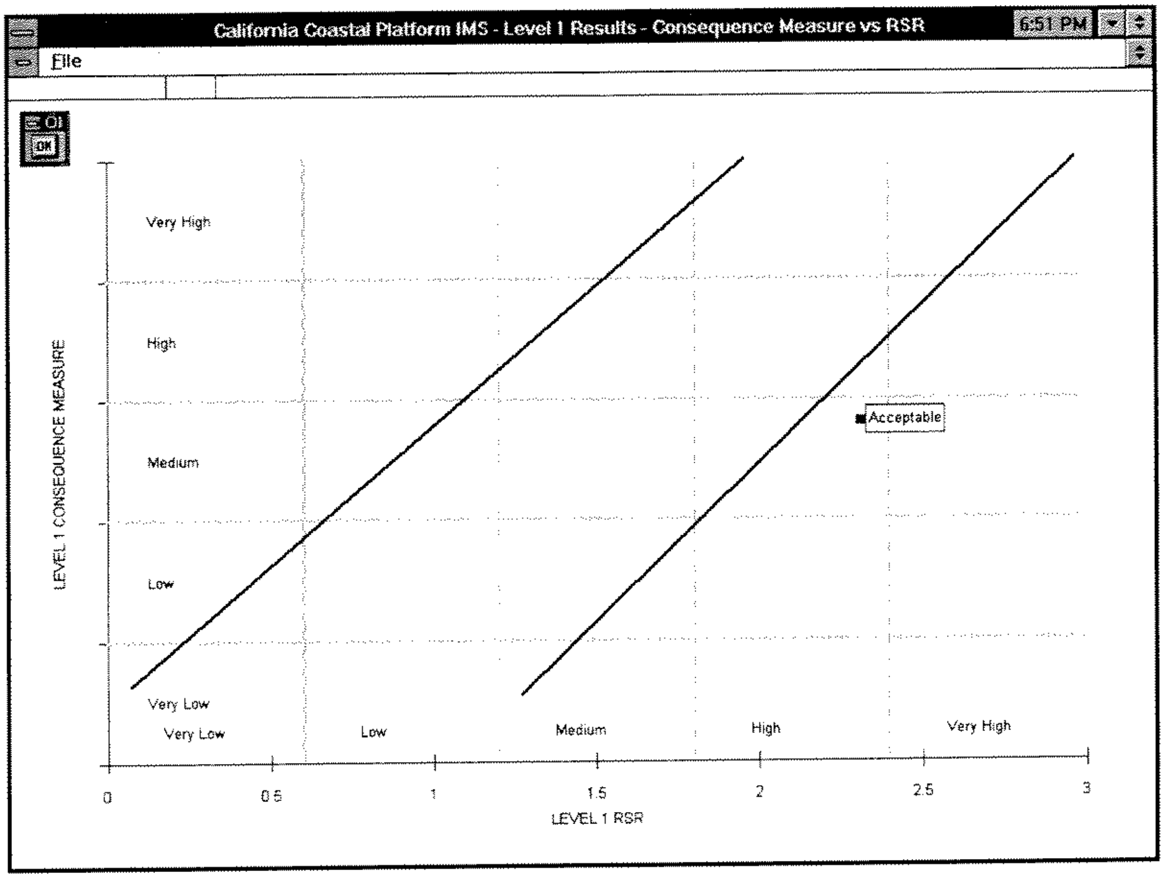

Figure 37
Consequence Measure vs. RSR chart.

"Save" and "Print" functions in Screening Cycle operations:

Any changes made to the Level One Structural Reliability, Consequence Assessment, or Risk Assessment worksheets will be saved to the temporary configuration file, *Build2.xls*. Similarly, any modifications to the "Acceptable" or "Marginal" lines of the "Consequence Measure vs. RSR" chart are saved to *Build2.xls*. Therefore, if any of these screens have been modified, be sure to save *Build2.xls* when given the opportunity upon closing the program.

All major program elements include an option to print under the menu selection "File."

Chapter 5: Advanced environmental data capabilities

Along with managing basic platform data (see Chapter 3 above for a complete description) and performing screening cycle functions, the California Coastal Platform Information Management System provides for the graphical input and storage of probabilistic environmental data. Four types of such data are accommodated: ground acceleration, maximum wave height, wind velocity, and current velocity.

Ground acceleration

The system graphically solicits and stores a probabilistic description of ground acceleration values expected per platform. This description is a function of the distribution of peak ground acceleration values at specified return periods, the bias in that distribution, and the spectral acceleration/peak ground acceleration ratio for a specified structural period. The result is a probabilistic value for horizontal spectral acceleration.

The ground acceleration series, which initiates after the user chooses the "Ground Acceleration" option in the Environmental Conditions menu, consists of three input charts ("Ground Acceleration vs. Return Period," "Ground Acceleration Bias," and "Spectral Acceleration/Ground Acceleration") and one output chart ("Spectral Acceleration vs. RP - Results") - see Figure 38, Figure 42, Figure 46, and Figure 50. The "Ground Acceleration vs. Return Period" chart is the first in the series to come up. This chart is used to enter the distribution of peak ground acceleration values at specified return periods, and to peg the return period to be used for this platform (see Figure 38 through Figure 41). The "Ground Acceleration Bias" chart is used to account probabilistically for biases in the peak ground acceleration distribution; this chart is meant to handle both Type I (inherent) and Type II (modeling) biases,[5] as combined into one function by the user (see Figure 42 through Figure 45).

The "Spectral Acceleration/Ground Acceleration" chart (Figure 46 through Figure 49) is used to enter the spectral acceleration/ground acceleration ratios as a function of struc-

[5]See Bea [1990] for more on bias.

tural periods, to specify the degree of confidence the user has in those ratios (via setting the coefficient of variation of the Sa/PGA line), and to specify the structural period for this platform. Unlike the data series in the first two charts, the spectral acceleration/ground acceleration ratio function is modifiable only by direct graphical manipulation (in the first two charts, the peak ground acceleration function and the bias function are based on distribution characteristics, and direct graphical manipulation has no effect on retained values).

The last ground acceleration chart, "Spectral Acceleration vs. RP - Results," gives the distribution of horizontal spectral acceleration values as a function of return periods (Figure 50 and Figure 51). The distribution shown on this chart is a function of preceding charts, and thus cannot be changed. However, the user is cautioned to always remember to move the platform data point vertically to the curve of the distribution. It is this value which is the final output of the graphical series, and which will be retained by the system (should the option to save be chosen).

The distribution in the final, "Spectral Acceleration vs. RP - Results" graph is calculated as follows:

$$\mathrm{Mean(Sa)} = \mathrm{Mean(PGA)} + \mathrm{Mean(Bias)} + \mathrm{Ln(Sa / PGA)} \tag{4}$$

$$\mathrm{StDev(Sa)} = \sqrt{(\mathrm{StDev(PGA)})^2 + (\mathrm{StDev(Bias)})^2 + \left(\mathrm{Ln}(1 + (\mathrm{COV(Sa / PGA)})^2)\right)^2} \tag{5}$$

where the first term on the right-hand side of each equation comes from the "Ground Acceleration vs. Return Period" chart, the second term comes from the "Ground Acceleration Bias" chart, and the third term comes from the "Spectral Acceleration/Ground Acceleration" chart (see Figure 39, Figure 43, Figure 47, and Figure 48).

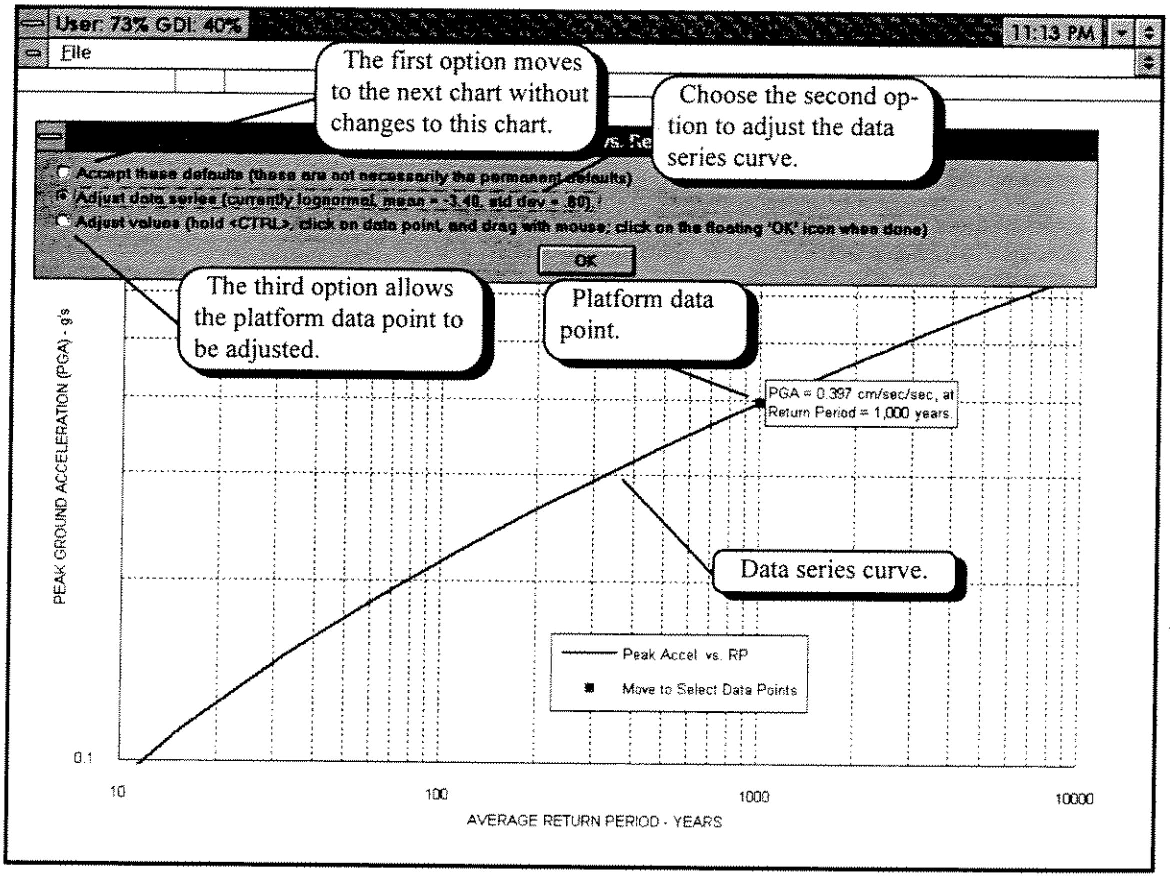

Figure 38
Ground Acceleration vs. Return Period input chart - adjustment options.

