

**DRAFT USER GUIDE
CONSOLIDATED DOCUMENT SYSTEM (CDOCS)
VERSION 1.0**

Prepared for

**Nuclear Regulatory Commission
Contract NRC-02-93-005**

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January 1996

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ABBREVIATIONS

ACRS	Advanced Computer Review System
ADF	Automatic Document Feeder
ASCII	American Standard Code for Information Interchange
CDM	Compliance Determination Method
CDOCS	Consolidated Document Management System
CDS	Compliance Determination Strategy
CNWRA	Center for Nuclear Waste Regulatory Analyses
CPU	Central Processing Unit
DOE	U.S. Department of Energy
DOS	Disk Operating System
DWM	Division of Waste Management
GUI	Graphical User Interface
HLW	High-Level Radioactive Waste
IMS	Information Management Systems
NFS	Network File System
NIST	National Institute of Science and Technology
NRC	Nuclear Regulatory Commission
NUDOCS	Nuclear Document System
NUREG	Nuclear Regulatory Commission Technical Documents
OCR	Optical Character Recognition
QA	Quality Assurance
RIDS	Regulatory Information Distribution System
RPD	Regulatory Program Database
STP	Staff Technical Position
TCP/IP	Transmission Control Protocol/Internet Protocol

ACKNOWLEDGMENTS

This report was prepared to document work performed by the Center for Nuclear Waste Regulatory Analyses (CNWRA) for the Nuclear Regulatory Commission (NRC) under Contract No. NRC-02-93-005. The activities reported here were performed on behalf of the NRC Office of Nuclear Material Safety and Safeguards (NMSS), Division of Waste Management (DWM). The report is an independent product of the CNWRA and does not necessarily reflect the views or regulatory position of the NRC.

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The Technical Reference Document Database System (TDOCS) has been developed in accordance with the software control and documentation requirements of the CNWRA Quality Assurance Manual.

1 INTRODUCTION

1.1 PURPOSE

The Consolidated Document System (CDOCS) is an automated database management system for the Nuclear Regulatory Commission (NRC) Division of Waste Management (DWM) and Center for Nuclear Waste Regulatory Analyses (CNWRA) staffs to use in research and analysis related to radioactive waste regulatory activities. The purpose of this document is to provide a brief system description, procedures, and guidelines for use in operating CDOCS.

1.2 SCOPE AND CONTENT

This *User's Guide* provides guidelines for use in accessing technical references, reports, Quality Assurance (QA) records, correspondence, databases, and other materials used by the NRC and CNWRA staffs. CDOCS contains documents and references in ten databases. The contents of these databases can be searched and retrieved and copied for use in other applications. Additionally, various reports are available. The *User's Guide* gives users access to computer database management tools that can support them in their research and analysis activities. Users are grouped into three broad categories: information users, database custodians, and database administrators. Individual chapters have been devoted to the functions available to these users.

The *User's Guide* consists of this introduction and the following sections:

- *Chapter 2—System Capabilities and Hardware Requirements*—Describes the system design concept and primary functions.
- *Chapter 3—User Guidelines*—Provides information to help users: (i) use the TOPIC search and retrieval software to retrieve, view, and print records; and (ii) view and produce standard reports.
- *Chapter 4—Scanning Guidelines*—Provides general guidance on scanning and optical character recognition (OCR).
- *Chapter 5—Database Custodian Guidelines*—Provides guidance to the database custodians for submitting, updating, and deleting CDOCS records.
- *Chapter 6—Database Administrator Guidelines*—Provides guidance to the database administrator for adding and maintaining user permissions, preferences, and authorities.
- *Chapter 7—References*
- *Appendix A—Password Logon*—provides instruction for: (i) logging on to a password-protected system, and (ii) changing a password.
- *Appendix B—Error Messages*—Provides a listing of error messages and corresponding user actions.

- *Appendix C—ScanWorX Scanning, Optical Character Recognition, and Document Cleanup*—Provides guidance for scanning and performing optical character recognition using the Xerox ScanWorX software and scanner.
- *Appendix D—Calera M/Series Professional Scanning, Optical Character Recognition, and Document Cleanup*—Provides guidance for scanning and performing optical character recognition using the Calera M/Series Professional software.

1.3 BACKGROUND

The DWM has a statutory requirement to make a construction authorization decision within 3 years following the U. S. Department of Energy (DOE) submittal of a license application (LA) for a geologic repository for HLW. This requirement will place considerable demand on the DWM staff as it conducts its LA reviews. The Overall Review Strategy for the Nuclear Regulatory Commission High-Level Waste Repository Program (Johnson, 1993) identifies the following assumptions and strategies that suggest the need for enhanced computer capabilities and tools to support the staff in performing these reviews:

- There will be early availability of preliminary information developed and documented by the DOE during the prelicense application phase.
- The staff will have the ability to use the results of prelicense application reviews and supporting investigations.
- It is possible to streamline the acceptance review process, resulting in compliance reviews that focus less on assessing the completeness of detailed supporting information and methodologies and more on how the detailed information was used to demonstrate compliance.
- The staff will be able to use compliance reviews to verify the acceptability of the DOE compliance demonstration.
- The reviews will be supported through the documentation of concerns as open items and the tracking of these open items.
- The staff will develop and use computer models and codes as an ongoing activity in support of iterative performance assessment.

CDOCS is a part of the Advanced Computer Review System (ACRS), which is being implemented in the DWM to provide technical computing and database and document access capabilities to support the staff in performing technical reviews and analyses. Technical computing requirements addressed by the ACRS include analyzing and displaying spatial and temporal data; constructing and using topology feature models; compiling and running a variety of engineering and scientific codes; and accessing large volumes of data from databases maintained by organizations such as DOE and the United States Geologic Survey. CDOCS functions as part of the ACRS by providing database access, document reference, and database download capabilities; and provides an effective way for staff to access both textual information and images (DeWispelare et al., 1995). Textual information is fully accessible through

the search and retrieval capabilities. Image information associated with textual documents, including maps, charts, graphs, photographs, and other image data, is also directly accessible through CDOCS.

Over a period of years, a number of diverse databases, systems, and information access capabilities have been developed which partially satisfy the information requirements of the staff. The Nuclear Document System (NUDOCS) at the NRC has been used for loading, searching, and retrieving a large volume of bibliographic references and the full text of selected HLW documents. The Technical Document Index (TDI) system at the CNWRA has been used for storage and retrieval of bibliographic records for Regulatory Information Distribution System (RIDS) documents, technical reports produced by the CNWRA, and associated reference documents. A database containing over 1,000 bibliographic references and approximately 110 document reviews related to container materials was developed at the National Institute of Science and Technology (NIST); this database is currently maintained at the DWM. Another database containing bibliographic references related to hydrologic transport was developed at Oak Ridge National Laboratory; this database is also currently maintained at the DWM. Other bibliographic databases pertaining to site characterization, technical reviews, and research are maintained at the DWM, the CNWRA, and elsewhere. The DWM Regulatory Program Database (RPD) provided access to License Application Review Plan (LARP) products such as Compliance Determination Strategies (CDSs) and Compliance Determination Methods (CDMs) as well as the open items associated with the HLW regulatory program (DeWispelare et al., 1995). CDOCS and RPD have been combined into a single text management system, CDOCS.

Each of these diverse systems and databases has been developed with its own user interface and access protocols. The resulting environment provided only limited support for the staff in addressing their information needs. The role of CDOCS within the ACRS is to provide a unified and consistent facility, capable of interfacing with office automation systems, for staff to use in accessing textual information and associated images.

2 SYSTEM CAPABILITIES AND HARDWARE REQUIREMENTS

2.1 SYSTEM CAPABILITIES

The design philosophy for CDOCS includes satisfying a number of requirements.

- Enhance usability of the system through graphical user interfaces (GUIs). Support for analysis and review of documents required the implementation of standard GUIs so that multiple documents may be viewed concurrently and so that font and window sizes which are appropriate to the displayed documents may be selected by the user.
- Provide full functionality in CDOCS across multiple computer platforms while maintaining the native appearance and operation of those platforms.
- Use commercially available software to the greatest extent possible. Search and retrieval capabilities are implemented using the Verity product TOPIC. The structured query language (SQL)-compliant product ORACLE provides the relational database used in CDOCS. The GUI development toolkit, Galaxy by Visix, is used to support development of custom client code for all computer platforms.
- Comply with standards [open system, SQL, and standard generalized markup language (SGML)] to ensure current and future compatibility. Conform to (i) the POSIX standard for open systems; (ii) SQL standards for databasing to support a wide diversity of present and anticipated hardware and software configurations, and ensure compatibility with current and future SQL database syntax; and (iv) the SGML standard for formatting and processing text which provides the flexibility required for viewing and manipulating portions of documents to produce custom documents efficiently.
- Provide a generalized report writer capability for extracting and integrating database information into new documents.

Information in CDOCS is organized into document sets to (i) facilitate efficient access to specific types of documents and to documents containing related information, and (ii) control access to certain document sets based on the type of user (e.g., DWM users versus CNWRA users). For many of the document sets, CDOCS contains full text files, and record searches are performed on the full text. Other document sets include only bibliographic header information (i.e., title, author, etc.), and searches for documents within those sets are limited to the header information.

CDOCS database custodians and database administrators are able to add, update, and delete records while other users are limited to accessing, copying, and editing records (for incorporation into other products), and generating reports. The capabilities to search for and display records and incorporate those records into other work products are available to all users. Standard reporting functions are available to all users, but access to some specific reports is limited to the database administrator. The CDOCS user interface has been adapted to accommodate the specific capabilities and permissions available to the user so that only the authorized functions, document sets, and reports are presented.

2.2 CONSOLIDATED DOCUMENT SYSTEM DOCUMENT SETS

Following are the document sets contained in CDOCS.

- NRC Technical Documents database—Full-text technical documents submitted and maintained by DWM.
- NRC Technical Documents Bibliography database—Bibliographic headers of technical documents submitted and maintained by the DWM.
- National Institute of Science and Technology Materials database—Bibliographic headers for approximately 1,000 references; also contains 110 reviews of DOE documents associated with 20 data fields that permit access to the contents of pertinent technical information and reviewer comments, submitted and maintained by DWM.
- Hydrology database—Bibliographic headers for references with cross references to reviews, maintained by DWM.
- CNWRA Technical Document Index—An index of bibliographic headers of technical documents archived at the CNWRA.
- CNWRA Technical Documents—A collection of full-text technical documents submitted by the CNWRA.
- Correspondence Index—An index of bibliographic headers for correspondence.
- CNWRA Quality Assurance Index—An index of bibliographic headers for QA documents maintained in the CNWRA QA records storage facility.
- Correspondence—Full-text correspondence.
- Regulations—A collection of selected statutes and regulations in full text.
- NUREGS—A collection of selected NUREG documents in full text.
- Staff Technical Positions—A collection of selected NRC Staff Technical Positions (STPs) in full text.
- CNWRA Reports—Full-text deliverable reports produced by the CNWRA.
- Review Plan Citations and Supplements (RPS)—Full text applicable regulatory requirements and supplementary information for the LARP.
- Compliance Determination Methods—Full text.
- Compliance Determination Strategies—Full text.
- Open Item Records—Full-text regulatory products.

2.3 PRIMARY FUNCTIONS

2.3.1 Records Search and Retrieval

CDOCS provides powerful and easy-to-use facilities for identifying and viewing records. The TOPIC search and retrieval software is used to find CDOCS records by searching for specific words or phrases in : (i) the text of the documents, and/or (ii) document header fields.

2.3.2 Records Display and Print

After being selected, a full-text record can be displayed and viewed on the screen and may also be printed or saved to an electronic file.

2.3.3 Cut and Paste Facilities

Full-text records may be cut and pasted, which permits copying the relevant text in documents. The text may be saved, incorporated into other documents, or printed.

