

UFIM *TM*

Utility
Fuel
Inventory
Model

Version 4.0 USER'S MANUAL

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UFIMTM
Utility Fuel Inventory Model

Version 4.0 User's Manual

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October 2003

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ABSTRACT

The Utility Fuel Inventory Model (UFIM) is a tool intended to help power companies develop reasonable, low-cost fuel inventory policies. The principal goal of inventory management is to balance the cost of building and maintaining fuel reserves against the risk of running out of fuel. UFIM uses analytic techniques to provide utilities with insights about how to strike this balance.

UFIM was originally designed for running on mainframe computers and then converted to run on your PC under the MS-DOS operating system. Version 4.0 was created so that the program would run under modern windows operating systems. The new user interface is a standard Windows implementation. In addition the calculation engine was converted from Fortran to C++.

Please note that the underlying algorithms and calculations in UFIM have not changed.

ABOUT THE DOCUMENTATION

The purpose of this documentation is to describe the new Windows user interface incorporated in UFIM Version 4.0. This document also provides instructions for installing UFIM on your PC. This document complements, and does not replace, the standard UFIM documentation, which remains unchanged from Version 3.0 and earlier.

The original UFIM documentation consisted of a single binder containing two volumes: “UFIM Basic Concepts” and “UFIM User’s Guide.” The purpose of the “UFIM Basic Concepts” volume was to discuss the general nature of the inventory problem, to describe the features of UFIM, and to provide interested planners and decision makers with sample applications of the model. A companion volume, the “UFIM User’s Guide,” provided detailed descriptions of the computer model input and output sets, both for the mainframe version of the model and the original personal computer counterpart.

This update documentation replaces the information in the “UFIM User’s Guide.” An electronic version of the “UFIM Basic Concepts” volume is distributed with the Version 4.0 software and can be accessed from the help menu.

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TABLE OF CONTENTS

ABSTRACT	v
ABOUT THE DOCUMENTATION	vii
TO GET HELP	ix
1 INTRODUCTION	1
1.1 Installing the Model	1
1.2 Learning to Use the Model	2
1.3 What's New	2
1.4 Error Traps	3
1.5 Contacting Us	4
2 USING THE UFIM USER INTERFACE	5
2.1 Introduction	5
2.2 Running the Model	5
2.3 The File Menu	8
2.4 The Edit Menu	9
2.4.1 Editing Case Data	9
2.4.2 Editing Run Specifications	11
2.4.3 Advanced User Parameters	11
2.5 Run Case Menu	12
2.5.1 Run Current Case	12
2.5.2 Run Multiple Cases	14
2.6 Results Menu	14
2.6.1 View Results	14
2.6.2 Export to Spreadsheet	16
2.6.3 Delete Results	16
2.7 Help Menu	16

LIST OF FIGURES

2-1	UFIM Program Icon	5
2-2	Select Case	6
2-3	Open Case	7
2-4	Main Screen	7
2-5	Main Screen With File Menu Open	8
2-6	Edit Menu - Editing Case Data	9
2-7	Edit Menu - Editing Run Specifications	11
2-8	Run Case Menu Options	12
2-9	Run Case Dialog Box	12
2-10	Run Log Report	13
2-11	Input Form for Selecting Multiple Cases to Run	14
2-12	Results Menu With The View Results Option Selected	15
2-13	View Results Options	15
2-14	Help Menu Options	16

1 INTRODUCTION

This User's Manual provides descriptions of the inputs and outputs for the UFIM Version 4.0 software. This chapter provides instructions on installing the model, how to learn to use the model, and brief description of how Version 4.0 differs from earlier versions. Chapter 2 describes the user interface and specifically describes the inputs and outputs.

1.1 Installing the Model

The accompanying CD disk contains the setup program that will install the model. The system requirements for the model are:

- Windows 98 SE/Win ME/ Win NT/ Win 2000/ Win XP,
- 64mb of RAM,
- 100mb of free space on a hard drive,
- Acrobat Reader 4.0 installed on the host machine.