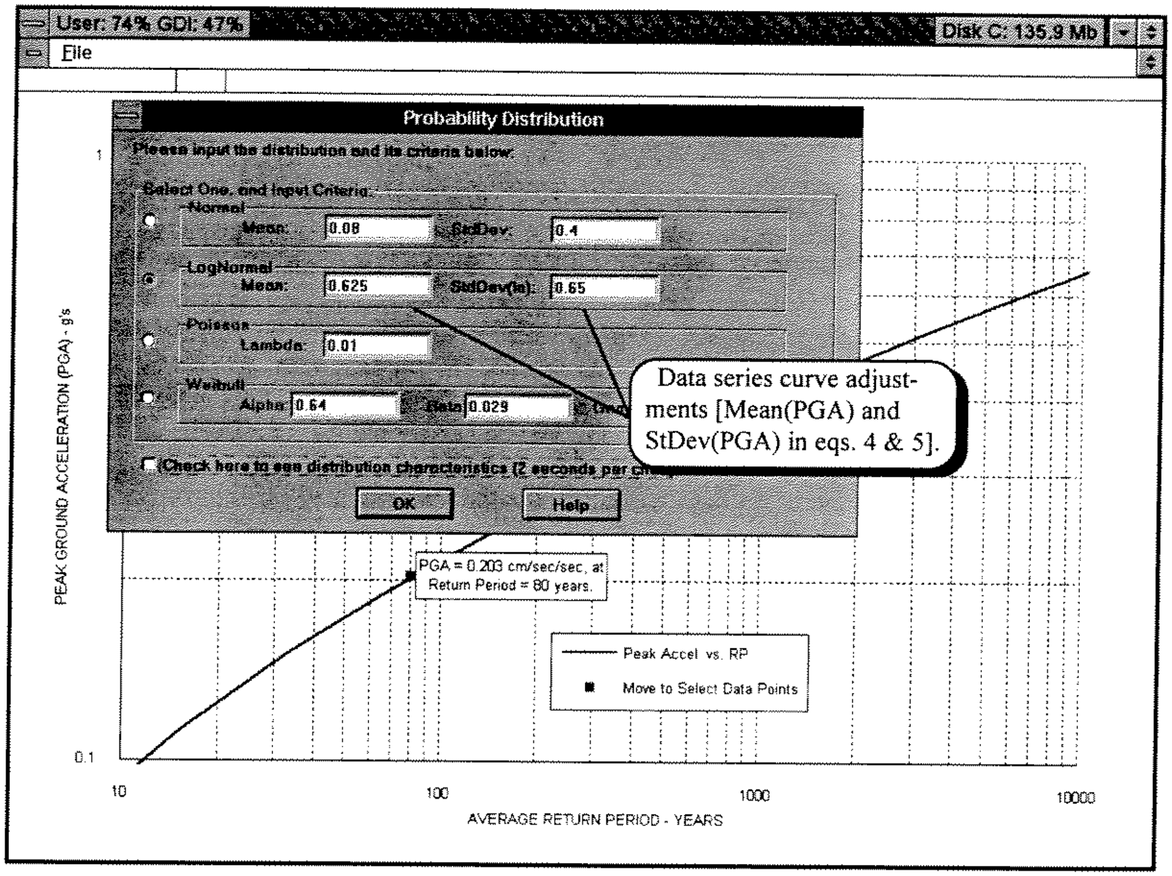

Figure 39
Ground Acceleration vs. Return Period input chart - changing data series distribution.

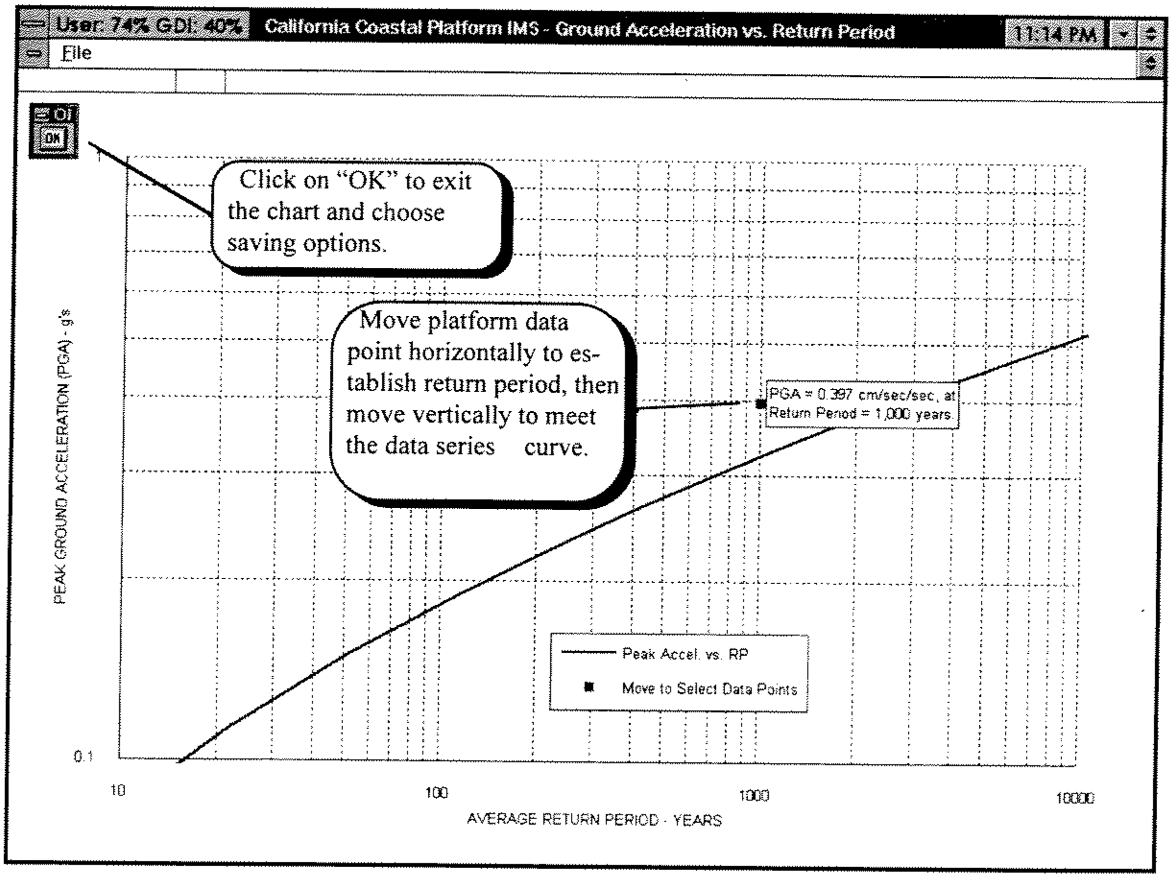

Figure 40
Ground Acceleration vs. Return Period input chart - manual adjustment screen.

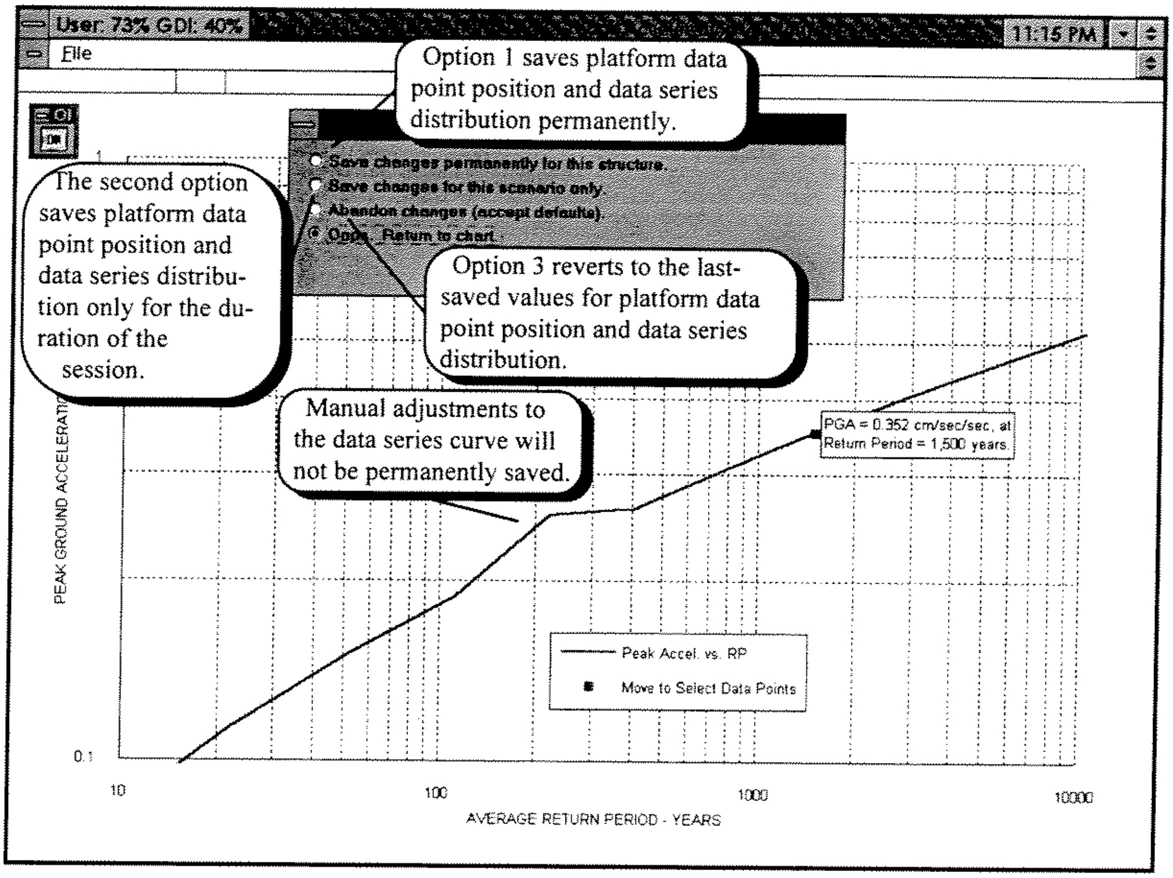

Figure 41
Ground Acceleration vs. Return Period input chart - saving options.

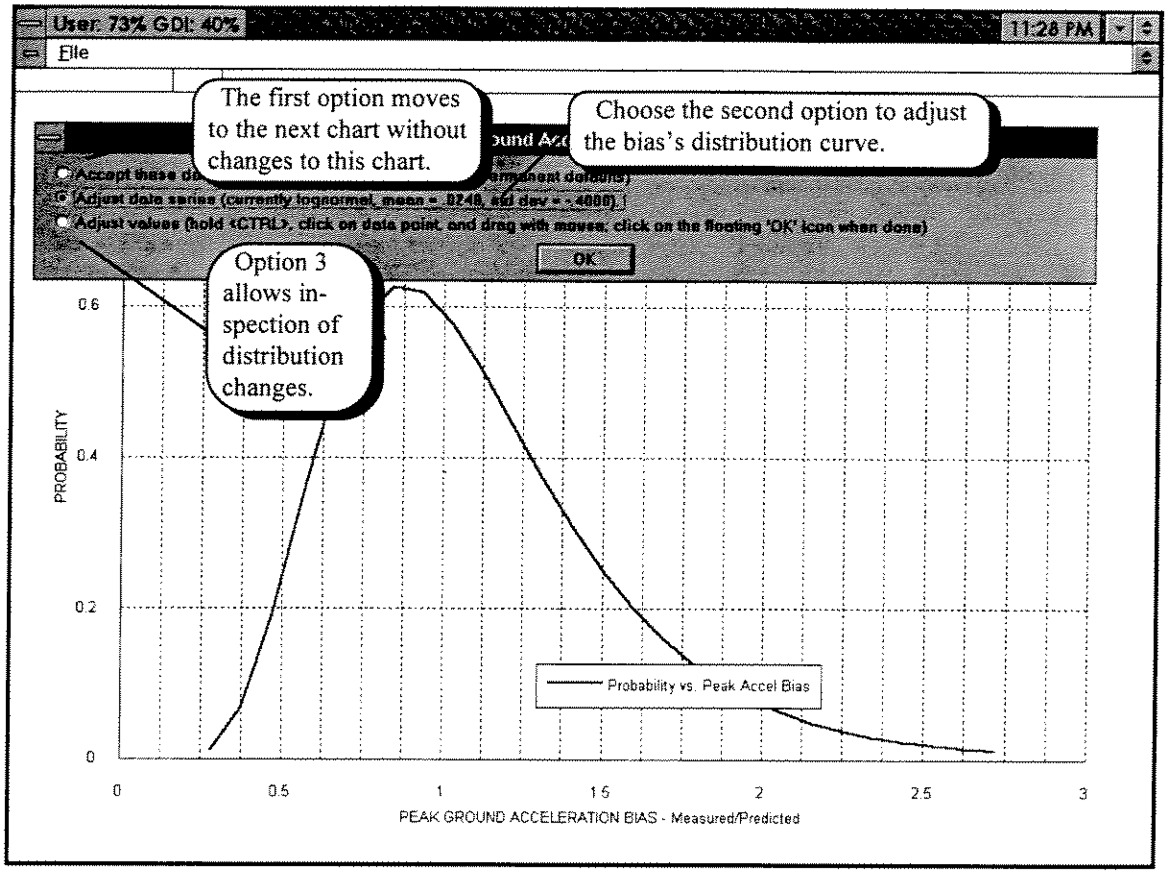

Figure 42
Ground Acceleration Bias input chart - adjustment options.