2.3.4 Reports View and Print

CDOCS reports include: (i) database content and statistics reports, and (ii) reports composed of certain types of CDOCS records. Additional customized reports may be developed on request.

2.4 MULTIPLATFORM IMPLEMENTATION OF THE CONSOLIDATED DOCUMENT SYSTEM

CDOCS has been implemented in a multiplatform environment allowing use in diverse hardware/software environments. Therefore, while CDOCS functions the same in all supported hardware/software environments, the appearance and operation of the system vary slightly. CDOCS runs on any of three different hardware/software environments:

- Microsoft Windows using IBM PS/2 or compatible hardware
- OPEN LOOK or MOTIF using Sun hardware
- IBM OS/2 using IBM PS/2 or compatible hardware
- Mackintosh using System 7 operating system

The following sections describe the minimum requirements necessary to achieve acceptable system functionality and performance for each hardware and software environment. Instructions for installing CDOCS on each of the platforms are provided in Appendix A.

2.4.1 Minimum Sun Workstation Requirements

- Sun 4 Architecture (IPX or faster)
- 32 MB random access memory (RAM)

- 10 MB free hard disk space
- Sun OS 4.1.3 or Solaris 2.3

2.4.2 Minimum Windows Workstation

- Intel 80486 central processing unit (CPU)-based computer
- 8 MB RAM
- 10 MB free hard disk space
- Microsoft Windows Version 3.1 or later
- File Transfer Protocol (FTP) Version 3.0 (also known as On-Net) by FTP Software

2.4.3 Minimum OS/2 Workstation Requirements

- Intel 80486 CPU-based computer
- 16 MB RAM
- 10 MB free hard disk space
- IBM OS/2 Version 2.1 or later
- IBM Transmission Control Protocol/Internet Protocol (TCP/IP) Version 2.0 or later, configured for Network File System (NFS)

2.4.4 Minimum Macintosh Workstation Requirements

- Power Macintosh
- 32 MB RAM
- 10 MB free hard disk space
- System 7, or later

2.4.5 Scanning Workstations

2.4.5.1 Sun Scanning Workstation

- ScanWorX scanning software by Xerox
- Minimum Sun Workstation as described in Section 2.4.1
- Quarter inch QIC-24 or QIC-150 tape drive (for installing the ScanWorX software on the Sun Workstation)

- ScanWorX scanner

2.4.5.2 Windows Scanning Workstation

- M/Series Professional scanning software by Calera Recognition Systems
- DOS 5.0 or later
- Minimum Windows Workstation as described in Section 2.4.2
- Scanners:
 - Fujitsu 3096G, 3093E/3096E+, and Scan Partner
 - Hewlett Packard ScanJet Plus, IIc, and IIp with an Automatic Document Feeder (ADF)

3 USER GUIDELINES

The previous chapters provided a general introduction to CDOCS and its primary functions. This chapter provides the basic information needed to use CDOCS.

CDOCS has been designed to support users with various levels of computer experience. Mistakes made at the workstation will not damage CDOCS or introduce errors into the data in CDOCS. For security reasons, access to CDOCS is restricted to NRC and CNWRA staff members with appropriate User IDs. Help is available from system menus, from the CNWRA Help Desk at (210) 522-5258, or from the NRC System Administrator at (301) 415-8087.

3.1 TYPOGRAPHIC CONVENTIONS

Throughout the *User's Guide*, the following typographic conventions are used:

- Screen menu names, menu items, and push-button names appear in italics with initial caps or as they appear on the screen

Example: Select *CDOCS* from the menu bar of the *CDOCS Main Menu*.

- User input and system prompts appear in bold Courier typeface

Example: Enter the path and file name: **c:\wp51\wp.exe**

- Keystroke input from the keyboard appears as initial caps inside square brackets

Example: Press [F1], then [Return]

- Keystroke input from the keyboard using combinations of keys (e.g., hold down the Ctrl key and press H) appears as initial caps, with the combination of keys joined by a plus sign, inside square brackets

Example: Press [Ctrl+H]

3.2 DEFINITIONS

Following are some basic definitions for use with graphical user interfaces (GUIs). Further information about the standard GUIs for Microsoft Windows, MOTIF, and OS/2 may be found in *Using Windows* (Que Corporation, 1994), *OSF/MOTIF Style Guide* (Open Software Foundation, Inc., 1993), and the *Object-Oriented Interface Design IBM Common User AccessTM Guidelines* (IBM Corporation, 1992).

Accelerator keys An alternate method of selecting menu items that is similar to mnemonics. However, unlike mnemonics, the accelerator keys may be used even when the pull-down menu is not displayed. For example, the accelerator key, [Ctrl+H] or [^H] (hold down the Ctrl key and press the "H" key) may be used from any main

menu to start the CDOCS help facility. The appropriate accelerator keys are displayed at the right of each menu entry.

- Click* Objects in GUI applications are normally selected by using the mouse to position the cursor over the object and then pressing one of the mouse buttons. When the mouse button is depressed it makes a clicking sound. Thus, selection process is often described as “clicking” on the object.
- Drag* Many objects in a GUI presentation may be moved around on the screen. This is done by positioning the cursor over the desired object, depressing and holding the left mouse button, moving the cursor to the new location, and releasing the mouse button. As the cursor is moved with the mouse button depressed, the selected object follows the cursor movements. Thus, the object is “dragged” to the new location.
- GUI* A GUI is a presentation of information on a computer screen that takes advantage of high-resolution graphics and usually employs a mouse, menu bars, and other types of menus, overlapping windows, and icons.
- Mnemonics* Alphabetic characters, indicated by an underscore that may be keyed to select the desired options rather than using the mouse. For example, the option in the *Operations* pull-down menu that permits the user to exit the CDOCS is represented by the menu entry “*Exit*.” Either select this entry with the mouse or key the mnemonic, “x.”
- Mouse* A commonly used pointing device that has one or more buttons. When the mouse is moved, the cursor moves in a corresponding manner on the screen. When one of the mouse buttons is pressed, a signal is sent to the program that results in some interaction with the system.
- Mouse button* A button on a mouse that sends a signal to the system when pressed. Mouse buttons are used to select choices, initiate actions, or manipulate objects on the screen.
- Select* Position the cursor on top of the item to be selected (e.g., menu name, button, icon, etc.) and press (or click) the left mouse button.

3.3 GRAPHICAL USER INTERFACE CONTROLS AND FEATURES

- Cascading menu* An area to the left or right of an entry in a pull-down menu that expands the options or functions available for that entry. Cascading menus provide a way to layer choices so that a user can have access to a wide range of functions without being confused by lengthy lists of choices. Selecting an entry in a cascading menu causes the related system function(s) to be performed.

<i>Cursor</i>	A visual cue that indicates where the next interaction with the computer screen will take place. Cursors are moved by the mouse or the cursor keys and provide a way to select and interact with things that appear on the screen.
<i>Drop-down list</i>	A variation of the list view in which only one item in the list is displayed until an action is taken to display the rest of the list. Drop-down lists are used in situations where a list view is needed but would crowd the window if always present.
<i>Entry field</i>	A location in a screen where entry or alteration of textual or numeric information, such as a file name, password, or version number, is allowed. Entry fields may accommodate single words or numbers, or single or multiple lines of text.
<i>Group box</i>	An area in a screen that contains related information and controls. Group boxes are usually surrounded by a labeled square or rectangular line.
<i>Help screen</i>	A screen that contains information about how to use the system, recover from problems, select available choices, etc. Help screens can be used for assistance while learning to use the system. They can also serve as a refresher for users who have not accessed the system regularly or recently.
<i>Icon</i>	A small image that represents a function or data object.
<i>List view</i>	A read-only field with one or more scroll bars that contains multiple entries. The list view is used to display a fixed or variable list of values, fields, or options (e.g., the list of all documents). Because the display area in a list view can be scrolled, the list can contain more items than can be displayed at one time in the display area.
<i>Maximize button</i>	A control in the upper right-hand corner of the window that expands the window to its maximum size.
<i>Menu</i>	A presentation of options.
<i>Menu bar</i>	An area extending across the top of a window below the window title that lists the menu entries. Selecting these menu entries causes either the related system functions to be performed or a pull-down menu with additional entries and options to be displayed. The existence of a pull-down menu is usually indicated by a small downward-pointing arrow or triangle at the right-hand side of an entry in the menu bar.
<i>Messages</i>	Information displayed when there is a particularly important or urgent condition in the software in use. Messages often contain not only a description of a problem but also an explanation of how to correct the situation. They may also contain selections that assist in deciding how to continue working.
<i>Minimize button</i>	A control in the upper right corner of the window that shrinks the window to an icon.

<i>Pane</i>	A defined area within a window that is used as a separately scrollable area. Windows are sometimes divided into two or more panes so that different but related information may be displayed and scrolled independently.
<i>Pull-down menu</i>	A list of options extending below an entry in a menu bar that is displayed when a menu bar entry is selected. Pull-down menus contain choices and functions that are related to each other in some manner. Typically they contain additional menu entries and/or options related to the "parent" entry on the menu bar. Selecting an entry in a pull-down menu causes either the related system functions to be performed or a cascading menu with additional entries and options to be displayed.
<i>Push-button</i>	A labeled, rectangular or oval "button" that causes an action to be taken when it is selected. When a push-button is selected (e.g., by pressing the left mouse button when the cursor is over the push-button), it is shaded and appears to be depressed. The push-button remains shaded until the action is completed and then returns to a "normal," deselected appearance.
<i>Radio buttons</i>	Two or more related button controls that permit selection of mutually exclusive options. The selected option is shaded and appears to be depressed. When a different option is selected, the radio button for that option is shaded and depressed, and the previously selected radio button returns to a "normal," deselected appearance.
<i>Sash line</i>	A bold line separating two panes within a window.
<i>Scroll bar</i>	A control, usually positioned at the right-hand side or bottom of a window, that permits the contents of the window to be moved horizontally or vertically within the window.
<i>Sizing buttons</i>	Controls in the corners of the window that can be used to change the size and shape of the window.
<i>Title bar</i>	An area at the top of the window containing a brief title of the window. Pressing the left mouse button when the cursor is in the title bar and "dragging" it moves the window to a new position on the screen.
<i>Window</i>	An area on the screen where data, icons, controls, etc. can be viewed. A window is bounded by a window border that separates the window from other windows on the screen. The window size and its contents may be changed and controlled by using a number of controls in the window border.