The model uses Acrobat Reader to display the help file. If the user does not have Reader it can be downloaded for free from Adobe's web site (www.adobe.com).

To install the model insert the disk in the CD-ROM drive. If the setup program does not start automatically, click *START*, select *Run*, enter *D : /SETUP* in the dialog box and click OK (if *D :* is not the drive identifier for the CD-ROM, enter the appropriate drive identifier). Then, follow the directions on the screen to complete the setup. Unless the user specifies otherwise during installation, the program, reports and database files are placed in the folder *c : /ProgramFiles/EPRI/UFIM*. The DLL files are placed in the directory *c : /windows/system*. (NOTE: For Windows NT and Windows 2000, *windows* directory is *winnt*)

To uninstall the model click *START*, select *ControlPanel*, select *AddorRemovePrograms* from the list, select *UFIM* from the list, click the Remove button. When ask "Are you sure you want to remove *UFIM* from your computer," click the *Yes* button. When done close the *AddorRemovePrograms* window and the *Control Panel* window.

Note: Administrative privileges are required to install the application on Windows NT 4.0, XP and 2000

The database *Sample.mdb* is distributed with the program. This database is automatically opened when the program is started. The database includes two cases - *Non – seasonal* and *Seasonal*. The Seasonal case is the basis for the screen shots used in Chapter 2. To verify that the model is correctly installed and working, the user can run the Seasonal case and compare the outputs with the screen shots in Chapter 2.

Note: when the program is run it automatically opens the last database created by the user. The first time the model is run the database will be *Sample.mdb*, the database distributed with the program.

In the next Chapter 2 we explain the details of running the model including entering data and reviewing output reports.

1.2 Learning to Use the Model

UFIMTM is an easy model to use. If the user is not familiar with the model we recommend the following five steps as an efficient way to become familiar with (1) the mechanics of running the model and (2) the methodology that underlies the model calculations:

1. Review Chapter 2 to become familiar with the user interface, the input data, and the outputs.
2. Study the inputs for both the Seasonal and Non-Seasonal cases supplied with the Version 4.0.
3. Run the Seasonal and Non-Seasonal cases and study the outputs.
4. Read Chapter 3, of the “UFIM Basic Concepts” volume, ”Getting Started With UFIM,” The manual is distributed with the software and can be opened from the *Help* menu.
5. Prepare a case based on the problem described in Chapter 3 of the User’s Manual.

1.3 What’s New

Version 4.0 reproduces the calculation capability of Version 3.1. A modern Windows interface was added and the software was rewritten in *C++* to take advantage of increased speed and improved memory management. Context

sensitive is available for all input fields. Placing the cursor in any field and pressing *F1* will activate the help.

1.4 Error Traps

The software traps most data inconsistencies at the user interface level. However, there are certain situations where error conditions are recognized only after the model is processing the data. In order to ensure robustness of the software, the software traps run-time generated errors and reports them back to the user in a Window as a RUN-TIME ERROR. When this happens the user is asked click OK and the model returns to the main window.

In some (hopefully rare!) instances, the error message is one that should not have occurred and occurs only because of an internal inconsistency in the software. In this case, the names and phone numbers of contacts at EPRI and Stanford Business Software, Inc. (SBSI) will be displayed. Please contact at least one of the support organizations with the exact message as it appears on your screen.

In other situations, the error message will point you in the right direction and you can attempt to modify the data for the case and re-run the model (after restarting the software). However, in this case too, should the message be unclear or if you have any questions, please do not hesitate to contact EPRI or SBSI.

1.5 Contacting Us

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2 USING THE UFIM USER INTERFACE

2.1 Introduction

This Chapter describes the *UFIM* user interface and the way inputs and outputs are handled by the interface. The user interface is a standard Windows implementation. It was written in Visual Basic and output reports are created as text files. Because of the Windows implementation, users should be able to edit data sets, run the model and view results with little or no reference to this User Guide. However the modeling process requires considerable thought and it is highly recommended that model users carefully study the methodology described in the *UFIM Basic Concepts* volume.