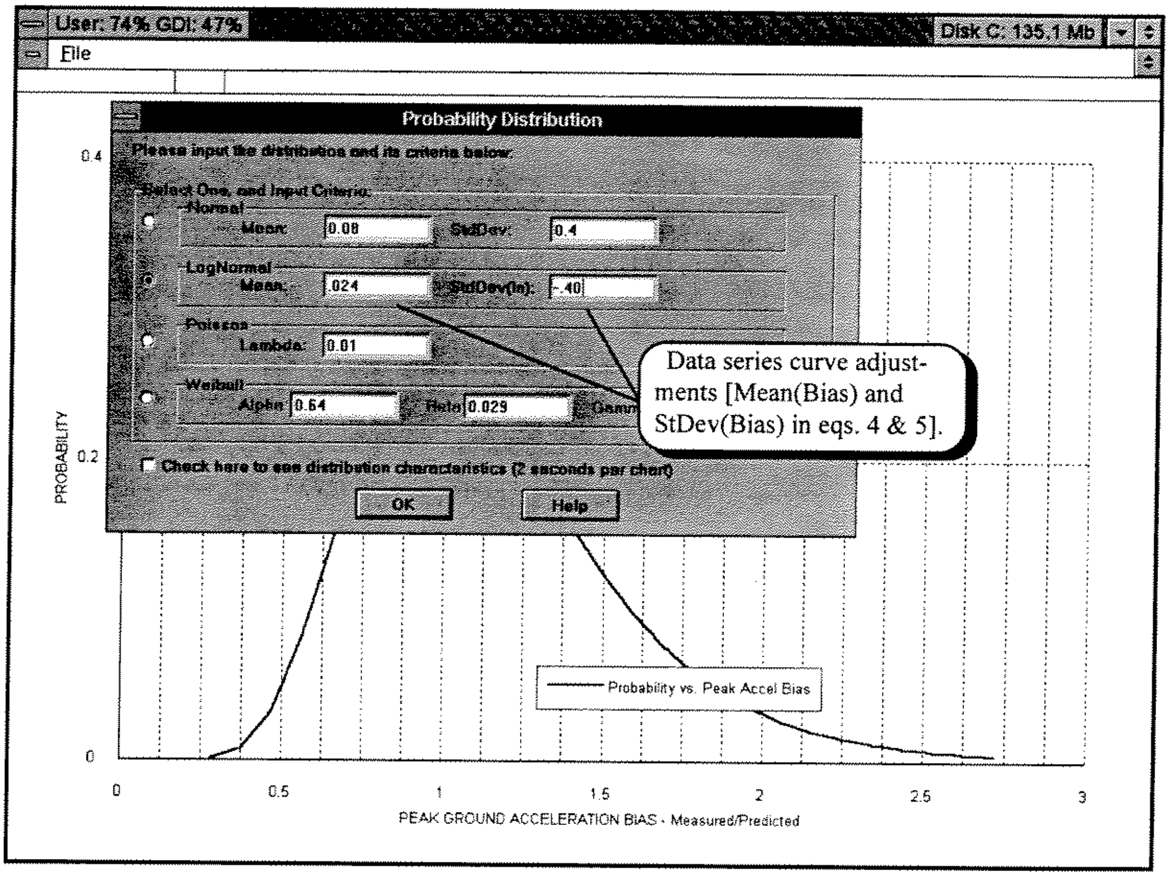

Figure 43
Ground Acceleration Bias input chart - changing bias distribution.

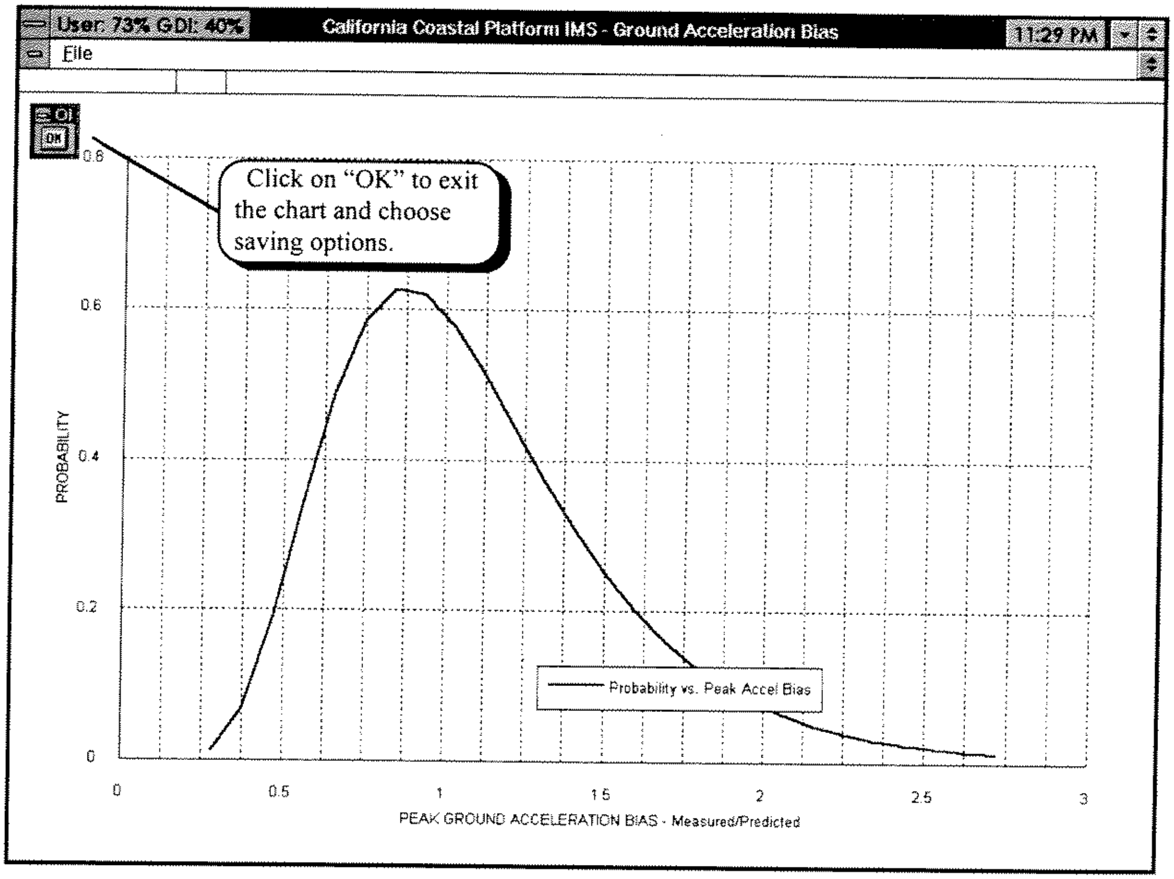

Figure 44
Ground Acceleration Bias input chart - exit screen.

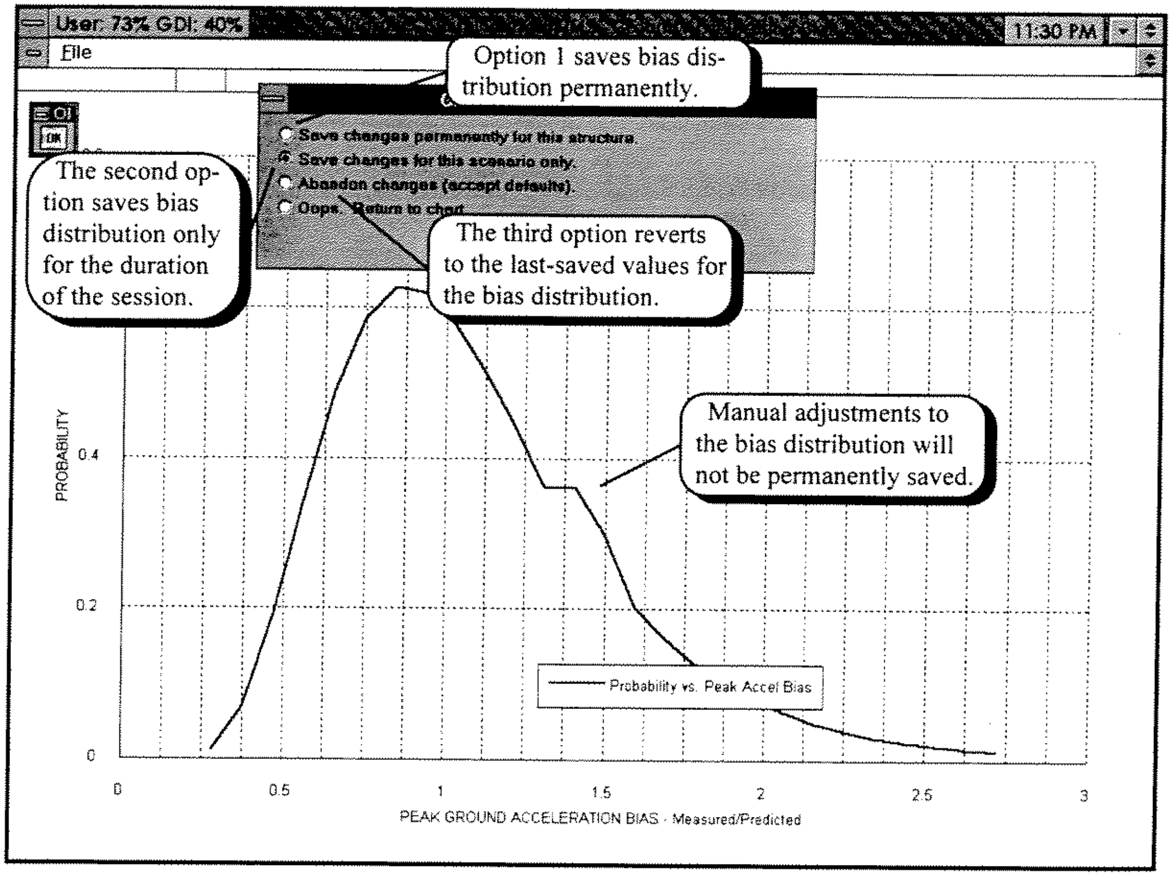

Figure 45
Ground Acceleration Bias input chart - saving options.

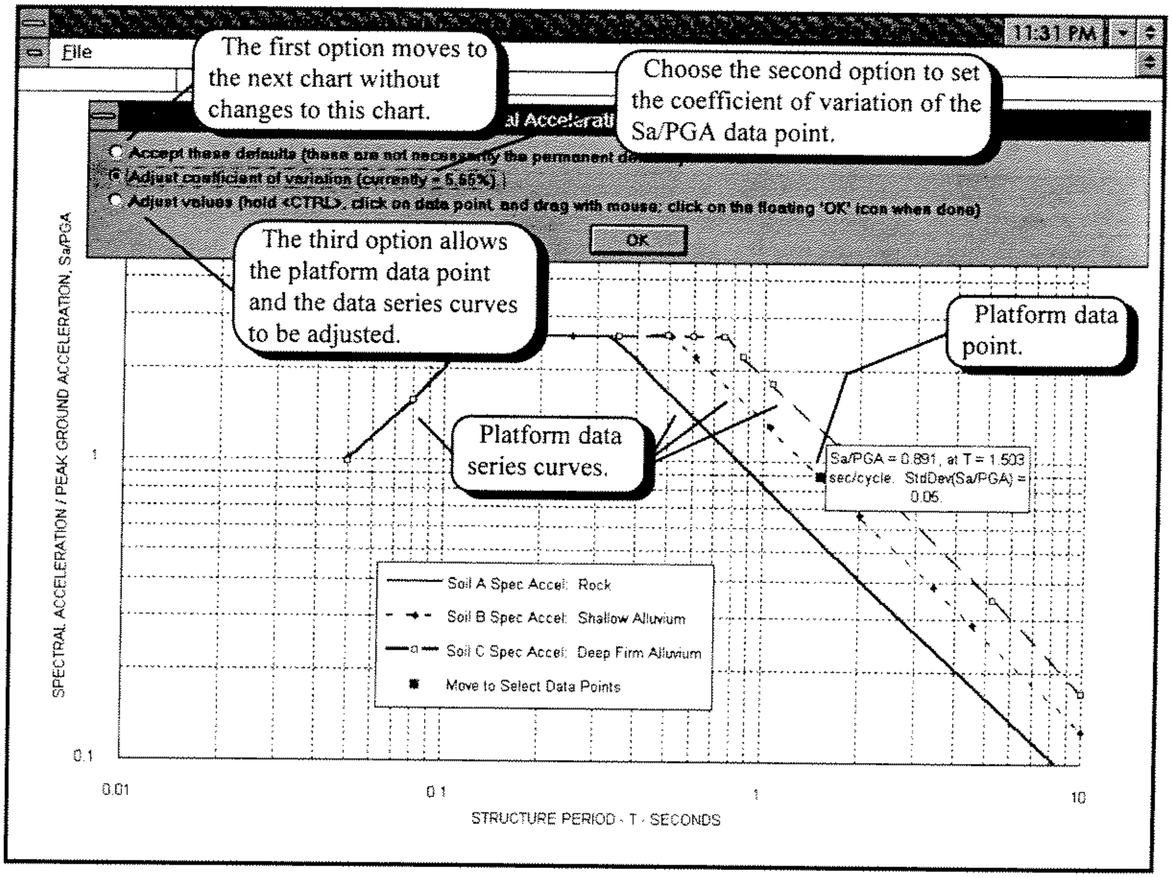

Figure 46
Spectral Acceleration/Ground Acceleration input chart - adjustment options.