CDOCS has been implemented in a multiplatform environment allowing it to be accessed by users in diverse hardware/software environments. While CDOCS functions in the same way in all of the supported hardware/software environments, the appearance and function of the system will vary slightly. The Windows environment has been selected for the screens presented in this *User's Guide*. Sample

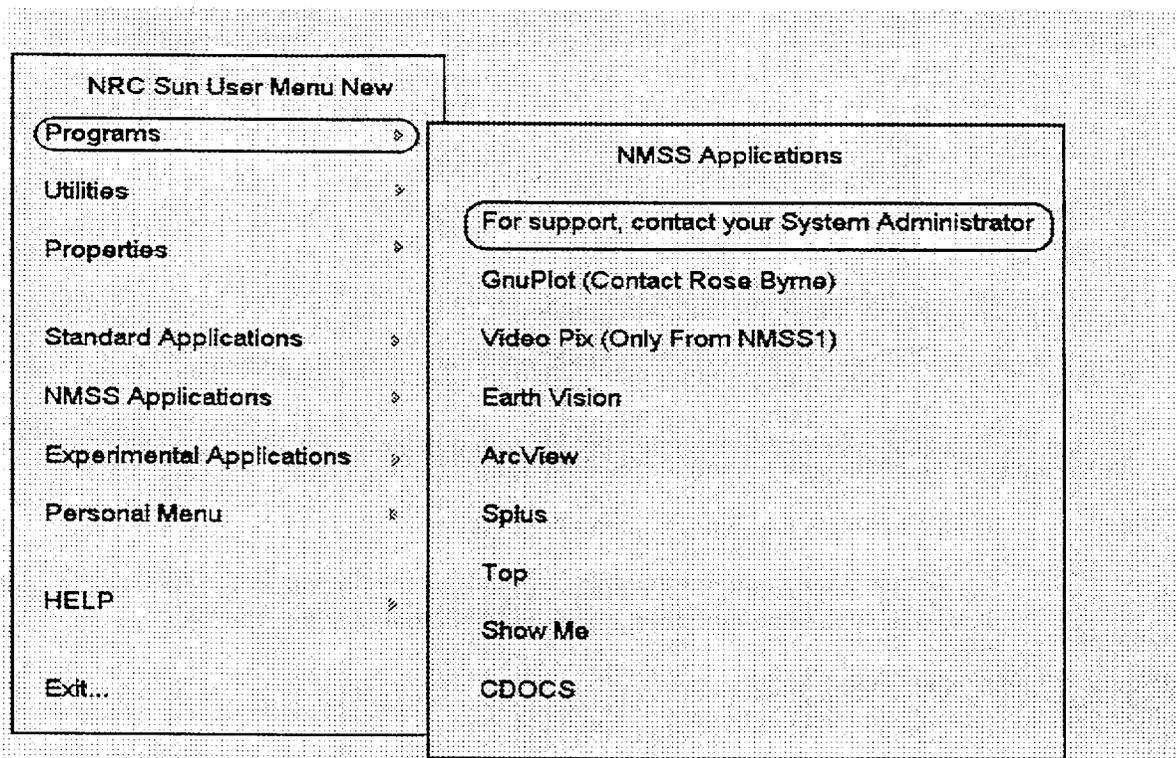


Figure 3-1. Sample screen for a UNIX workstation

screens for a UNIX workstation (Figure 3-1) and for disk operating system (DOS) Windows (Figure 3-2) are provided.

All of the hardware/software environments employ a mouse to permit the user to quickly select options and traverse menus. Communication with the system is accomplished by positioning the cursor, using the mouse, and pressing the left button (except when the specific hardware/software environment requires use of the right button) to select the desired option. Most menu entries also include mnemonics and accelerator keys.

3.4 SOURCES OF ASSISTANCE

There are a number of sources that can provide assistance to the user:

- **Help Screens**—Help that can be activated by positioning the cursor and selecting the *HELP* button or menu entry is provided for each screen display.

Training—Training for all NRC and CNWRA staff will be provided. Additionally, periodic training for new staff and retraining for any other staff will be provided on request.

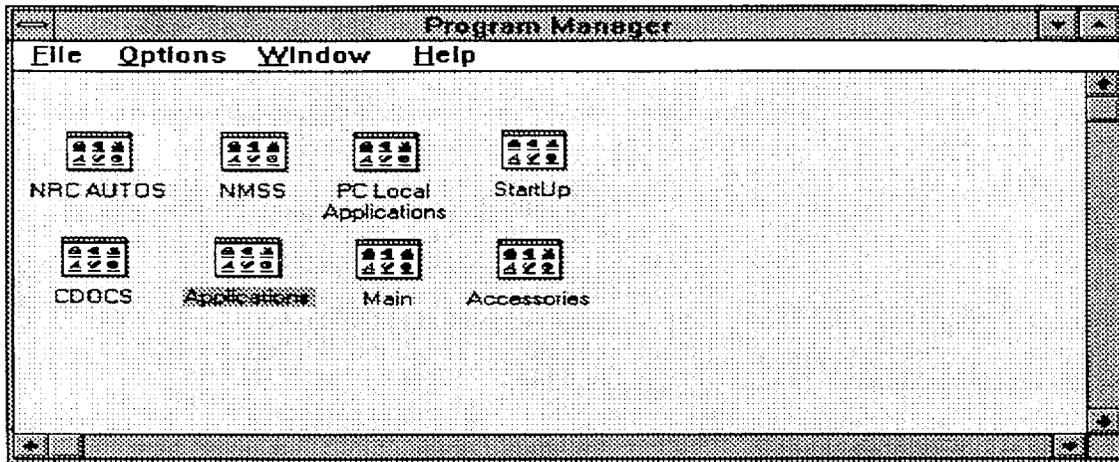


Figure 3-2. Sample screen for DOS Windows workstation

- Assistance—Telephone assistance is available by calling the CNWRA Help Desk at (210) 522-5258, or the NRC System Administrator at (301) 415-8087.

3.5 GETTING STARTED

To get started, a proper workstation with CDOCS software installed (as described in Section 2.4) is required. The program is executed by clicking on the CDOCS icon and executing the correct logon procedures. While using CDOCS, various system status and error messages may be displayed to alert the user to conditions detected by the program. Many of these messages appear in their own windows, and must be cleared before continuing by selecting a push-button at the bottom of the message window. The wording of the messages, their meaning, and appropriate responses are described in Appendix B.

CDOCS is normally started by selecting it on the screen display.

1. On a Windows workstation, double click on the *CDOCS* icon on the Windows desktop, the *CDOCS application* icon appears (Figure 3-3). Double click on the *CDOCS application* icon.

On a Sun workstation, position the cursor on the desktop area of the screen and press the right mouse button (for MOTIF environment). A pull-down menu of functions appears.

On an OS/2 workstation, double click on the CDOCS icon on the OS/2 desktop.

2. Select *CDOCS*. The system starts CDOCS, and displays the *CDOCS Logon* screen, if required. Refer to Appendix A for logon instructions.

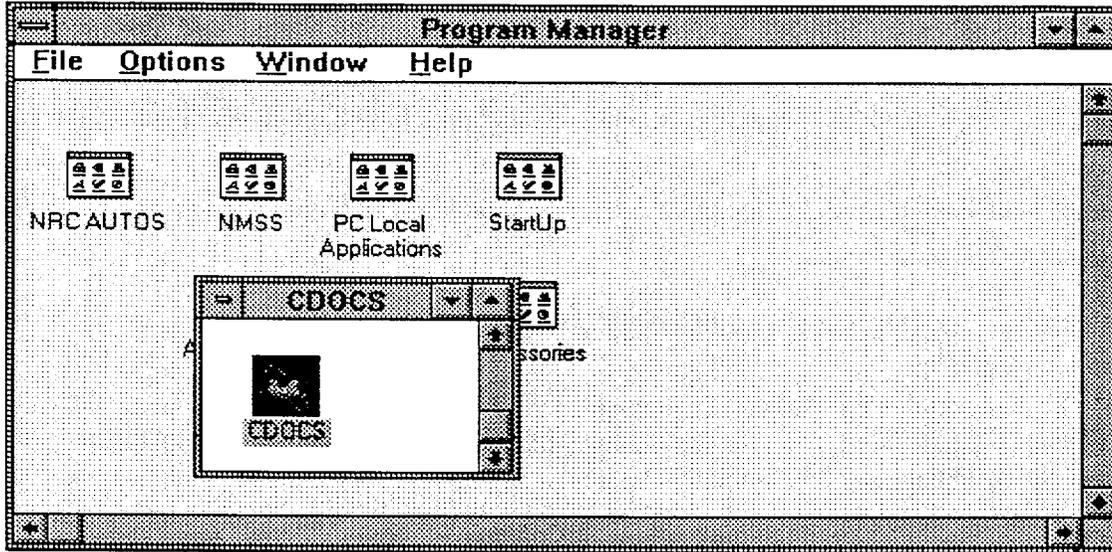


Figure 3-3. Sample screen for Windows application icon

3.6 CONSOLIDATED DOCUMENT SYSTEM MAIN MENU

After CDOCS has been successfully started, the *CDOCS Main Menu* screen is displayed (Figure 3-4). The menu bar in this screen contains the major functions that the user is permitted to perform. Users with special permissions have additional entries available in the menu bar (see Section 5.2 and Section 6.2). For all users, the following entries appear in the menu bar of the *CDOCS Main Menu*:

Operations—Copy a regulatory program or OITS record, use WordPerfect to edit a regulatory program or OITS record, change passwords (for CNWRA users), or exit from CDOCS

Search—Use information searches to find and access CDOCS records

Report—Access CDOCS report facilities to display and/or print standard reports

Help—Access CDOCS help facilities to get more information about how to use CDOCS

Functions may be selected by positioning the cursor on the menu bar of the *CDOCS Main Menu* and selecting the desired entry. Depending on the function selected, either a pull-down menu is displayed or the function selected is automatically executed.

Mnemonics, where applicable, are available to facilitate selection of entries from the menus. Mnemonics are alphabetic characters, indicated by an underscore, that may be keyed to select the desired options rather than using the mouse. Accelerator keys (e.g., [Ctrl+H] or [^H]) are also available, and provide an alternate method of selecting functions from the pull-down menus under the main menu entries.

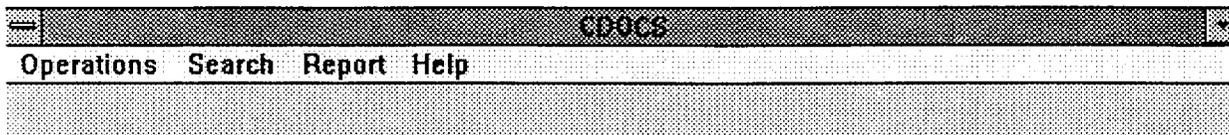


Figure 3-4. CDOCS main menu

3.7 MAIN MENU—OPERATIONS ENTRY

The *Operations* main menu entry permits performing general functions that are available to all users. Selecting *Operations* from the menu bar of the *CDOCS Main Menu* causes the *Operations* pull-down menu (Figure 3-5) to appear. This pull-down menu contains functions for: (i) copying a regulatory program or OITS record, (ii) using WordPerfect to edit a regulatory program or OITS record, or (iii) exiting CDOCS. CNWRA users also have the option to change passwords for their logging-in procedure. The database custodians have additional entries in the *Operations* pull-down menu to support their requirements (see Section 5.3 and Section 6.3). Scan capable workstations also have an additional entry to allow access to the scanning software.

3.7.1 Operations—Copying Regulatory Program and Open Item Records

The *Copy* entry in the *Operations* pull-down menu may be used to make electronic copies of information in the database by copying the record to diskettes or the local hard disk. The general process for copying a regulatory program or OITS record is to: (i) select the record to be copied from a list of available records, and (ii) indicate the name of the destination file where the system will copy the information. If you are copying a regulatory program or OITS record to a new destination file, you must enter the full path and file name in the *Filename for Copy* entry field. If you are copying the regulatory program or OITS record to an existing destination file, you may use the *File Chooser* facility to obtain the full path and file name of the existing destination file.