2.2 Running the Model

To run the model click *START*, select *Program*, and highlight the *UFIM4.0* program, and click/double-click the program icon. The program icon is simplified tree structure. Figure 2-1 is an enlarged picture of the icon. The user can also open the program by double clicking the Project Prioritization System program icon on the *DESKTOP*.

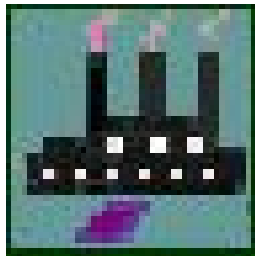


Figure 2-1: UFIM Program Icon

When the model is started, a start-up window is displayed. This screen has the name of the program, the version number, and the list of individuals that developed the program. The user can click any key to close the start-up screen.

Once the opening screen is closed, the *LicenseNotice* window is displayed until the user click any key. Once the license notice disappears, the model finds the default database installed with the program (*Sample.mdb*) and opens the database. If the model cannot find the database, a window will popup and ask user to browse and specify the database path. (Default directory to be searched is *c : /ProgramFiles/EPRI/UFIM*). Following this, the window for Select Case is displayed as in Figure 2-2. This window gives the user the option to select an existing case or create a new case. Initially, if no cases are entered, Work on existing Case is grayed out. If cases already exist in the database, the Work on existing Case option is enabled. This window is shown below.

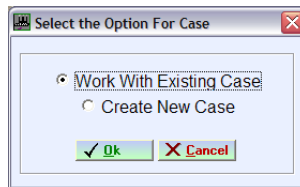


Figure 2-2: Select Case

If the user selects *Work on Existing Case*, a window is opened that allows the user to select the case from a list. If *Create New Case* is selected, a window is opened that allows the user to specify a new case a name and description.

If database has one or more cases, and the *Work on Existing Case* option in Figure 2-2 is selected, a popup window shows all the cases in the database. The user can select any of the cases and the model will open the corresponding case. The case used by the program is displayed at the top of the main screen. Figure 2-3 shows the window displayed to open a case.

After an existing case is selected or a new case created, the main window is displayed as shown in Figure 2-4.

Using the main window menu system you can perform file functions, edit cases, run cases, view results and open the documentation.