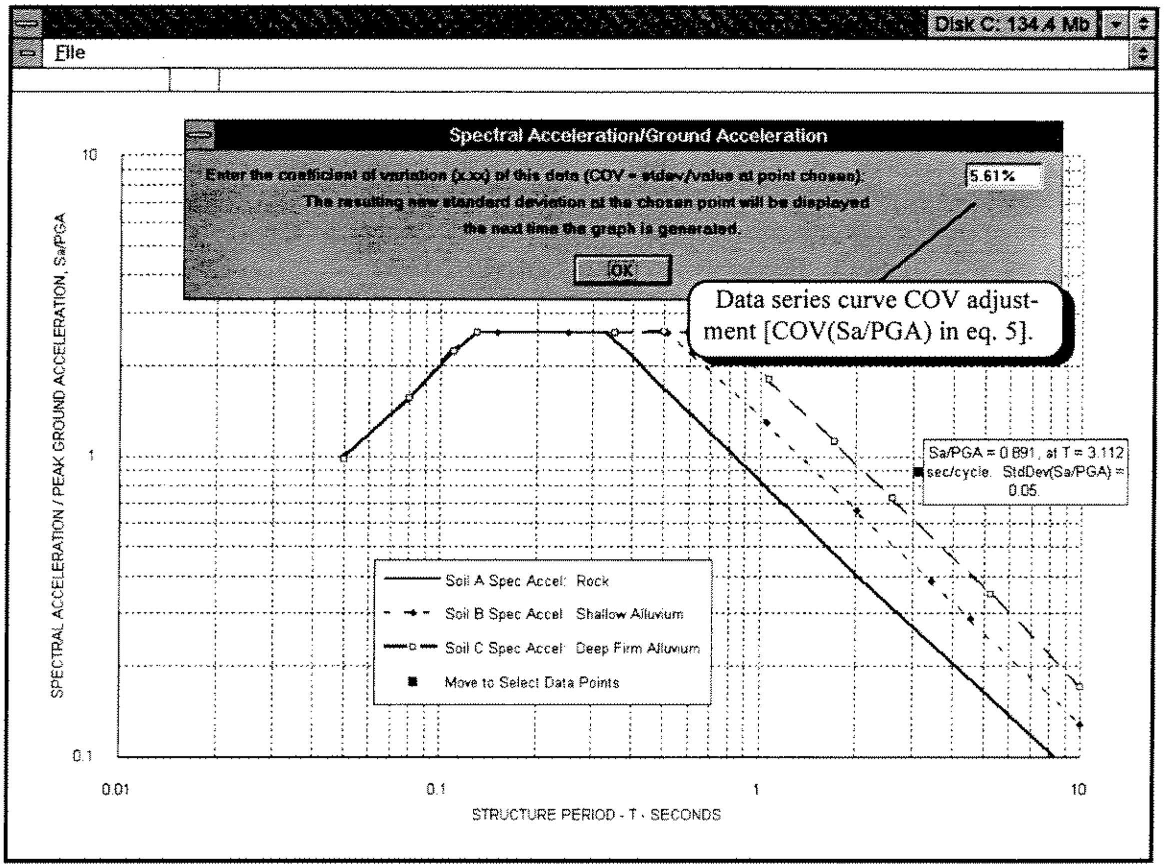

Figure 47
Spectral Acceleration/Ground Acceleration input chart - COV adjustment.

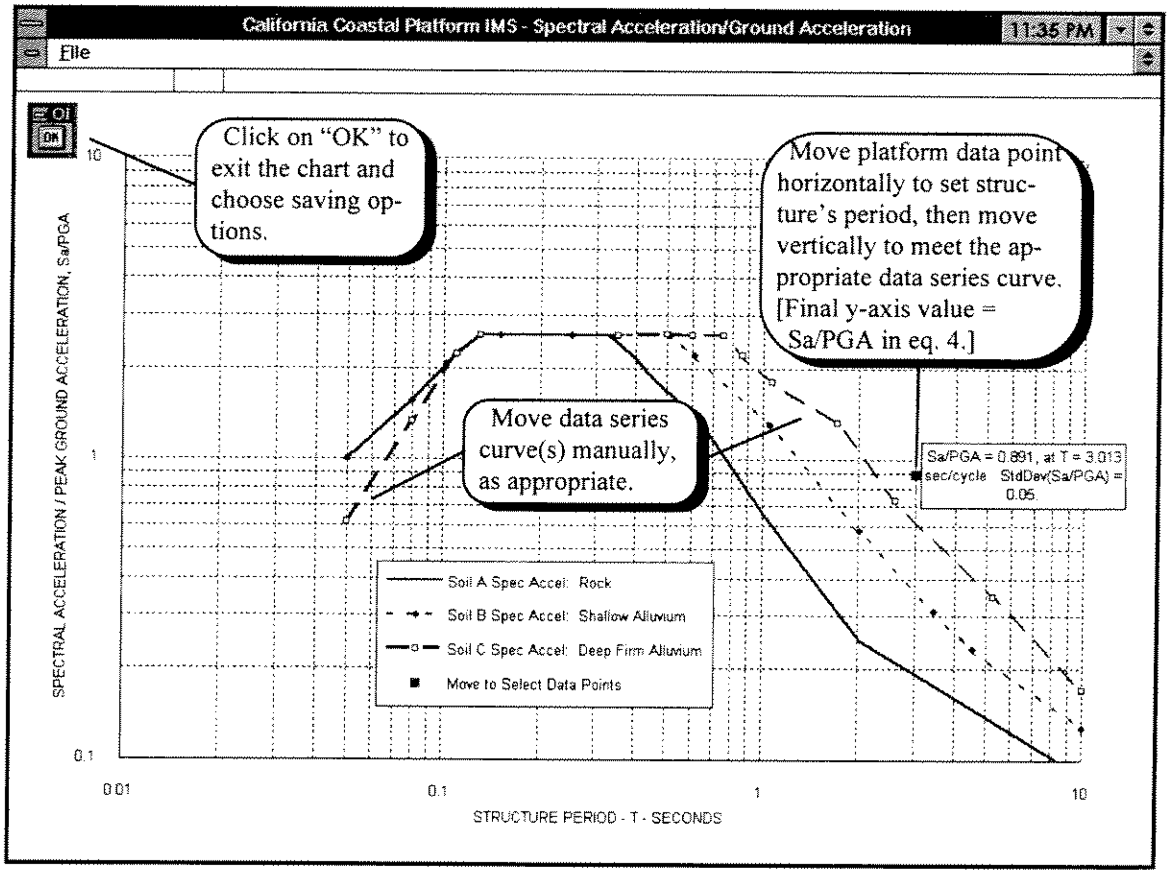

Figure 48
Spectral Acceleration/Ground Acceleration input chart - manual adjustment screen.

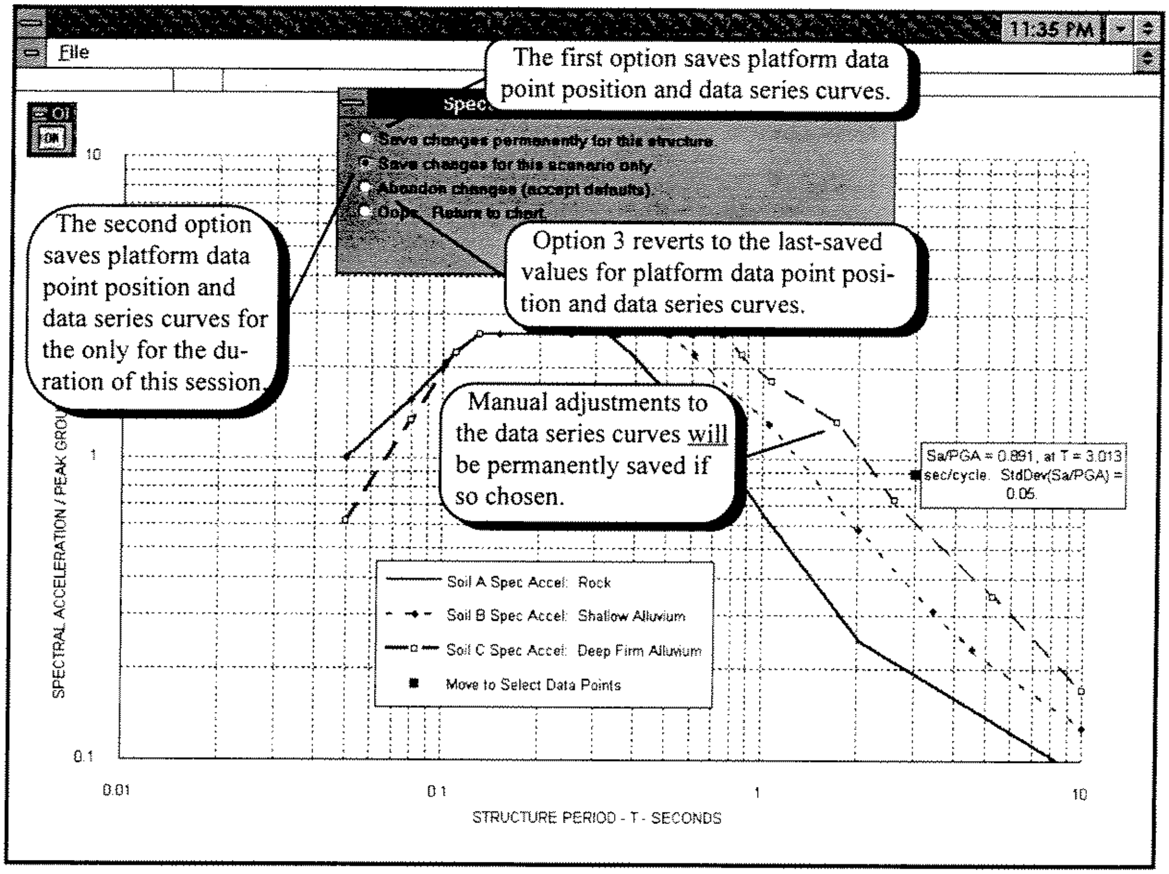

Figure 49
Spectral Acceleration/Ground Acceleration input chart - saving options.