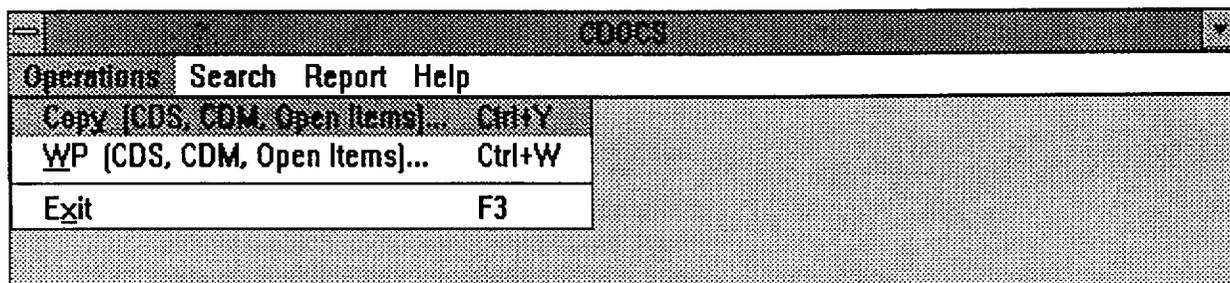


Figure 3-5. CDOCS—Operations pull-down menu

To copy a regulatory program or OITS record:

1. Select the *Operations* entry from the menu bar in the *CDOCS Main Menu* (Figure 3-4). The system will display a pull-down menu (Figure 3-5) that contains options to: (i) copy regulatory program or OITS records, (ii) use WordPerfect to edit regulatory program or OITS records, (iii) change passwords (CNWRA users only), or (iv) exit CDOCS.
2. Select *Copy* from the *Operations* pull-down menu. Alternatively, you may type the mnemonic [y] or the accelerator key [^y]. The *Copy a Regulatory Program Record* screen (Figure 3-6) will be displayed.
3. Select the *Document Type* pull-down list indicator to display the pull-down list of document types.
4. Select the desired document type from the *Document Type* pull-down list. Relevant information for the selected document type will appear in the list view. Note that the information in this list view may be scrolled horizontally and vertically.
5. Position the cursor in the list view and select the line that contains the desired record by clicking on it with the left mouse button.
6. If you are copying the record to a new file, you must enter the full path and file name in the *Filename for Copy* entry field.

If you are copying the record to an existing file, you may enter the full path and file name of the existing file, if known, in the *Filename for Copy* entry field. If you are not sure of the full path and file name of the existing file, you may let the CDOCS file management system assist you by selecting the *File Chooser* push-button next to the *Filename for Copy* entry field. This will cause a list of files in the current directory to be displayed on the *File Chooser* input screen (Figure 3-7), and you may position your cursor on the filename and select the desired file. If the desired file is in a different directory than the one being displayed by the file chooser, you may position your cursor and select a different directory. This will cause the names of the files in the new directory to be displayed so that you can select the desired file.

When you have selected the desired file name you may click on the *OK* push-button on the *File Chooser* screen. This will cause the path and file name of the selected file to be copied to the *Filename for Copy* entry field, and the previous screen will be displayed. The currently selected path and file name will automatically be passed back to the previous screen.

To exit the *File Chooser* screen, select the *Cancel* push-button. If you select the *Cancel* push-button to exit before selecting the *Apply* or *OK* push-button, any file names that you have selected will be discarded, and the original file name in the *Filename for Copy* entry field will not be changed.

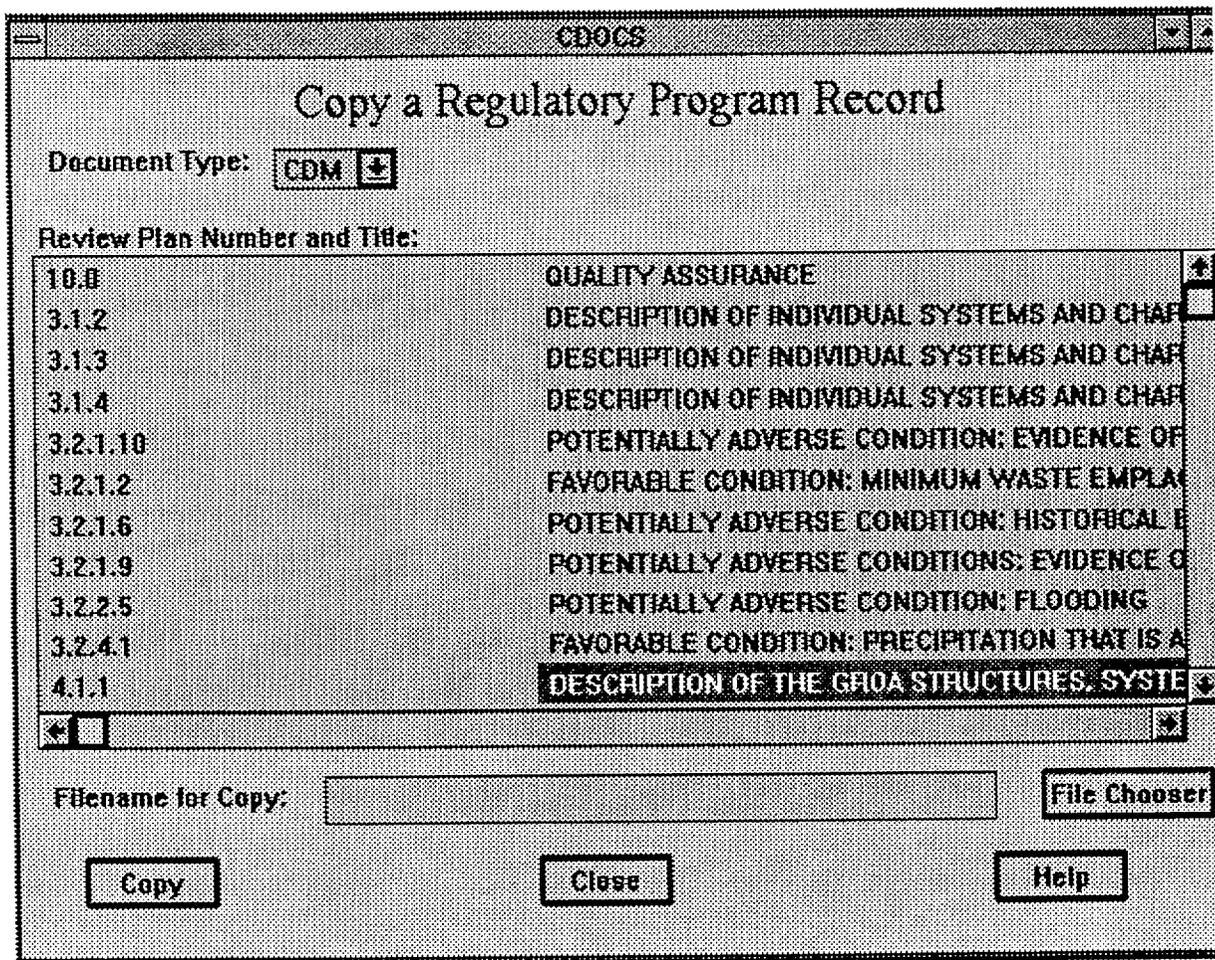


Figure 3-6. Copy a Regulatory Program Record

7. Visually review the record you have selected and the file name and path that you have entered, and make changes if necessary. When all of the information is correct, select the *Copy* push-button at the bottom of the screen. The record will be copied to the specified destination file.
8. To exit, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Copy* push-button, any information that you have entered will be discarded, and the record will not be copied to the destination file.
9. If you need assistance in using the copy function, select the *Help* push-button at the bottom of the screen to display additional information.

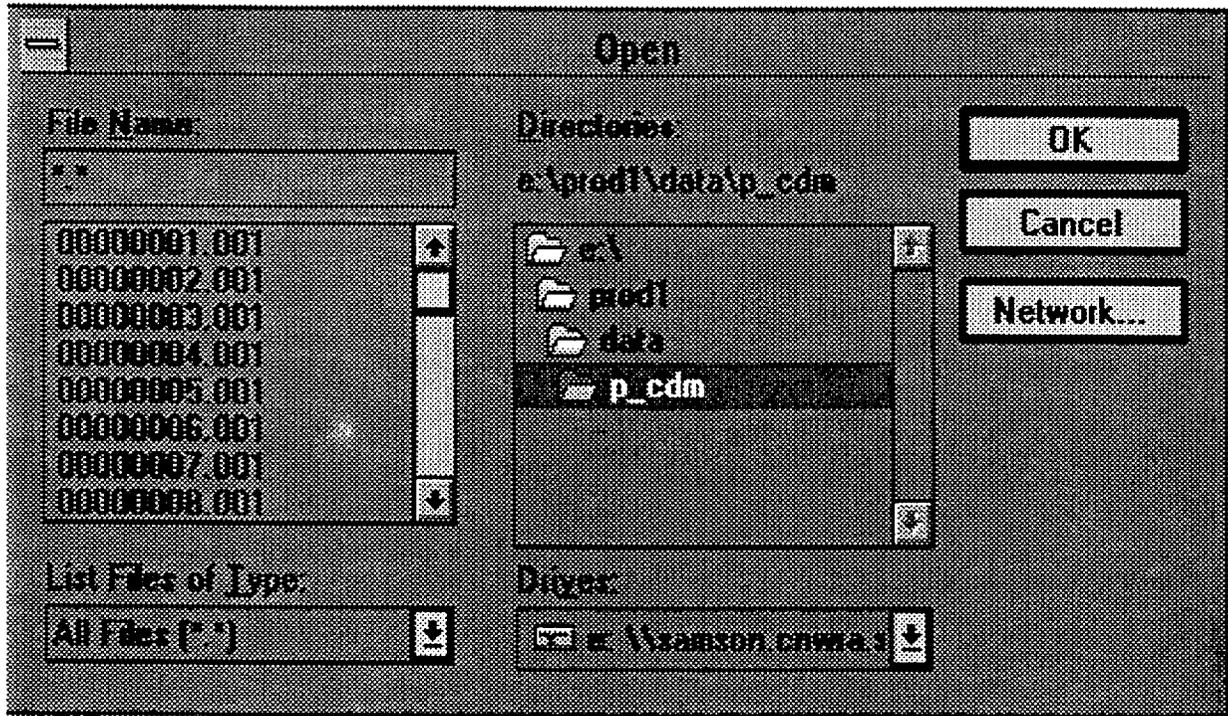


Figure 3-7. File chooser input screen

3.7.2 Operations—Editing Regulatory Program and Open Item Records with WordPerfect

You may use the *WordPerfect* entry in the *Operations* pull-down menu (Figure 3-5) to access copies of information in the database using WordPerfect. The general process for editing a regulatory program or OITS record using WordPerfect is to: (i) select the record to be edited from a list of available records, and (ii) start the WordPerfect software so that the selected record can be edited. The records edited through WordPerfect may not be stored directly in CDOCS, but can be saved on a diskette or on the local hard disk.

To edit a Regulatory Program or OITS record using WordPerfect:

1. Select *Operations* from the menu bar of the *CDOCS Main Menu* (Figure 3-4). The system will display a pull-down menu (Figure 3-5) that contains options for (i) copying regulatory program or OITS records, (ii) editing regulatory program or OITS records using WordPerfect, (iii) changing your password, or (iv) exiting the CDOCS.
2. Select *WordPerfect* in the *Operations* pull-down menu. Alternatively, you may type the mnemonic [w] or the accelerator key [^w]. The *Edit a Regulatory Program Record Using WordPerfect* screen (Figure 3-8) will appear.