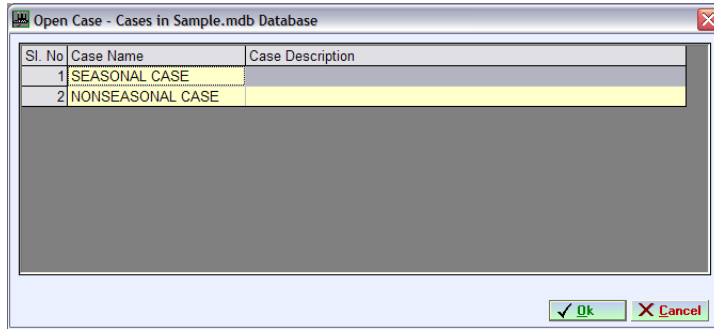


Figure 2-3: Open Case

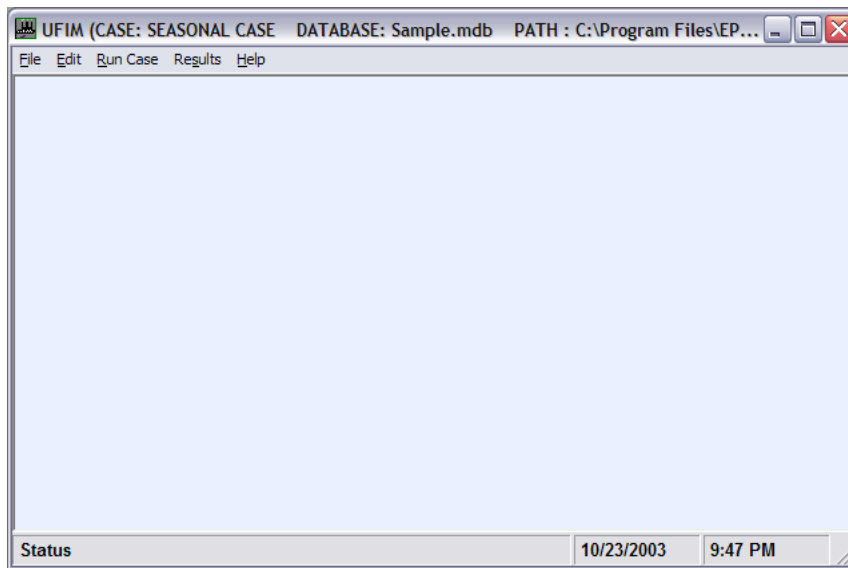


Figure 2-4: Main Screen

2.3 The File Menu

The file menu is used to open new and existing input data sets and to save input data sets. The file menu options are described next. The main screen with the file menu open is shown below in Figure 2-5.

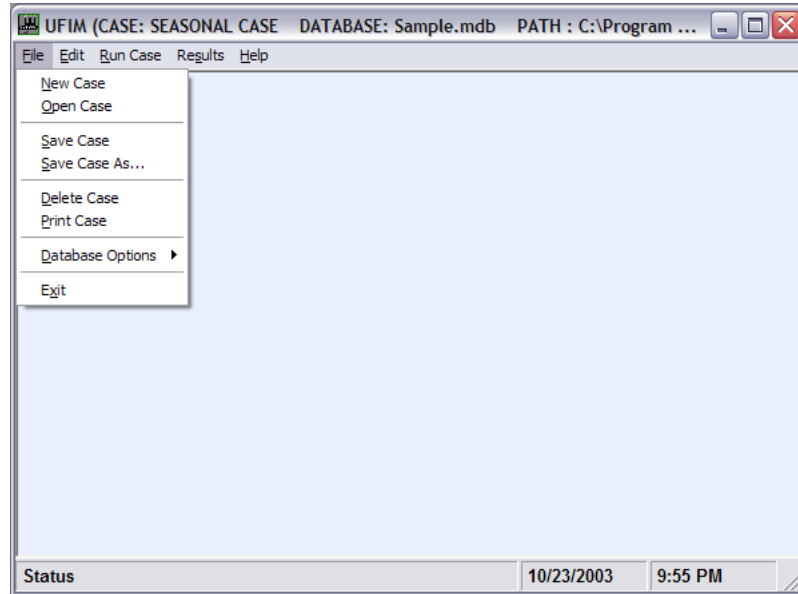


Figure 2-5: Main Screen With File Menu Open

New Case Create and name a new case to adds the case to the database. The case will be added to the current case database.

Open Case: Select a previously-defined case to open. You may select among cases in the current case database.

Save Case: Saves the opened case to the current database.

Save Case As: Save opened case under a different case name in the current case database.

Delete Case: Permanently remove an existing case from the current case database.

Print Case: Displays the input data for the current case, so that you can print or save it to disk.

Database Options: This menu contains options for Creating, Opening, Copying and Deleting a database.

Exit: Leave UFIM and return to the operating system.

2.4 The Edit Menu

The edit menu is used to edit case data, run specifications and advanced user parameters.

2.4.1 Editing Case Data

Figure 2-6 shows the edit menu with the *Edit Case Data* option selected. This option allows you to view or change all of the input data of the current case.