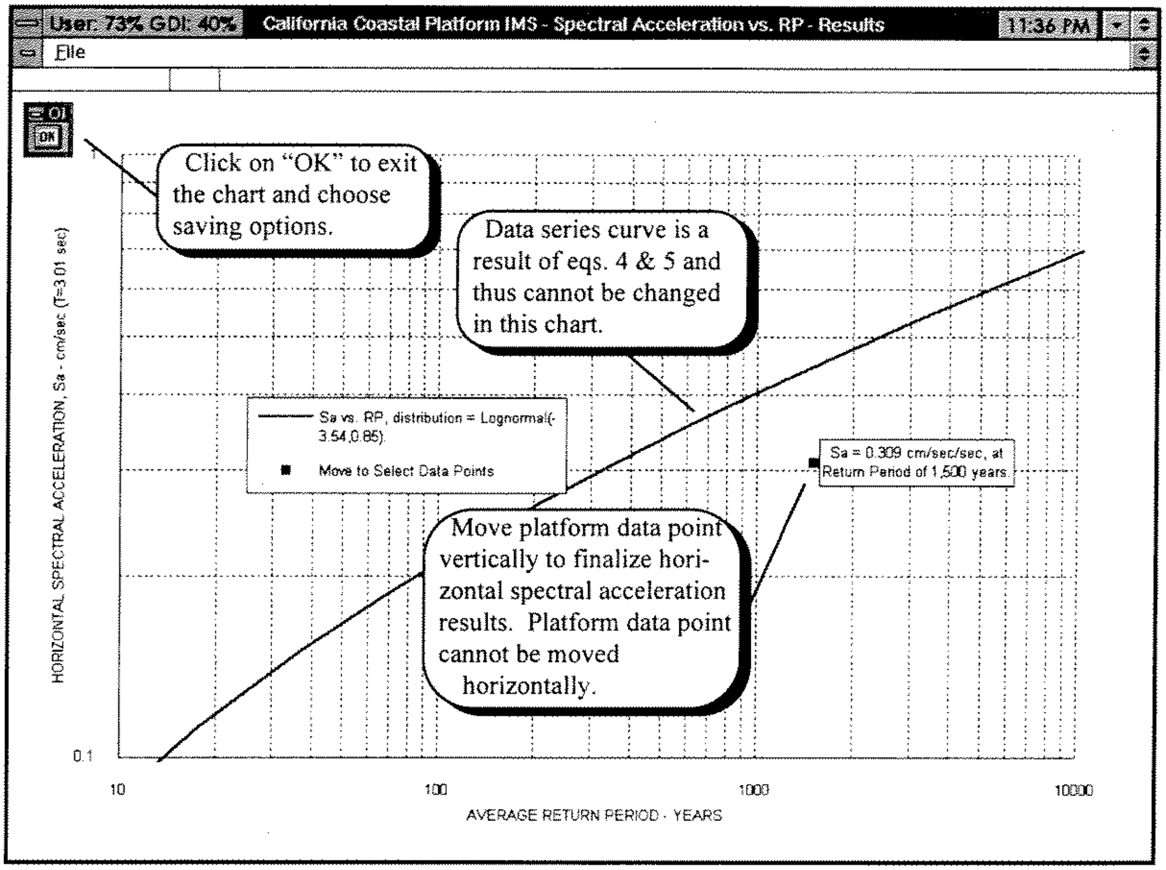

Figure 50
Spectral Acceleration vs. RP output chart - manual adjustment.

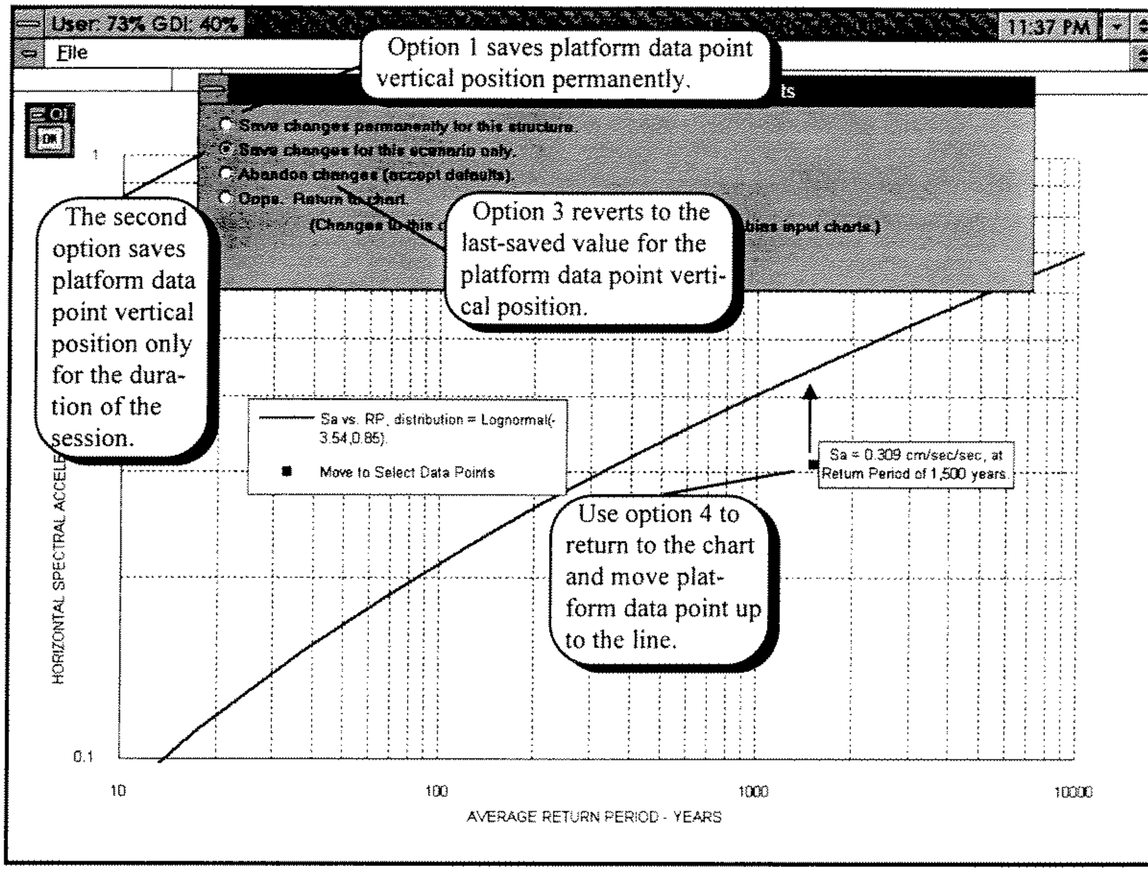

Figure 51
Spectral Acceleration vs. RP output chart - saving options.

Maximum wave height

In a manner similar to that used for ground acceleration data, the system graphically solicits and stores a probabilistic description of maximum wave height values expected per platform. This description is a function of the distribution of maximum wave height values at specified return periods, the bias in that distribution, and the maximum wave height to depth ratio for a specified water depth. The result is a probabilistic value for the maximum wave height.

The maximum wave height series, which begins after the user chooses the "Max. Wave Height" option in the Environmental Conditions menu, consists of three input charts ("Maximum Wave Height vs. Return Period," "Maximum Wave Height Bias," and "Wave Height/Depth Adjustment") and one output chart ("Maximum Wave Height vs.

RP - Results"). These charts are very similar to their Ground Acceleration counterparts seen in Figure 38 through Figure 51, and most of the comments seen in those figures apply to the maximum wave height case as well. The "Maximum Wave Height vs. Return Period" chart (Figure 52) is the first in the series to come up. This chart is used to enter the distribution of maximum wave height values at specified return periods, and to peg the return period to be used for this platform. The "Maximum Wave Height Bias" chart (Figure 53) is used to account probabilistically for biases in the wave height distribution; this chart is meant to handle both Type I (inherent) and Type II (modeling) biases, as combined into one function by the user.

The "Wave Height/Depth Adjustment" chart (Figure 54) is used to enter the ratio [wave height (at platform's water depth)/maximum wave height (in deep water)] as a function of platform water depth (where the water depth itself is retrieved from the platform's data file). Again, the wave height/depth adjustment function is meant to be altered manually, while the data functions in the first two graphs of the series are adjusted by changing their distributions.

The last wave height chart, "Maximum Wave Height vs. RP - Results," gives the distribution of maximum wave height values as a function of return periods (Figure 55). The distribution shown on this chart is a function of preceding charts, and thus cannot be changed. However, the user is cautioned to always remember to move the platform data point vertically to the curve of the distribution. It is this value which is the final output of the graphical series, and which will be retained by the system (should the option to save be chosen).

The distribution in the final, "Maximum Wave Height vs. RP - Results" graph is calculated as follows:

$$\text{Mean(Final Hmax)} = \text{Mean(Hmax)} + \text{Mean(Bias)} + \text{Ln(H / Hmax)} \tag{6}$$

$$\text{StDev(Final Hmax)} = \sqrt{(\text{StDev(Hmax)})^2 + (\text{StDev(Bias)})^2 + \left(\text{Ln}(1 + (\text{COV(H / Hmax)})^2\right)^2} \tag{7}$$

where the first term on the right-hand side of each equation comes from the "Maximum Wave Height vs. Return Period" chart, the second term comes from the "Maximum Wave Height Bias" chart, and the third term comes from the "Wave Height/Depth Adjustment" chart.

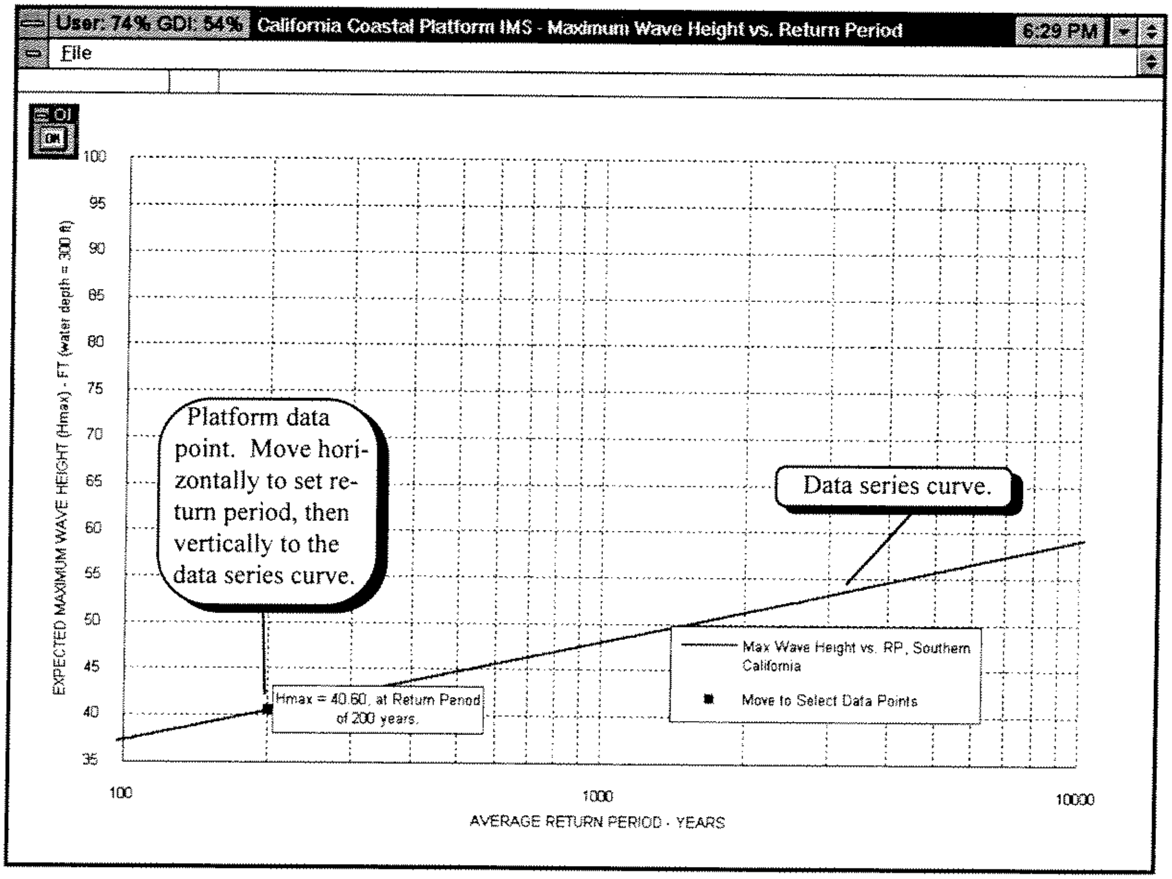

Figure 52
Maximum Wave Height vs. Return Period input chart.