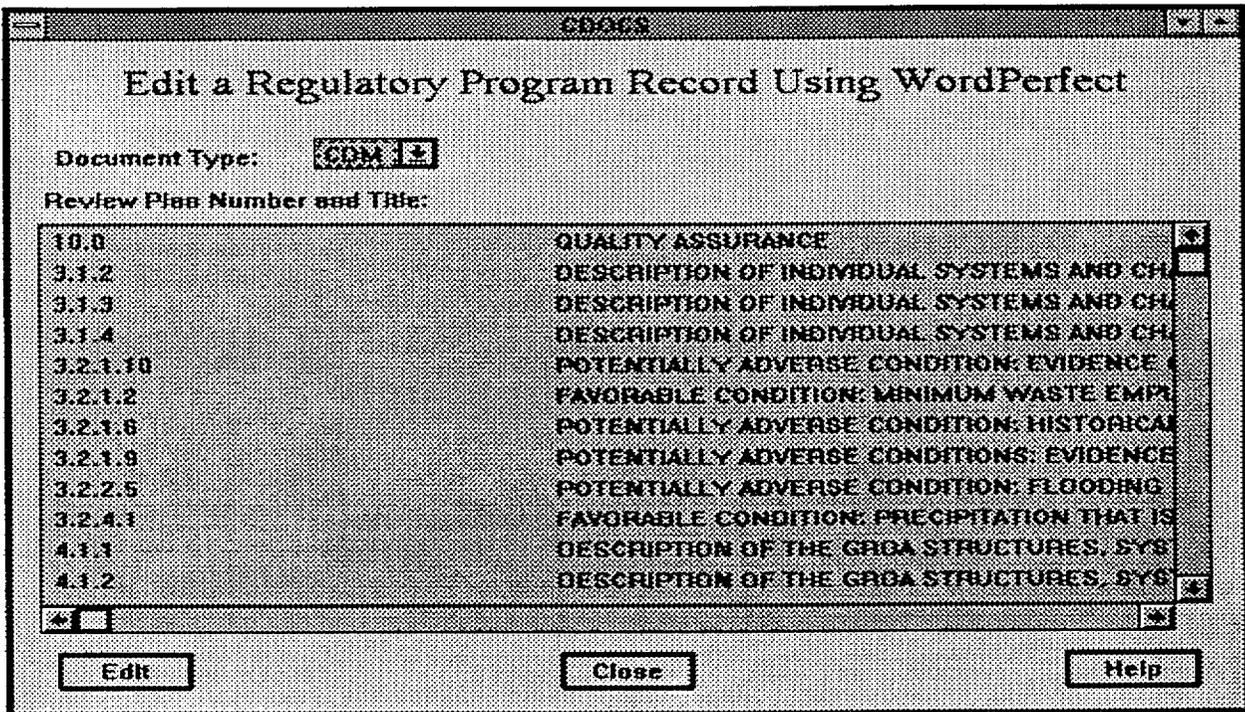


Figure 3-8. Edit a Regulatory Program Record Using WordPerfect screen

3. Select the *Document Type* pull-down list indicator to display the document types.
4. Select the desired document type from the *Document Type* pull-down list. Relevant information for the selected document type will appear in the list view. Note that the information in this list view may be scrolled horizontally and vertically.
5. Position your cursor in the list view and select the line that contains the desired record by clicking on it with the left mouse button. Visually review the record you have selected, and select a different record if necessary. When your selection is correct, select the *Edit* push-button at the bottom of the screen. This will cause the system to start WordPerfect using the record you have selected.
6. Edit the record using the WordPerfect software and then save it to a diskette or your hard disk using standard WordPerfect procedures.
7. To exit, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Edit* push-button, any information that you have entered will be discarded, and the record will not be edited using WordPerfect.
8. If you need assistance in using the edit function, select the *Help* push-button at the bottom of the screen to display additional information.

3.7.3 Operations—Exiting from the Consolidated Document System

To exit from CDOCS:

1. Select *Operations from the* menu bar of the *CDOCS Main Menu* (Figure 3-4). The system displays a pull-down menu (Figure 3-5). One of the options on the pull-down menu is for exiting CDOCS.
2. Select the *Exit* entry from the *Operations* pull-down menu. Alternatively, the mnemonic [x] may be typed or the accelerator key [F3] pressed. The system closes the users security permissions and authorities and terminates the CDOCS session. At this point, CDOCS has been successfully exited. To use CDOCS again, select the *CDOCS* entry on the desktop screen and perform a logon, if required, by entering User-ID and password through the *CDOCS Logon* screen (see Section B.2).

3.8 MAIN MENU—SEARCH ENTRY

CDOCS provides powerful and easy-to-use facilities for identifying and viewing records. The TOPIC search and retrieval software is used to find CDOCS records by searching for specific words or phrases in: (i) the text of the document, and/or (ii) document header fields.

3.8.1 Accessing the Search Facilities

The following steps are required to search for CDOCS records:

1. Select the *Search* entry from the menu bar of the *CDOCS Main Menu* (Figure 3-4). The system displays the *Search* pull-down menu (Figure 3-9).
2. Select the CDOCS entry from the *Search* pull-down menu. The *CDOCS Search Selection* displays as appropriate for NRC users (Figure 3-10) or CNWRA users (Figure 3-11) The search selection screen permits the user to select the document set or sets to be searched.

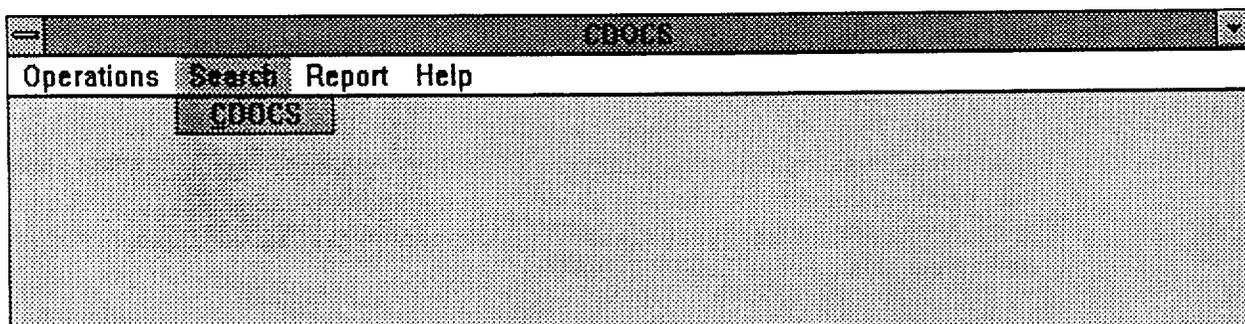


Figure 3-9. Search pull-down menu

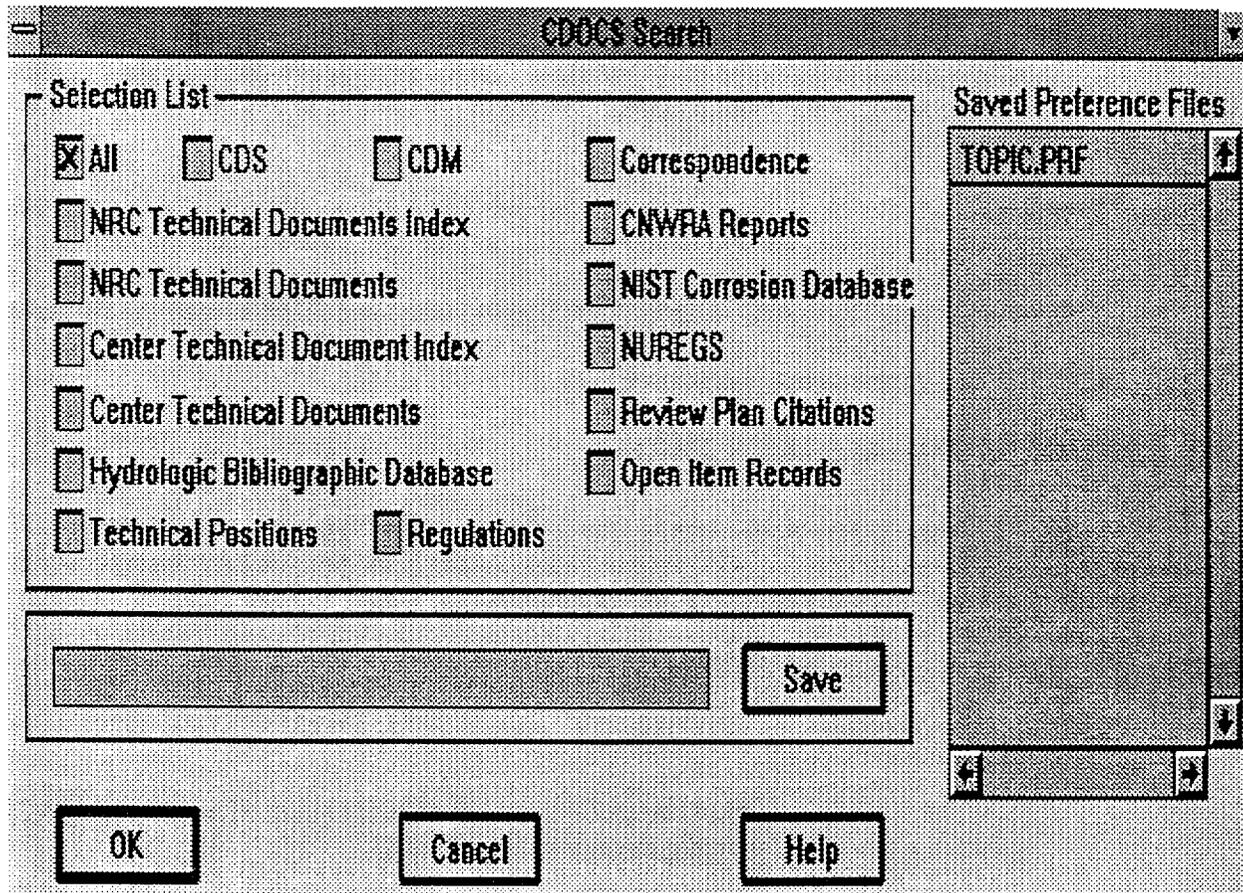


Figure 3-10. CDOCS Search Selection List for NRC users

3. Select the desired CDOCS document sets to be searched from the *Selection List* and click on the *OK* push-button at the bottom of the screen. The system starts the TOPIC search and retrieval facilities and displays a *TOPIC Query Entry* screen for simple queries (Figure 3-12). It takes a few seconds for the TOPIC full-text search and retrieval to be started, and several information and copyright screens display before the first *TOPIC Query Entry* screen appears.

If a message appears indicating some sort of problem with configuration and/or some of the parameters needed by the TOPIC software, document the message by pressing the [Print Screen] key, and contact the CNWRA Help Desk at (210) 522-5258, or the NRC System Administrator at (301) 415-8087.

Searches will be conducted on the entire content of the database for the selected document sets. Records entered full-text will have full-text and header information searched. Records entered with header information only will support searches only of that header information.

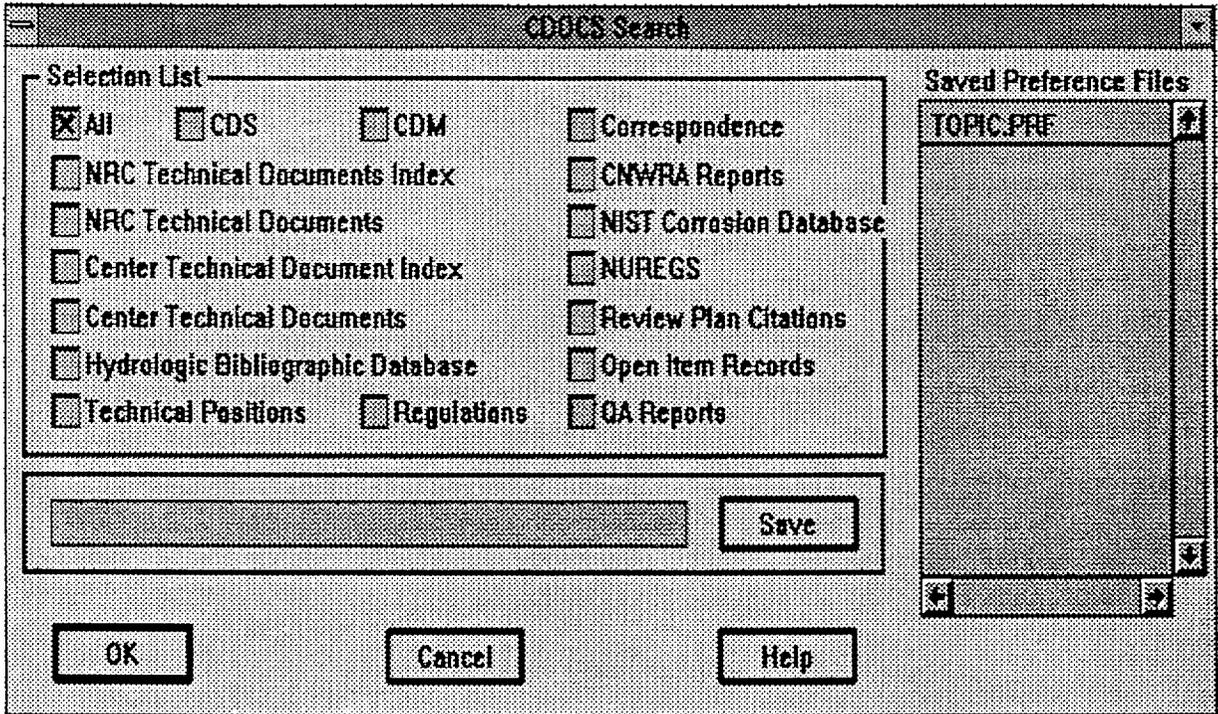


Figure 3-11. CDOCS Search Selection List for CNWRA users

When the TOPIC search facility has been started, two windows are displayed. The background window is the *TOPIC Main Menu*, which contains a menu bar that permits selection of options pertaining to the query. The foreground window is the *TOPIC Query Entry* screen (Figure 3-12). This window permits entry of words and/or phrases to be used in searching for records. The name of the current query appears in the shaded title bar at the top of the *TOPIC Main Menu* screen. New queries have default names such as Untitled-1, Untitled-2, etc. If the user selects to save the query, TOPIC will prompt for a file name for the query during the save process (See Section 3.8.9.2).