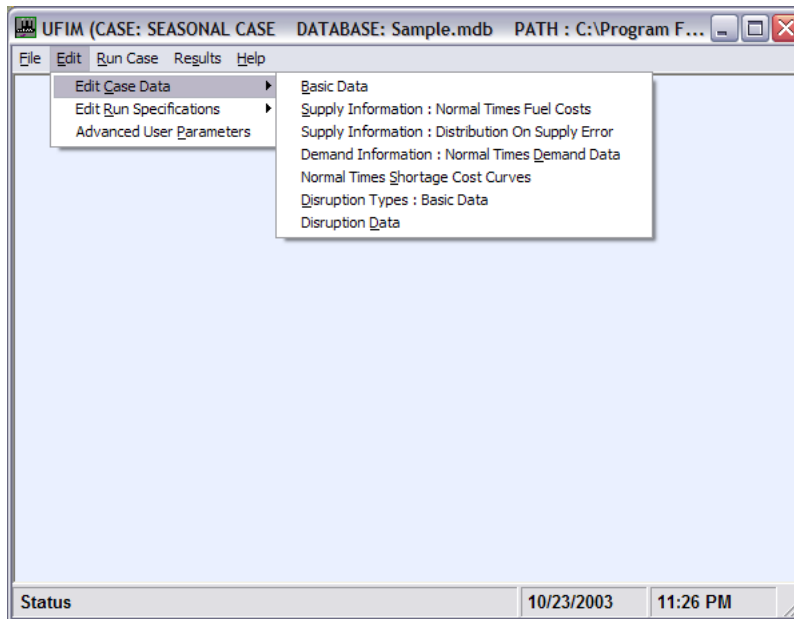


Figure 2-6: Edit Menu - Editing Case Data

NOTE: An extensive context-sensitive help system provides guidance for each data input element (if the user puts the cursor in any data element and presses F1 help is provided). In addition all of the data elements are

explained in detail in the origioanl user manual “UFIM Basic Concepts” included with this software. Because of these two fact the input forms activated by each of the edit menu items are not reproduced here.

Basic Data: Basic Data refers to a general class of information about your utility and how you want to set up the model. It includes initial inventory levels, financial data, and details of the fuel you burn (fuel heat content) and how fast you burn it (plant heat rate). It also includes your choice of options (Seasonality, Period, Run Level, and STEP) that affect the overall structure of your analysis.

Normal-Times Fuel Costs: Supply Information - Normal Times Fuel Costs contains data concerning your utility’s fuel supply line. It includes fuel prices, supply constraints, and a description of any uncertainty in your fuel supply.

Dist. On Supply Error: Supply Information Distribution On Supply Error contains description of any uncertainty in your fuel supply.

Normal-Times Demand Data: Normal-Times Demand Data provides a description of your normal pattern of demand for fuel. Since demand may be uncertain, demand data is entered in the form of probability distributions.

Normal-Times Shortage Costs: If a power plant runs out of fuel, the utility must replace the forgone generation from the plant or curtail service. The total shortage cost incurred is equal to the cost of replacement power, less the cost that would have been incurred had sufficient fuel been available.

A Normal-Times Shortage Cost Curve indicates the marginal cost of replacement power during Normal-Times as a function of the amount of burn reduction (the percent of time that the plant is not run). That is, for each level of burn reduction the curve represents the added cost of reducing plant output by another megawatthour. When calculating shortage costs, UFIM uses the average cost represented by this curve for the cost of replacement power during Normal-Times.

Basic Disruption Data: Disruption Basic Data is the first of two categories of disruption data. It includes disruption frequencies, warnings, and burn reduction options.

Disruption Data: Disruption Data is the second of two categories of data concerning disruptions. It includes durations, fuel prices, demand for fuel, delivery constraints, and replacement power costs for each disruption.

2.4.2 Editing Run Specifications

Figure 2-7 shows the edit menu with the *Edit Run Specifications* option selected. This menu item allows the user to select or change options that determine how UFIM will run the current case.