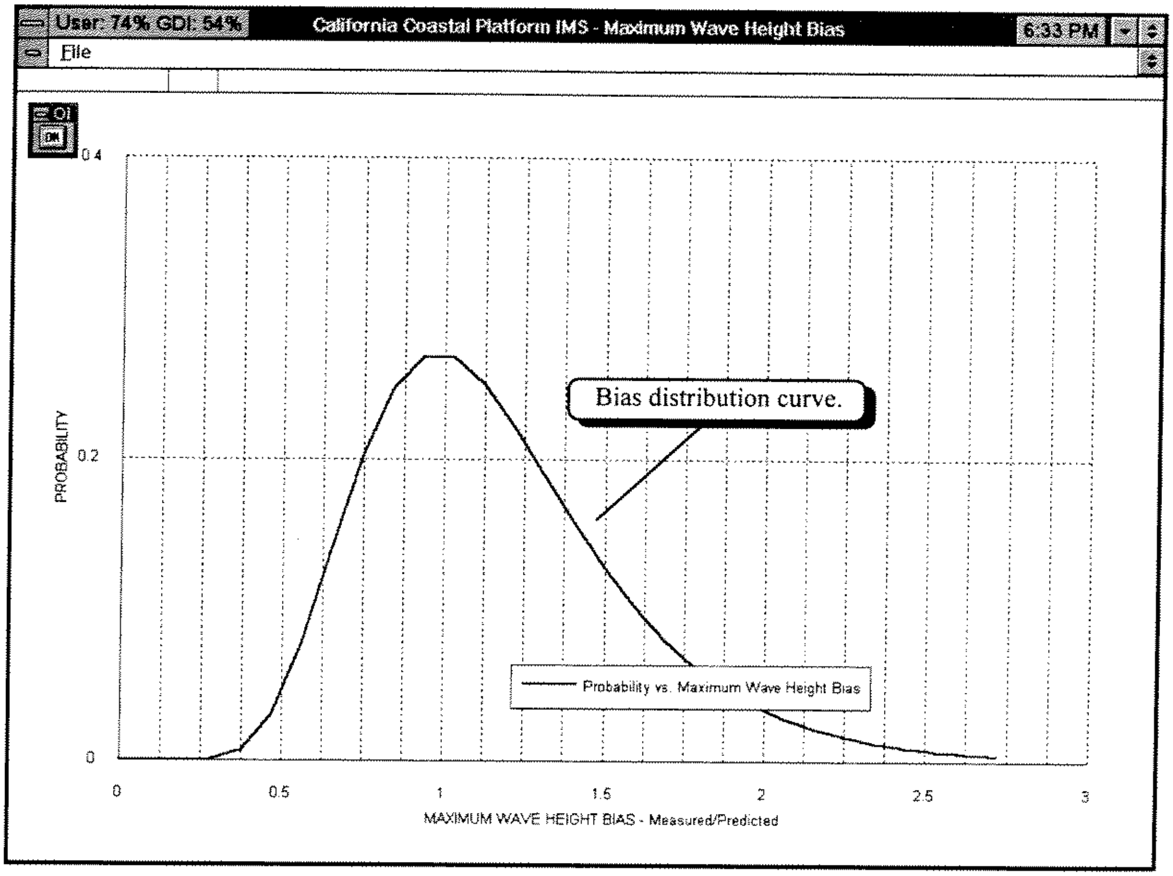

Figure 53
Maximum Wave Height Bias input chart.

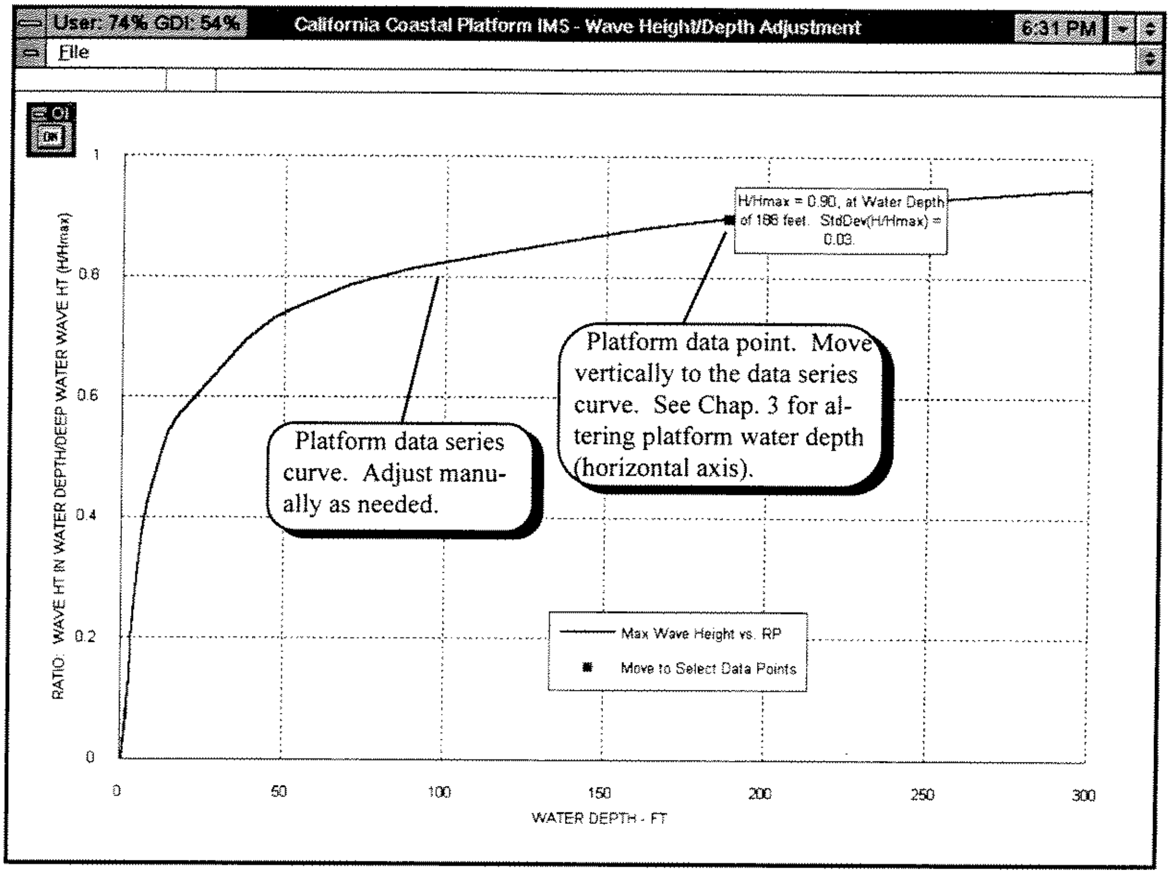

Figure 54
Wave Height/Depth Adjustment input chart.

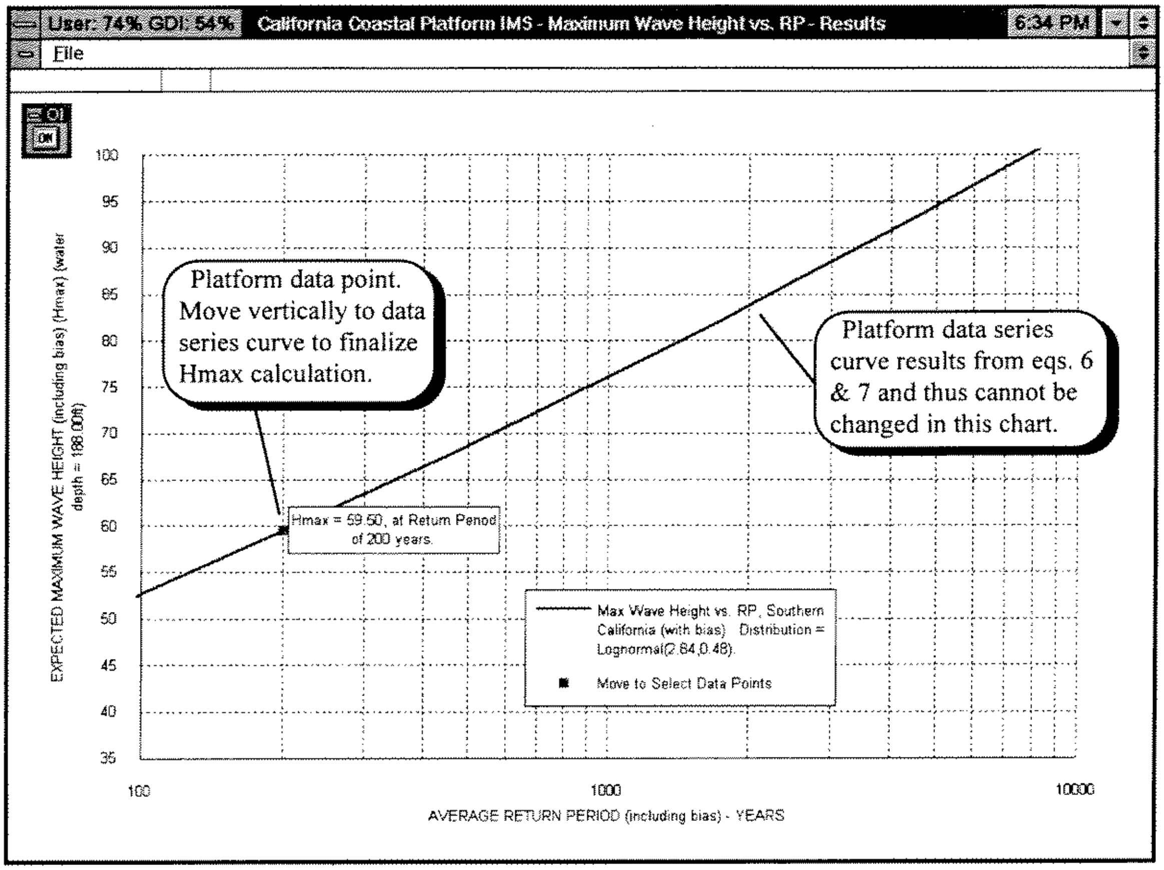

Figure 55
Maximum Wave Height vs. RP output chart.

Wind velocity

An expected maximum wind velocity value can also be developed and stored by the IMS. This is a function of maximum wave height (as developed in the maximum wave height series of charts). The result is a probabilistic value for maximum wind velocity.

The ground acceleration series initiates after the user chooses the "Maximum Wind Speed" option in the Environmental Conditions menu, and consists of one input chart ("Wind Speed given Wave Height"). This chart (see Figure 56 and Figure 57) is used to manually enter the function of maximum wind velocities at specified maximum wave heights, and to move the platform's data point vertically to intersect that function. The maximum wave height itself is set by the "Maximum Wave Height" chart series, and thus should be determined prior to setting wind velocities. The maximum wind velocity value set by the user in moving the platform data point is the value which is the final output of the graph, and which will be retained by the system (should the option to save be chosen). The user's confidence in this number is represented by the value established for the function's coefficient of variation (COV).