TOPIC queries are formulated in a very intuitive manner. The following summary of TOPIC syntax is intended to be an introduction that will permit the user to begin searching for records. Training will be provided as required. For more information on TOPIC syntax, contact the CNWRA Help Desk at (210) 522-5258, or the NRC System Administrator at (301) 415-8087.

Enter words, phrases, or expressions to find the desired record.

- **Words**—Enter a single word or multiple words separated by commas to formulate a TOPIC query. Each word is used individually to search for documents and/or document headers containing that word. When multiple words (separated by commas) are entered, TOPIC retrieves documents containing any of the specified words. Commas act as Boolean OR operators.

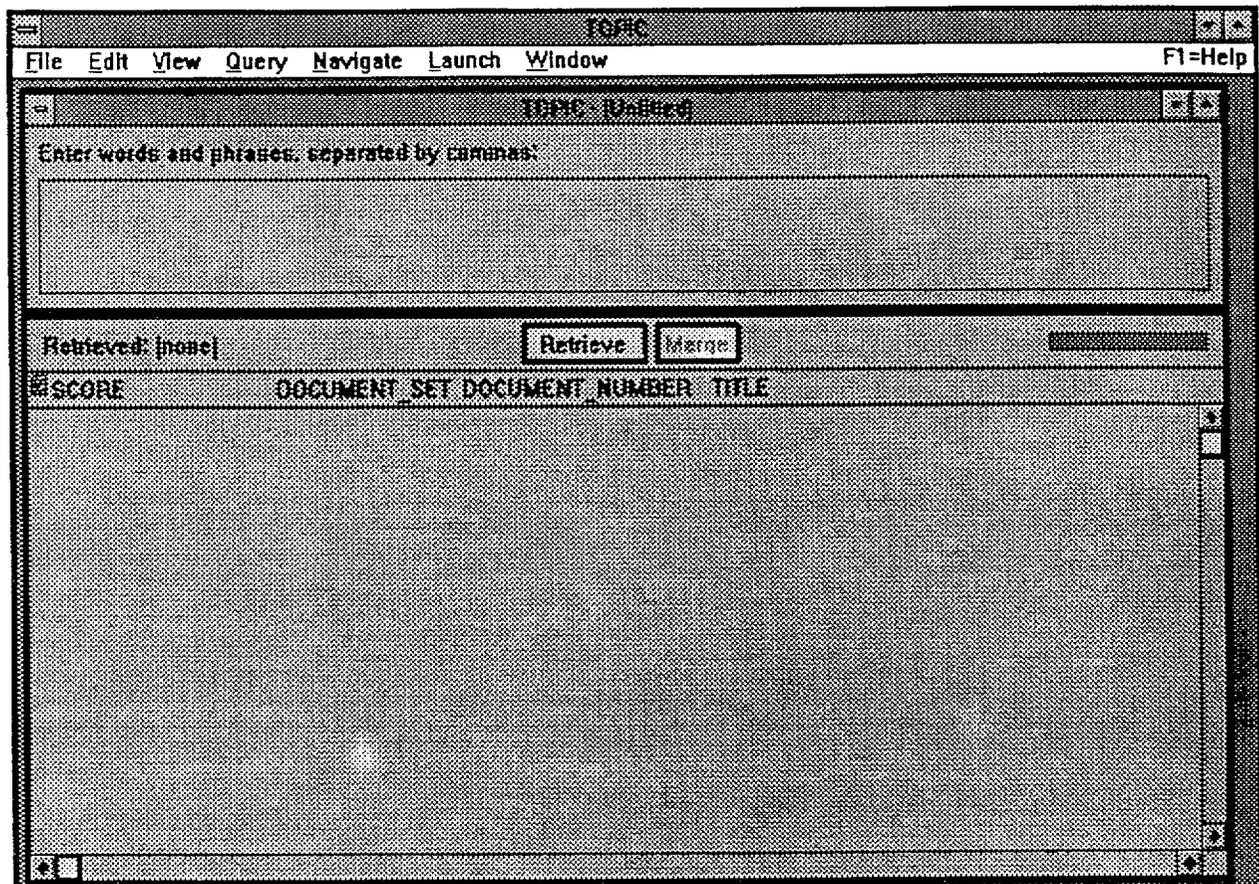


Figure 3-12. Topic Query entry screen

Words are considered to be stems in that endings are ignored. For example, if the word market is entered, TOPIC selects documents that contain “market,” “markets,” “marketing,” or “marketed.”

To look for a specific word, enclose it in double quotation marks to prevent it from matching as a stem.

Words are considered to be case insensitive. Thus, for search purposes, words may be entered in lowercase, uppercase, or mixed case.

- Phrases—Multiple words may be entered, without separating them with commas, and the system treats them as phrases and retrieves only documents that contain corresponding phrases.

To search for more than one phrase, separate the individual phrases with commas. For example, if the entry is RADIOACTIVE WASTE, HIGH-LEVEL WASTE, the system searches for documents containing either or both phrases.

Within phrases, TOPIC treats words as stems. Thus, if the search phrase entry is, HIGH-LEVEL WASTE, TOPIC selects documents that contain the phrases: (i) "high-level waste...", (ii) "high-level wastes...", (iii) "higher-level waste...", or (iv) "higher-level wastes... ."

To search for a specific phrase, enclose it in double quotation marks.

- Expressions—Indicate the required combinations of phrases and words by using special words such as "and," "or," and "not" to combine the words and phrases into expressions. When one of these reserved words is typed, TOPIC changes its appearance to indicate that the reserved word is being interpreted as a logical operator rather than as a word. For example, if the expression, WASTE AND CONTAINMENT is entered, the system interprets the word "and" as an operator, and displays the query terms as WASTE <AND> CONTAINMENT. This query would only retrieve documents that contain both the words "waste" and "containment."

To use a reserved word such as "and," "or," or "not" as a word in a phrase, it must be enclosed in quotation marks to prevent the system from interpreting it as an operator. For example, WASTE "AND" EMPLACEMENT would be interpreted as a phrase rather than an expression because "and" is enclosed in quotation marks.

3.8.2 Entering a Simple Query

For simple queries, the *TOPIC Query Entry* screen (Figure 3-12) permits the user to enter words, phrases, and/or expressions to search and to view the resulting list of selected documents. The *TOPIC Query Entry* screen for simple queries contains an upper pane and a lower pane, separated by a sash line. The upper pane contains an entry field that can be scrolled if necessary. Words and/or phrases that are to be used for searching are typed into the entry field under the prompt: *Enter words and phrases separated by commas*.

To enter a simple query:

1. Position the cursor in the *Enter words and phrases, separated by commas* entry field of the upper pane of the *TOPIC Query Entry* screen for simple queries (Figure 3-12) and press the left mouse button. This activates the entry field. If a vertical cursor bar does not appear in the upper left-hand corner of the entry field, it may be necessary to move the scroll bar at the right side of the entry field in order to position the cursor at the top of the entry field.
2. Type the desired word(s) and/or phrase(s) in the *Enter words and phrases, separated by commas* entry field. Note that the entry field is initially set up to display only a few lines. However, as many words and/or phrases can be entered as needed. If more information is typed in than can be held on a single line, the words wrap automatically to the next line. If more lines than can be displayed in the entry field are typed in, the text scrolls automatically. To see text that has been typed in that is not currently visible in the entry field: (i) move the vertical scroll bar at the right side of the entry field, or (ii) make the entry field larger by selecting and holding the dark bar below the entry field and then dragging the bottom of the entry field downward.

3. When all of the desired search words, phrases, and/or expressions have been entered, start the search either by: (i) pressing the [Return] or [Enter] key, or (ii) selecting the *Retrieve* push-button under the entry field. As the query is executed, several pieces of status information are displayed: (i) a colored bar at the right side of the window, under the entry field, fills from left to right to indicate how far the query has progressed; (ii) a message at the left side of the window, under the entry field, which has the form "Retrieved: 25 of 150" updates continuously to show how many documents have been selected and how many have been examined by the query; and (iii) the results list in the lower pane of the window fills from top to bottom with a description of the selected records.

3.8.3 Entering Form Queries

TOPIC also supports the ability to search for words and/or phrases in specific "header" fields, such as document title, document type, status, etc. This type of query is called a form query, because the input screen looks like a structured form. When using a form query, the upper pane of the *TOPIC Form Query Entry* screen (Figure 3-14) contains a list of available fields, each with its own entry field. For each header field and its associated entry field, there is an option labeled *Require*. If this option is selected for a field, the field will be required for the search to be satisfied. Otherwise, the field will be considered optional.

3.8.3.1 Selecting the Form Query Entry Mode

TOPIC normally starts in simple query mode. The first query screen will be formatted to accept simple queries. To enter a form query, change to *Form Query* mode.

To change TOPIC to form query mode:

1. Select the *Query* entry from the menu bar of the *TOPIC Main Menu* screen. A pull-down menu appears with various query options (see Figure 3-13).
2. Select the *Form Query* entry from the *Query* pull-down menu (Figure 3-13). The various search fields are displayed in the *TOPIC Form Query* entry screen (Figure 3-14).

Words and/or phrases may be entered into a form query just as in a simple query, but the words and/or phrases are associated with specific fields. Thus, if the word "earthquakes" is searched for in the *Title* field, the resulting query will select all documents with the word "earthquakes" in the title.

To enter search information into a form query:

1. Enter the search word(s) and/or phrase(s) in the entry field next to the desired header field.
2. Select the *Require* option for the field if the search information is required rather than optional.
3. Repeat Steps # 1 and 2 for each desired field.