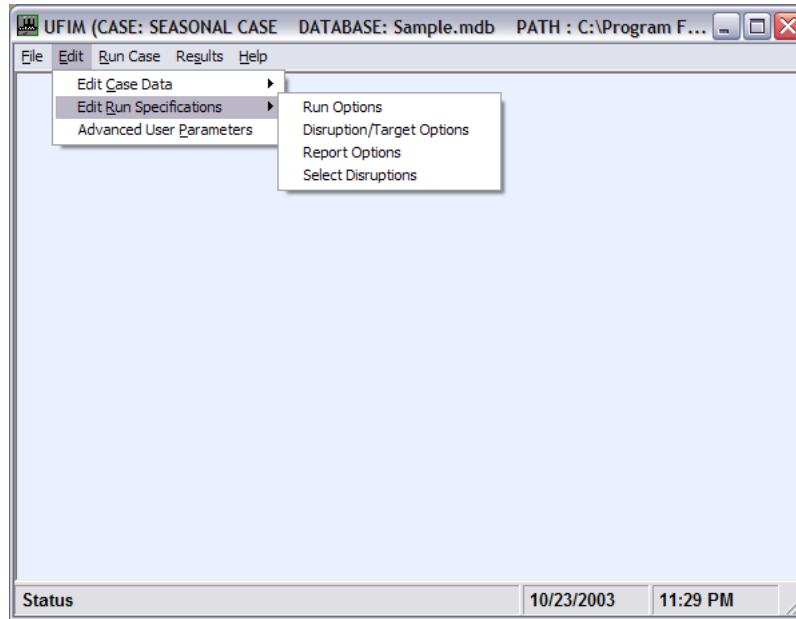


Figure 2-7: Edit Menu - Editing Run Specifications

Run Options These options affect how UFIM operates. In particular, they determine the submodels to be used and the name of the output file.

Disrup./Target Options These options concern the selection of disruption and target data for use in a UFIM run.

Report Options These options concern how UFIM will report output after the run.

Select Disruptions: This item allows the user to select among previously-defined disruptions to include with the run.

2.4.3 Advanced User Parameters

Through this menu item you can access a series of technical parameters that affect UFIM's operation. These parameters give advanced users more

control over how the UFIM model runs. Most users, however, will not need to change them.

2.5 Run Case Menu

This menu contains options for running one or more cases. You can run the current case or run multiple cases. The options in the Run Case menu are shown in Figure 2-8.

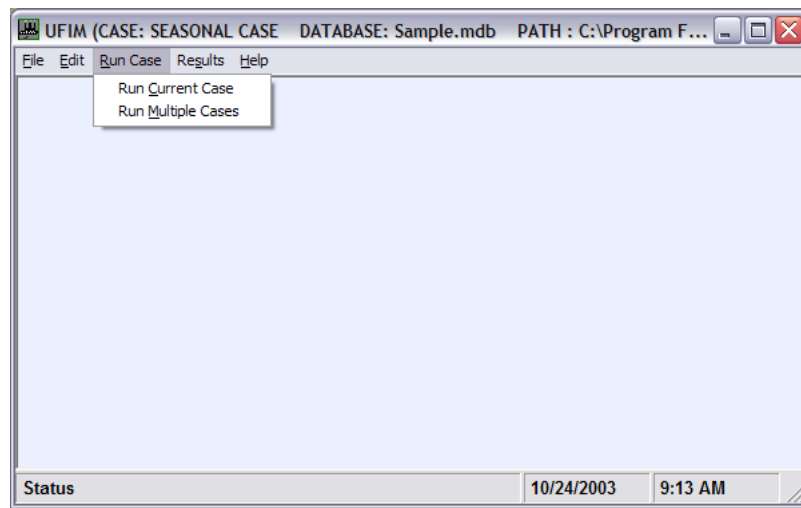


Figure 2-8: Run Case Menu Options

2.5.1 Run Current Case

If the option *Run Current Case* is selected the user is prompted by a dialog box, Figure 2-9, asking if it is *OK* to run the case.

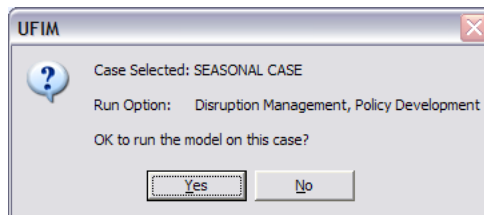


Figure 2-9: Run Case Dialog Box

If yes is selected the model runs and when complete a *Run Log* report is displayed, Figure 2-10.