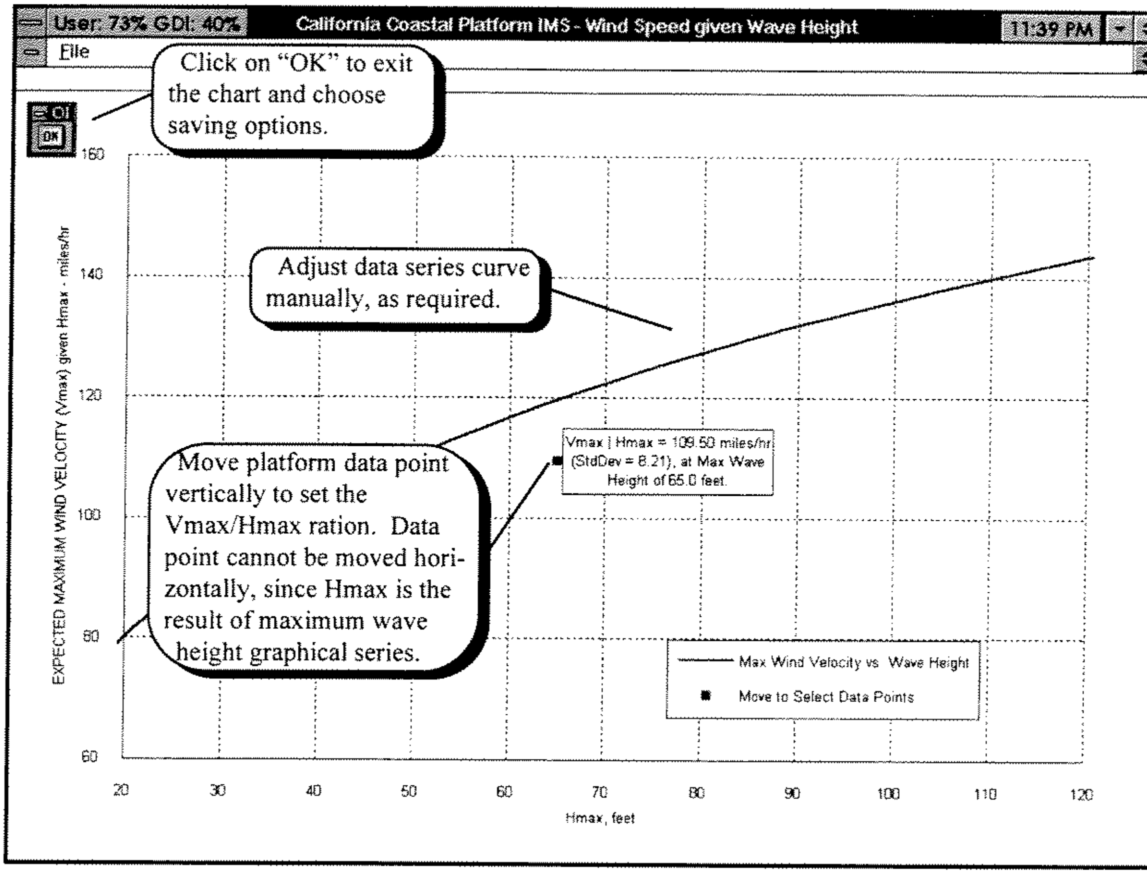

Figure 56
Wind Speed given Wave Height input chart - manual adjustment.

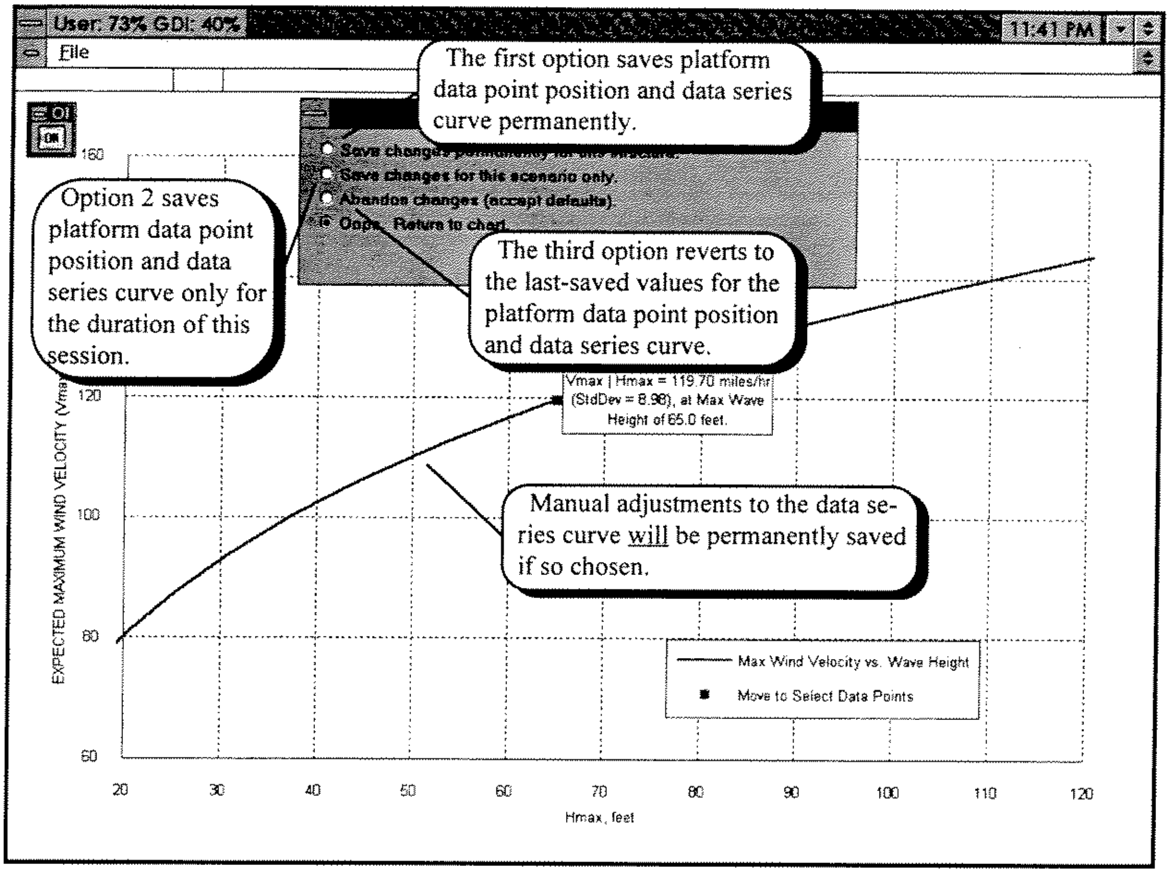

Figure 57
Wind Speed given Wave Height input chart - saving options.

Current velocity

An expected maximum current velocity value can also be developed and stored by the IMS. This is a function of maximum wave height (as developed in the maximum wave height series of charts). The result is a probabilistic value for maximum current velocity.

The ground acceleration series initiates after the user chooses the "Maximum Current Speed" option in the Environmental Conditions menu, and consists of one input chart ("Current Speed given Wave Height"). This chart is very similar to the wind velocity chart, and is used to manually enter the function of maximum current velocities at specified maximum wave heights (Figure 58). It is also used to move the platform's data point vertically to intersect that function. The maximum wave height itself is set by the "Maximum Wave Height" chart series, and thus should be determined prior to setting current velocities. The maximum current velocity value set by the user in moving the platform data point is the value which is the final output of the graph, and which will be retained by the system (should the option to save be chosen). The user's confidence in this number is represented by the value established for the function's coefficient of variation (COV).

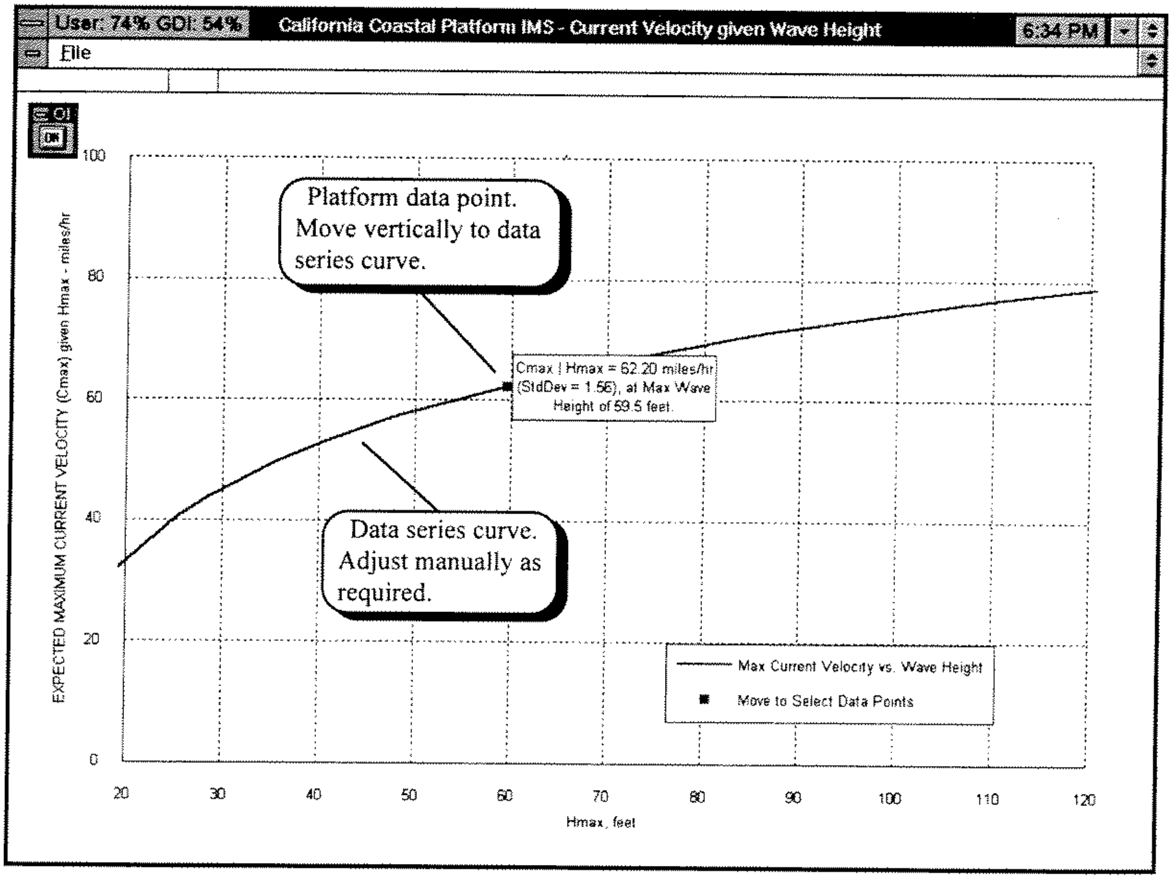

Figure 58
Current Velocity given Wave Height input chart

"Print" and "Save" functions in Environmental Conditions procedures

As in other sections of the program, all major Environmental Conditions elements include an option to print under the menu selection "File."

Changes made during the Environmental Conditions procedures are stored in a manner different to changes made in the Consequence Assessment, Structural Reliability Assessment, or Risk Assessment procedures. If the user chooses the option to "Save

Permanently" upon closing a chart, the data will be saved immediately to the pertinent platform data file. If the user chooses the "Save for This Scenario Only" option, the data will be retained in the temporary configuration worksheet for the duration of the operating session, but will not be saved unless the user chooses to do so when given the "Save Build2.XLS?" option upon closing the program. Note that some changes to *Build2.xls* - notably data series curves - will be retained as defaults, if saved, for all future platform analyses. If the user chooses the "Abandon Changes" option, changes to that chart will be immediately rewritten with data from the permanent platform data file.

The Environmental Conditions procedures also produce chart files, independently of the data that were chosen to be saved. The Ground Acceleration series produces chart files *Grndaccl.xlc*, *Grndbias.xlc*, *Soilaccl.xlc*, and *Specaccl.xlc* (in order); the Maximum Wave Height series produces *Hmax.xlc*, *Hmaxbias.xlc*, *Hmaxadj.xlc*, and *Hmaxresl.xlc*; the Wind Velocity procedure produces *Vmax.xlc*; and the Current Velocity procedure produces *Cmax.xlc*. Each of these files is rewritten every time a new version is produced. It is thus recommended that print-outs be obtained from the File menu, while the pertinent chart is open, rather than from a later session of Excel or File Manager.

Chapter 6: Future Development

The screening-cycle principles described in this report are applicable to many types of aging engineered structures - from dams to highway bridges to space satellites. It is the authors' intent to pursue these applications to their fullest in the years ahead.

The next immediate application of these principles will be to offshore petroleum structures in the Gulf of Mexico. This application is currently under development as "An Information Management System for the Reassessment of Offshore Platforms." This Gulf of Mexico IMS, in recognition of the special conditions of the Gulf, will feature advanced risk management techniques. Examples of these will be the assessment of changes in overall fleet risk, and graphical comparisons of the risks presented by multiple platforms.