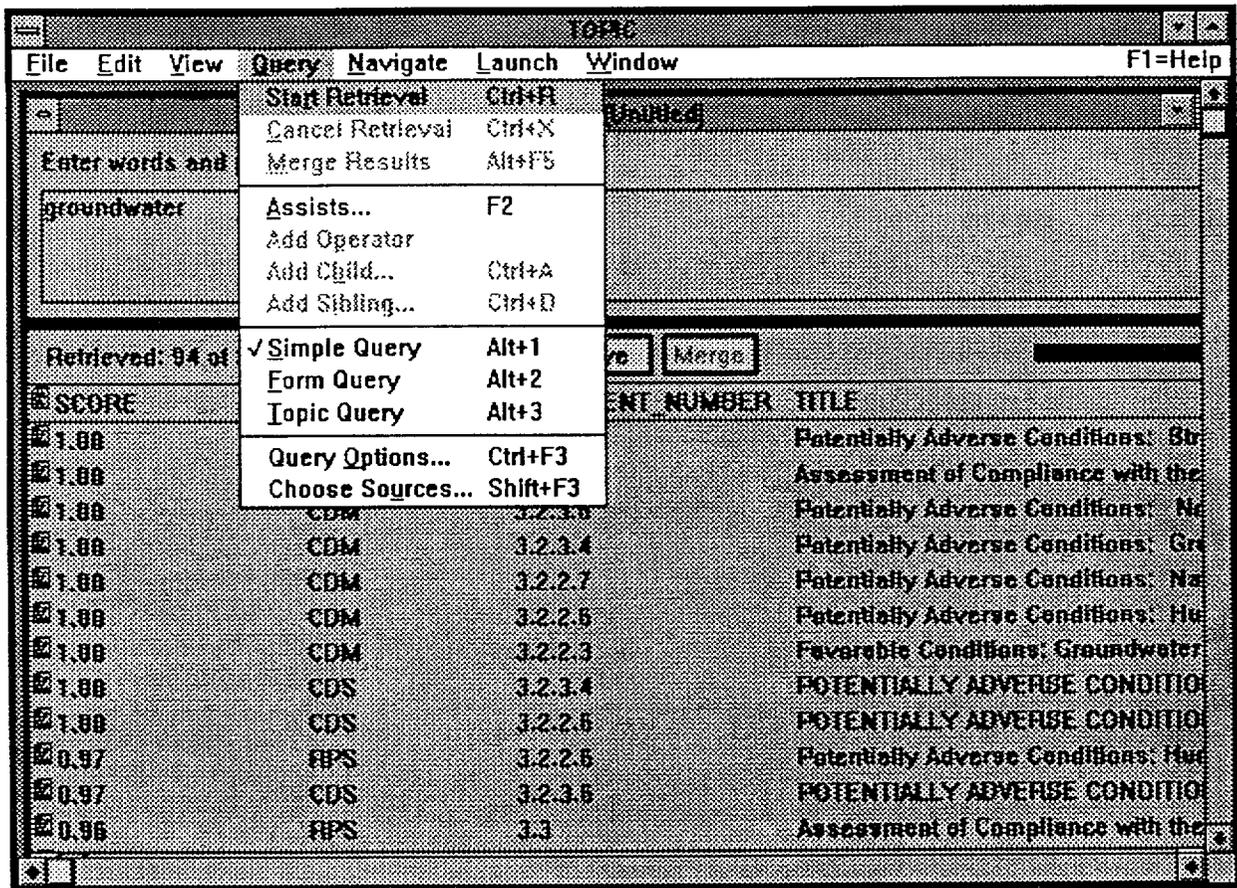


Figure 3-13. TOPIC Query pull-down menu

- When the search information for all desired fields has been entered, press the [Return] or [Enter] key or select the *Retrieve* push-button to start the query retrieval.

3.8.4 Selecting Documents for Viewing from the Results List

As a query runs, two pieces of information are updated in the status area immediately below the *Query Entry* pane. On the left of the status area, there is a message that displays the number of records selected out of the number of records that have been examined. On the right of the status area, there is a bar-indicator that fills with color, left to right, to indicate the percent of the query completed. When the bar is completely filled with color, the search has completed, and a brief description of the selected documents will appear in the results list located immediately below the status area (Figure 3-15). The results list contains the following information about each selected document:

DOCUMENT_SET—A code indicating the type of document (e.g., NTD, TDI, NIST, etc.).

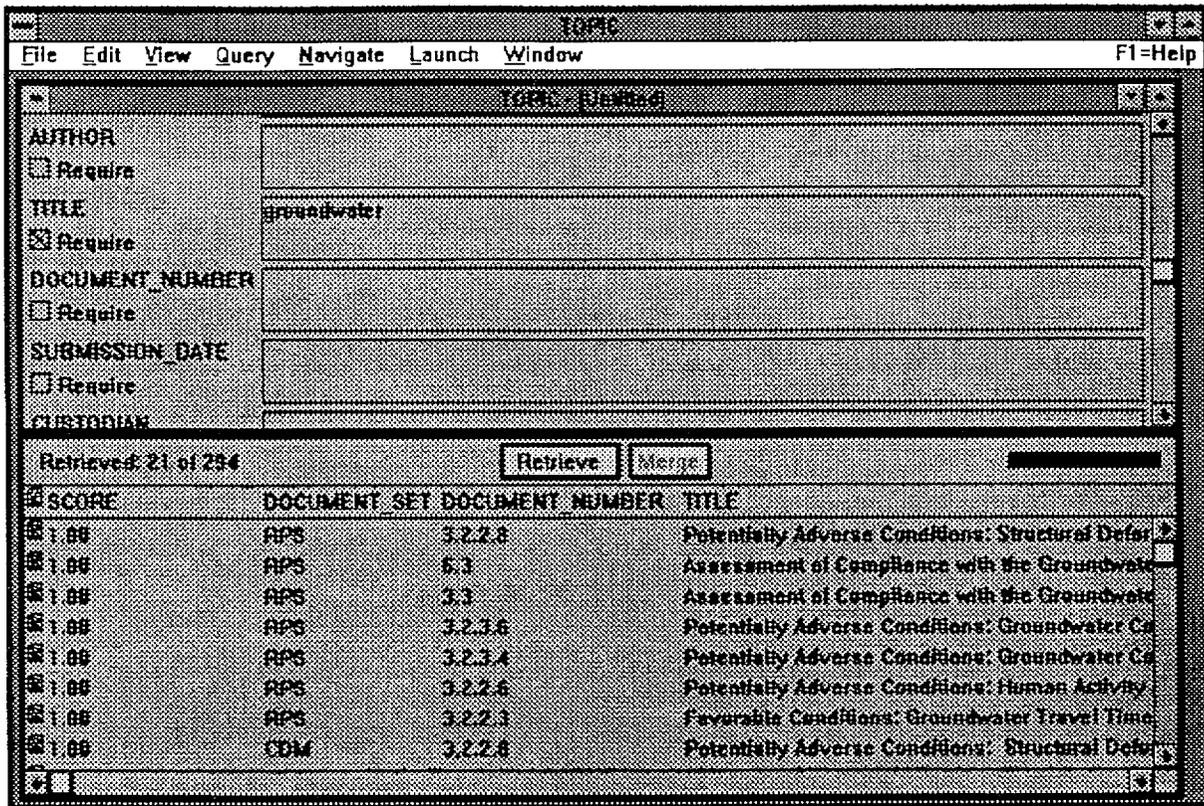


Figure 3-14. TOPIC Form Query entry screen

TITLE—The title of the document appears in this field. Note that the title may be too long to display within the results list pane. If this is the case, select and move the horizontal scroll bar indicator at the bottom of the results list to shift the display left or right as needed.

To select a document in the results list for viewing:

1. Select the desired entry in the results list. The selected information is retrieved and displayed in a separate window. Documents stored in full-text will be displayed. Documents stored as header information only will display the header information.
2. To view more than one document at a time, position the cursor and select additional documents. Each document is displayed in its own window.
3. The TOPIC window may be maximized to include the entire screen..
4. The individual document windows may be moved around within the TOPIC window to permit viewing of two or more documents concurrently. To move a document window: (i) position the cursor on the title bar, (ii) press and hold the mouse button, (iii) drag the

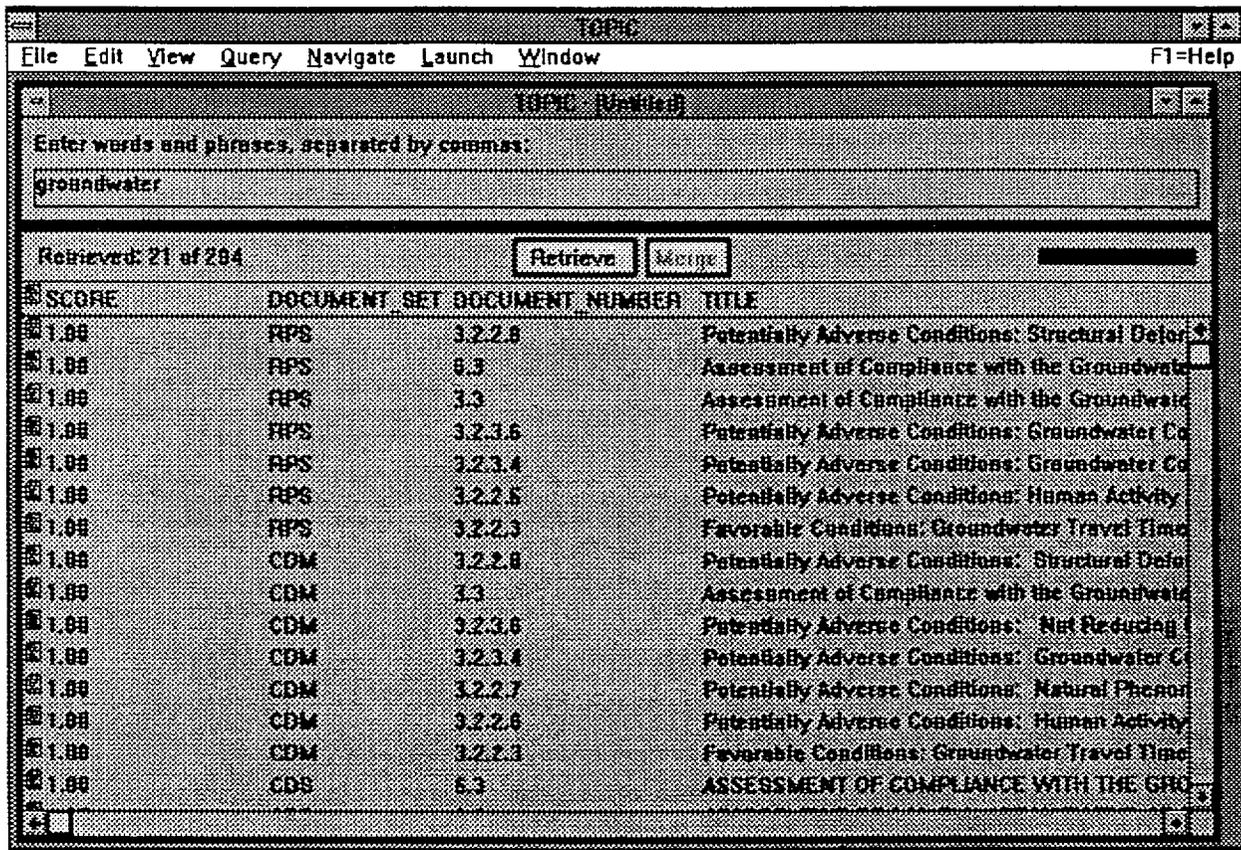


Figure 3-15. TOPIC results list

window to the desired location, and (iv) release the left mouse button to leave the window in its new position.

3.8.5 Viewing Selected Documents

When a full-text document has been selected from the results list for viewing, it will appear in a display window. The search term(s) used to retrieve the document will be highlighted (Figure 3-16), and "navigation" facilities are provided to permit a rapid "jump" through the document display to the next or previous occurrence of the search term

To search for the next or previous occurrence of the search term:

1. Select the *Navigate* options from the menu bar of the *TOPIC Main Menu*. The system displays the *Navigate* pull-down menu (Figure 3-17).