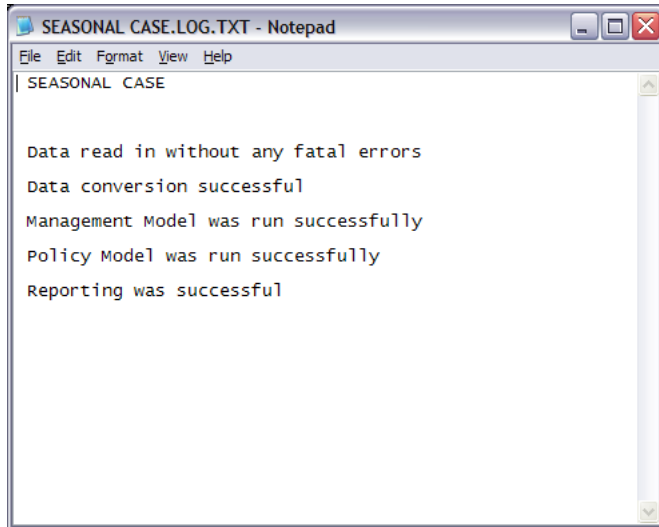


Figure 2-10: Run Log Report

2.5.2 Run Multiple Cases

If the *Edit* menu option *Run Multiple Cases* is selected, one or more previously-defined cases can be run. You may select any set of cases in the current case database. The dialog box for selecting cases is shown by Figure 2-11.

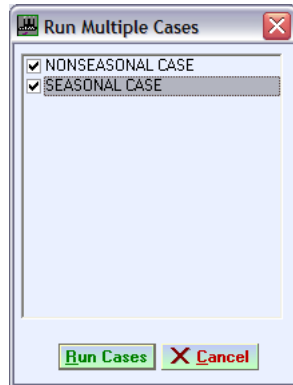


Figure 2-11: Input Form for Selecting Multiple Cases to Run

2.6 Results Menu

This menu contains options to select model outputs for viewing, printing, or exporting to a spreadsheet. Figure 2-12 shows the menu options with the *View Results* option selected.

2.6.1 View Results

If the Seasonal Case is selected a form is show where the user can select one of several output reports, Figure 2-13. The output options are (1) A summary report, (2) a normal-Times report, (3) a disruption report, (4) a report listing the case inputs, (5) the run log, and (6) your own table selection.