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Appendix A: Modifications to files

File passwords

If the program is to be available for common use within an organization, then it is highly recommended that the following passwords be changed:

SG1.xla - entry password is "MMS"; not write-protected

Build2.xls - write-protection password is "SeaGrant" - hidden file

Level1.xls - write-protection password is "SeaGrant"

Util.xls - write-protection password is "SeaGrant"

L1Conseq.xls - write-protection password is "SeaGrant"

L1Conse1.xls - write-protection password is "SeaGrant"

L1Conse2.xls - write-protection password is "SeaGrant"

CA_Plat1.xls - write-protection password is "SeaGrant"

DistCalc.xls - not write-protected - hidden file

Permdata.xls - not write-protected - hidden file

SG1.ico - not write-protected

Logo.bmp - not write-protected

If passwords are changed on individual files, then they must also be changed on the *SG1.xla* macro sheet. To do this, open a normal session of Excel, open *SG1.xla* while depressing the [Shift] key, and replace all "SeaGrant" with the new password. Note that this requires using the same new password on all the other protected files as well.

Altering screening-cycle operations

As described in Chapter 4, the IMS is provided with multiple methods of performing both the consequence assessment and risk assessment procedures. In order to provide consistent results within an organization, it is necessary to select or modify one method for each procedure and then to eliminate the other options.

To do this, first select or modify a method for use (refer to Chapter 4 and to Figure 31). (For the consequence assessment procedure, if a modified version of file

L1Conse1.xls is chosen, be sure to open the modified file in a separate session of Excel and extend its password protection to all cells except the input cells. For the risk assessment procedure, modifications to the tabular consolidation option can be made directly on *SG1.xla* - cells AI116 to AI287 - while modifications to utility functions are described in Chapter 4.) Next, run the IMS and make sure that all options are set as desired. Now, open *SG1.xla* and go to cell AI442, which contains the formula "=ChangeMenu(3,L1CAMenu,L1CASetupMenu1,L1CASetupMenu2)". To eliminate the choice of consequence analysis options, change cell AI442 to read "=ChangeMenu(2,L1CAMenu,L1CASetupMenu2)". To eliminate the choice of risk analysis options, change AI442 to "=ChangeMenu(2,L1CAMenu,L1CASetupMenu1)". To delete both options, change AI442 to "=ChangeMenu(1,L1CAMenu)".

Appendix B: Data listings for platforms

Name	Latitude	Longitude	Notes	Operator
A	34.331944	-119.612500		UNION
B	34.332500	-119.621667		UNION
C	34.333056	-119.630833		UNION
EDITH				CHEVRON
ELLEN				SHELL
ELLY			PRODUCTION FACILITY	SHELL
EMMY	33.662222	-118.043611		AMINOIL
ESTHER				
EUREKA				SHELL
EVA	33.661667	-118.061111		UNION
GAIL	34.125000	-119.400278		CHEVRON
GILDA	34.182222	-119.418611		UNION
GINA	34.117500	-119.276389		UNION
GRACE	34.179444	-119.467778		CHEVRON
HABITAT				TEXACO
HACIENDA				CHEVRON
HARMONY	34.376944	-120.167500		
HARVEST	34.469167	-120.679444		TEXACO
HAZEL	34.382222	-119.566944		CHEVRON
HEIDI	34.342500	-119.518611		CHEVRON
HENRY	34.333333	-119.560278		SUN
HERCULES				SHELL
HERITAGE	34.350000	-120.279167		
HERMOSA	34.455556	-120.646389		CHEVRON
HERON				ARCO
HIDALGO	34.495000	-120.702222		CHEVRON
HILDA	34.388333	-119.595000		CHEVRON
HILLHOUSE	34.331389	-119.603333		SUN
HOGAN	34.337500	-119.541111		PHILLIPS
HOLLY	34.390000	-119.905278		ARCO
HONDO A	34.390833	-120.120556		EXXON
HONDO B				EXXON
HOPE	34.340556	-119.530278		CHEVRON
HOUCHIN	34.335000	-119.552222		PHILLIPS
IRENE	34.610278	-120.729444		UNION

Name	Lease #	Slots	H2O Depth	Miles to Land	Lambert E
A	P-0241	56	188	6.1	984,865
B	P-0241	62	188	6.1	981,955
C	P-0241	59	193	6.1	979,353
EDITH	P-0296	72	160	8.5	1,084,062
ELLEN	P-0300	80	265	8.7	1,428,175
ELLY	P-0300	0	255		1,428,325
EMMY	PRC 425	53	47	1.3	1,454,245
ESTHER					
EUREKA	P-0301	60	700	9.0	1,431,432
EVA	PRC 3033	53	57	2.1	1,448,916
GAIL	P-0205	36	739	9.8	1,046,600
GILDA	P-0216	96	210	8.7	1,041,760
GINA	P-0202	15	95	4.0	1,084,062
GRACE	P-0217	48	318	10.4	1,026,770
HABITAT	P-0243	24	285	8.5	991,690
HACIENDA	P-0451		300	4.5	715,848
HARMONY					0
HARVEST	P-0315	50	670	11.9	665,024
HAZEL	PRC 1824	25	100	2.1	999,196
HEIDI	PRC 3150	60	125	3.0	1,013,306
HENRY	P-0240	30	160	4.5	1,000,596
HERCULES	PRC 2920	64	237	2.5	819,524
HERITAGE					0
HERMOSA	P-0316	48	602	10.2	674,750
HERON	PRC308	80	220	2.0	822,888
HIDALGO	P-0450	56	430	6.2	710,480
HILDA	PRC 1824	36	106	1.9	990,810
HILLHOUSE	P-0240	60	190	5.9	987,755
HOGAN	P-0166	66	154	3.8	1,006,500
HOLLY	PRC 3242	30	211	2.1	897,228
HONDO A	P-0188	28	850	5.1	832,517
HONDO B	P-0190	60	1200	6.3	817,960
HOPE	PRC 3150	60	136	3.3	1,009,622
HOUCHIN	P-0166	60	150	4.2	1,003,115
IRENE	P-0441	72	250	5.0	708,300
JULIUS	P-0409	70	478	9.5	698,031

Name	Lambert N	Installed	1st Production	Type
A	804,224	1/1/68	3/3/69	PLATFORM
B	804,030	1/1/68	7/13/70	PLATFORM
C	804,770	1/1/77	8/1/77	PLATFORM
EDITH	723,005	1/1/83	1/21/84	PLATFORM
ELLEN	520,220	1/1/80	1/13/81	PLATFORM
ELLY	5,206,000	1/1/80		PLATFORM
EMMY	548,870	1/1/61		PLATFORM
ESTHER				
EUREKA	513,421	1/1/84	3/17/85	PLATFORM
EVA	548,783	1/1/64		PLATFORM
GAIL	728,490	1/1/87	9/19/88	PLATFORM
GILDA	747,980	1/1/81	12/19/81	PLATFORM
GINA	723,005	1/1/80	2/11/82	PLATFORM
GRACE	747,480	1/1/79	7/25/80	PLATFORM
HABITAT	787,500	1/1/81	12/15/83	PLATFORM
HACIENDA	3,819,767			PLATFORM
HARMONY	0	1/1/89		
HARVEST	866,235	1/1/85	6/3/91	PLATFORM
HAZEL	822,464	1/1/58		PLATFORM
HEIDI	807,157	4/1/66		PLATFORM
HENRY	805,219	1/1/79	3/16/80	PLATFORM
HERCULES	849,420			PLATFORM
HERITAGE	0	1/1/89		
HERMOSA	860,770	1/1/85	6/9/91	PLATFORM
HERON	910,604			PLATFORM
HIDALGO	3,819,360	1/1/86	5/27/91	PLATFORM
HILDA	824,753	1/1/60		PLATFORM
HILLHOUSE	803,936	1/1/69	7/21/70	PLATFORM
HOGAN	805,200	1/1/67	6/10/68	PLATFORM
HOLLY	828,267	1/1/66		PLATFORM
HONDO A	830,859	1/1/76	4/2/81	PLATFORM
HONDO B	826,503			PLATFORM
HOPE	806,678	11/1/65		PLATFORM
HOUCHIN	804,772	1/1/68	4/28/69	PLATFORM
IRENE	3,831,800	1/1/85	4/13/87	PLATFORM

Name	Location	MBBL Daily	MMCF Daily	Status 1989
A	SB CHANNEL	4.50	2.50	PRODUCING
B	SB CHANNEL	3.20	2.30	PRODUCING
C	SB CHANNEL	1.50	0.68	PRODUCING
EDITH	SAN PEDRO BAY	0.96	0.57	PRODUCING
ELLEN	SAN PEDRO BAY	5.50	1.30	PRODUCING
ELLY	SAN PEDRO BAY			PROCESSING
ESTHER				
EMMY	SAN PEDRO BAY	9.80	1.90	PRODUCING
EUREKA	SAN PEDRO BAY	9.90	1.70	PRODUCING
EVA	SAN PEDRO BAY			PRODUCING
GAIL	SB CHANNEL	0.60	1.20	PRODUCING
GILDA	SB CHANNEL	5.10	7.70	PRODUCING
GINA	SB CHANNEL	1.60	0.40	PRODUCING
GRACE	SB CHANNEL	1.40	3.10	PRODUCING
HABITAT	SB CHANNEL	0.04	45.60	PRODUCING
HACIENDA	SANTA MARIA BAS			
HARMONY				
HARVEST	SB CHANNEL			DEVELOPMENT
HAZEL	SB CHANNEL			
HEIDI	SB CHANNEL			PRODUCING
HENRY	SB CHANNEL	3.80	1.80	PRODUCING
HERCULES	SB CHANNEL			
HERITAGE				
HERMOSA	SB CHANNEL			DEVELOPMENT
HERON	SB CHANNEL			
HIDALGO	SANTA MARIA BAS			DEVELOPMENT
HILDA	SB CHANNEL	0.53	1.10	PRODUCING
HILLHOUSE	SB CHANNEL	3.00	2.20	PRODUCING
HOGAN	SB CHANNEL	0.48	0.54	PRODUCING
HOLLY	SB CHANNEL	7.00	6.00	PRODUCING
HONDO A	SB CHANNEL	27.00	57.50	PRODUCING
HONDO B	SB CHANNEL			
HOPE	SB CHANNEL	2.00	4.60	PRODUCING
HOUCHIN	SB CHANNEL	1.50	1.80	PRODUCING
IRENE	SANTA MARIA BAS	17.00	3.40	PRODUCING

Appendix C: Advanced setup

Running the California Information Management System from the Windows icon incurs a lot of overhead - from Program Manager, other accessory programs, and whatever TSRs you might normally load. However, the IMS can be run directly from the DOS prompt. Doing so results in a more elegant operating session and consumes roughly 12% fewer system USER resources.

To begin, install the IMS in the normal fashion, described in "Software Installation Procedures" above. Then exit Windows. Change to the Windows directory, and make backup copies of both *WIN.INI* and *SYSTEM.INI*. Using a text editor, change the "Shell=Progman.exe" line of *SYSTEM.INI* to "Shell=C:\Windows\Excel\Excel.exe" (making sure to use the correct path for your particular Excel installation). Save this altered file as *SYS_SG.INI*. Open *WIN.INI* and change (or add, under the [Desktop] section) the "Wallpaper=" line to "Wallpaper=C:\Research\Seagrant\Logo.bmp" (making sure to use the correct path for your IMS installation). Save this altered file as *WIN_SG.INI*. (Changes to *WIN.INI* are optional for those systems with low memory.)

Now create a new file, *SG1.BAT*. Type in the following lines:

```
cd \windows
copy system.ini system.org
copy sys_sg.ini system.ini
copy win.ini win.org   (optional)
copy win_sg.ini win.ini   (optional)
cd \research\seagrant
win sg1.xla
REM pause
cd \windows
copy system.org system.ini
copy win.org win.ini   (optional)
```

Save this new file to directory that's in your path statement (such as C:\ , or C:\BAT). Now, in addition to starting the IMS from Windows, you can start it from DOS. Simply type `SG1` at the DOS prompt, and the batch file will switch *.ini* files and start the IMS. When you exit the IMS, Windows will close and the batch file will reset the *.ini* files.