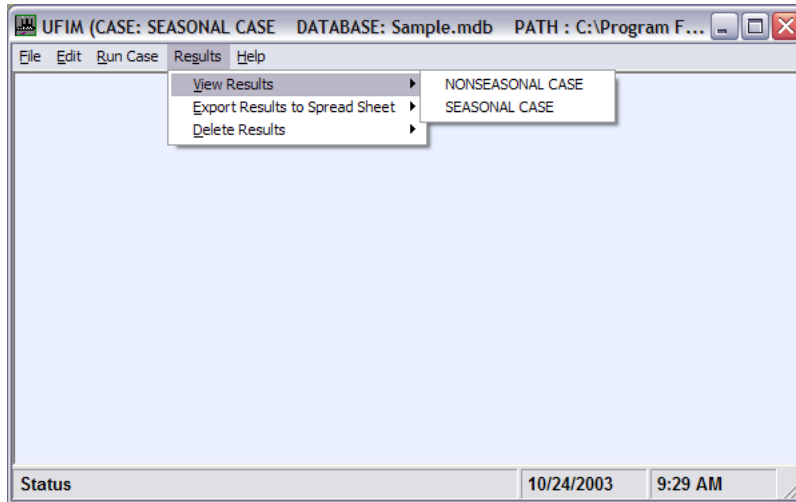


Figure 2-12: Results Menu With The View Results Option Selected

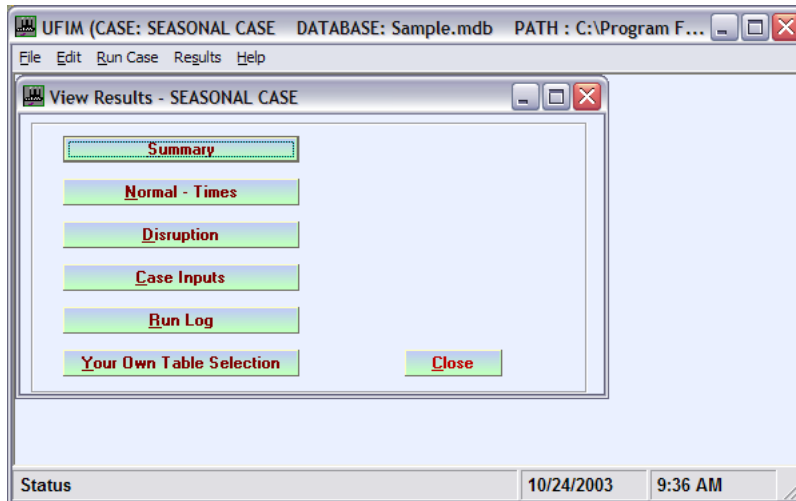


Figure 2-13: View Results Options

2.6.2 Export to Spreadsheet

This menu option allows users to select model outputs to save in spreadsheet-readable format. The file will have the same name as the run from which it was created, with the extension *.CSV* (*Comma Separated Values*).

NOTE: Because the .CSV file will have the same name as the run (for example Seasonal) the user will need to rename the spreadsheet files if they wish to make multiple runs with the same case and export after each run.

2.6.3 Delete Results

This menu option allows users to delete all output files generated by a run. This does not delete the case's original input data.

2.7 Help Menu

The *Help* menu has six items: (1) Introduction to UFIM, (2) Getting Started, (3) Using UFIM, (4) Model Logic, (5) Help Index, and (6) Help on Help, Figure 2-14. This manual and the *Basic Concepts* volume will be added soon.

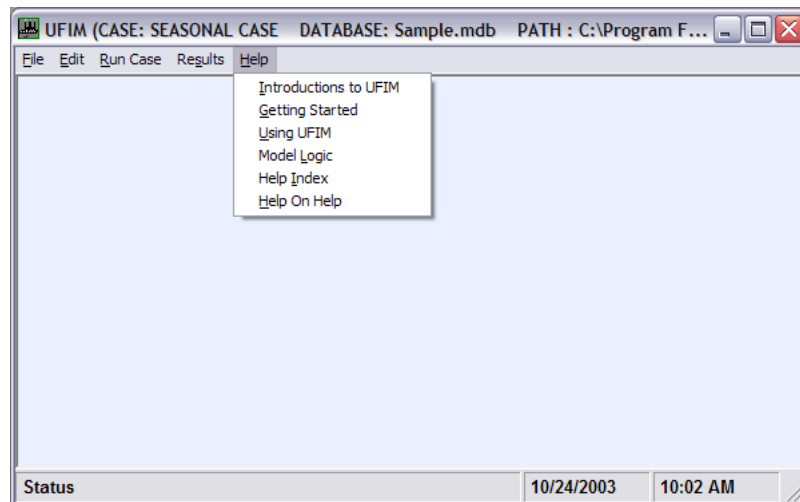


Figure 2-14: Help Menu Options

The *Help on Help* item is worth noting. From any screen you can press *F1* to

get help for that screen. You can also select the help menu from the main menu bar. Each heading in the menu is linked to a series of informational screens, the whole of which covers most topics relating to the model.

On many of the screens, several topics are listed in bold at the bottom of the page. These are additional topics related to the current help topic. To access help on these topics, move the cursor using *TAB* and press *ENTER*. In this way you can reach any topic through the help menu, though you may have to pass through one or two other screens first.