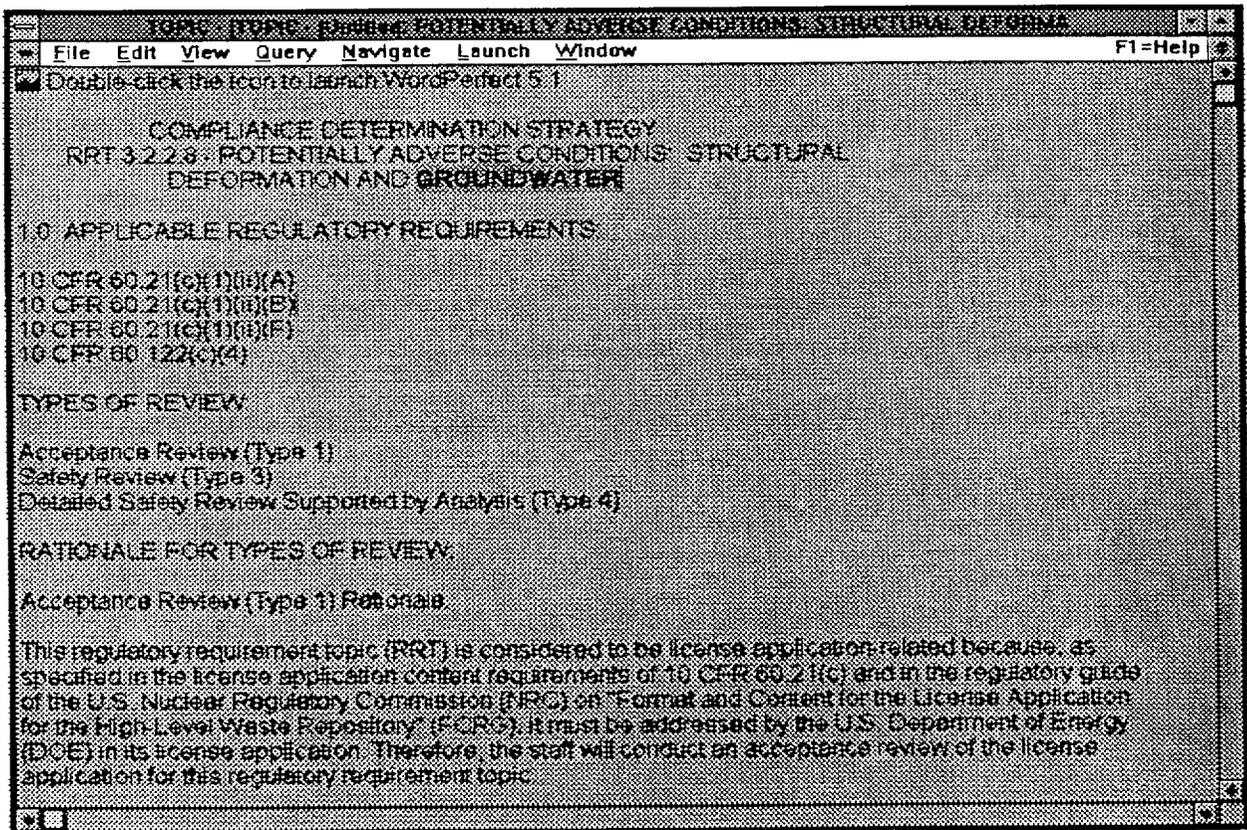


Figure 3-16. TOPIC document display

2. To find the next search term, select *Next Highlight*.
3. To find the previous search term, select *Previous Highlight*.

Facilities are provided to search for additional words and/or phrases that were not used as original search terms.

To find additional words and/or phrases in the text:

1. Select the *Navigate* option from the menu bar of the *TOPIC Main Menu*.
2. Select the *Find Text* entry in the *Navigate* pull-down menu. Another entry window is displayed where the word(s) or phrase(s) that are to be found can be entered (Figure 3-18).
3. Enter the desired word(s) or phrase(s), and select *Find Next* to find the next occurrence or *Find Previous* to find the previous occurrence.
4. Select *Cancel* to exit from the text search window.

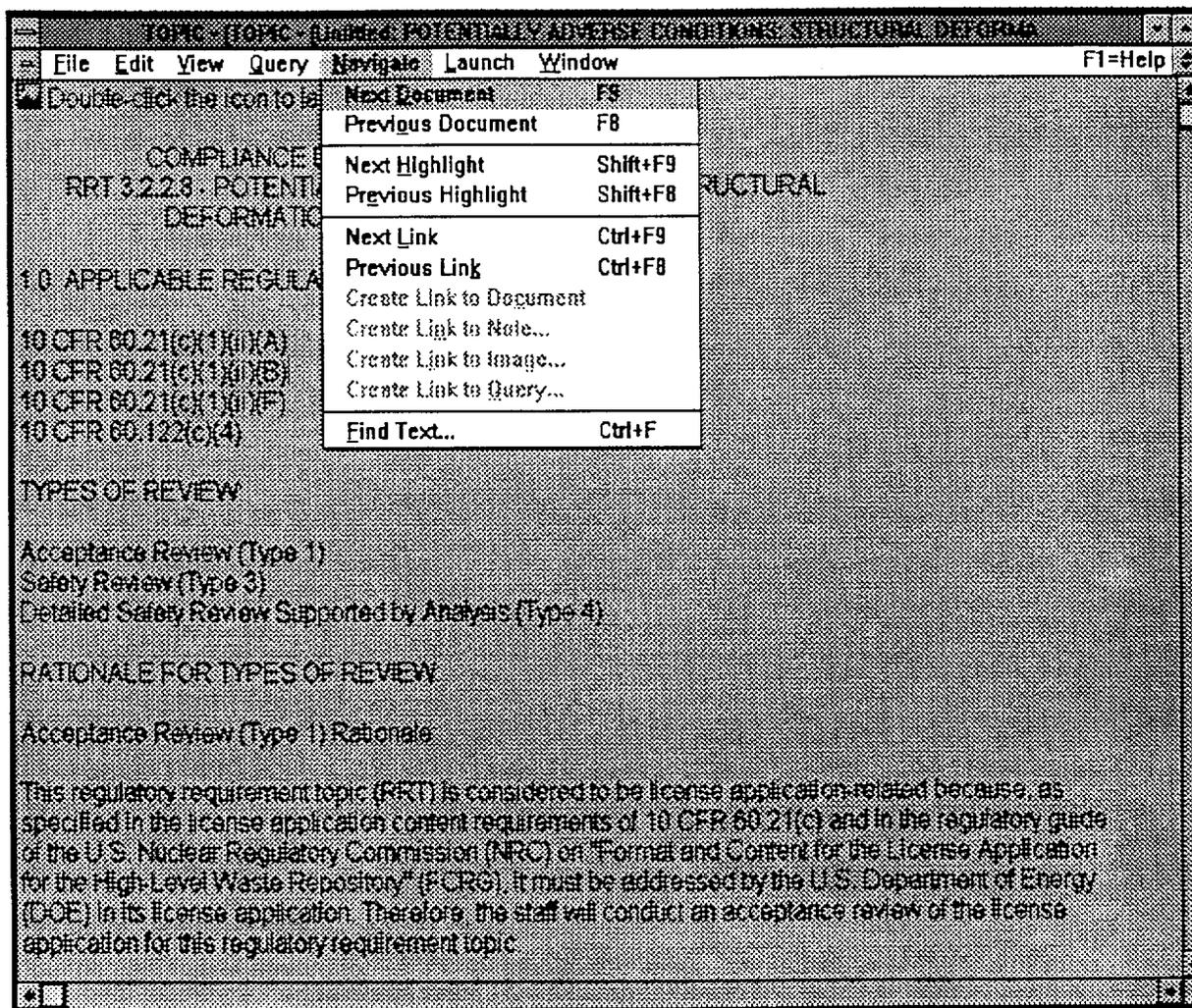


Figure 3-17. TOPIC Navigate pull-down menu

Facilities are also provided to display the next or previous document in the selection list.

To display the next or previous document in the selection list:

1. Select the *Navigate* option from the menu bar of the *TOPIC Main Menu*.
2. To display the next document in the selection list, select *Next Document*.
3. To find the previous document in the selection list, select *Previous Document*.

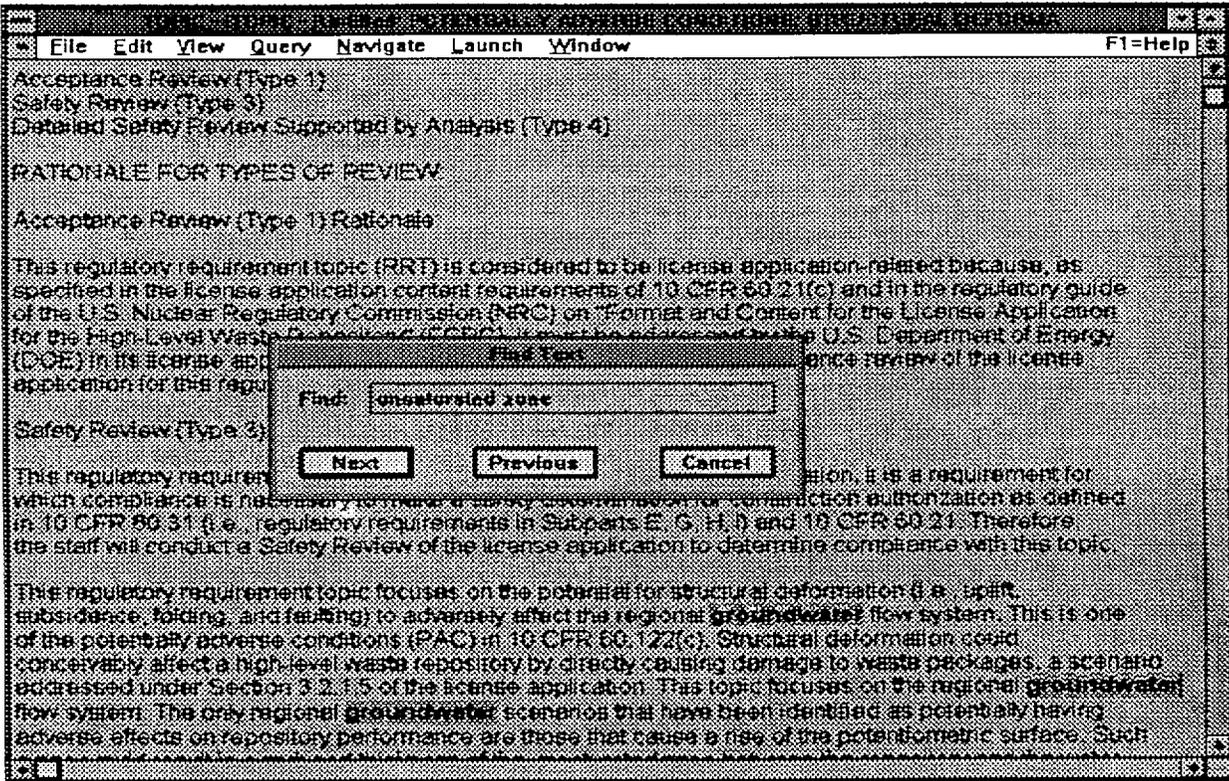


Figure 3-18. TOPIC navigation facilities find text screen

3.8.6 Launching WordPerfect

A full-text document that has been selected for display may be viewed and/or edited with WordPerfect, but, it may not be saved directly into CDOCS. However, the user may freely access records from CDOCS, modify them, incorporate them into other work products, or save them on a local hard disk or a diskette.

When a full-text document has been selected for display using the CDOCS search facilities, an icon and descriptive line (i.e., *Edit document*) appears at the top of the document (see Figure 3-19). If this icon is clicked, the system will start a WordPerfect session in another window using the selected document. WordPerfect functions can then be performed on this document. If the results of the WordPerfect session are saved, the WordPerfect save action will not modify the record in CDOCS.

3.8.7 Displaying Images

Many full-text documents contain graphical images, figures, etc., that may be displayed through the image display facilities of TOPIC. Images and text are stored in different formats, and a special facility is required to display images. The normal TOPIC display for documents includes the text and icons representing any graphical images. Figure 3-19 illustrates a document that contains an image represented

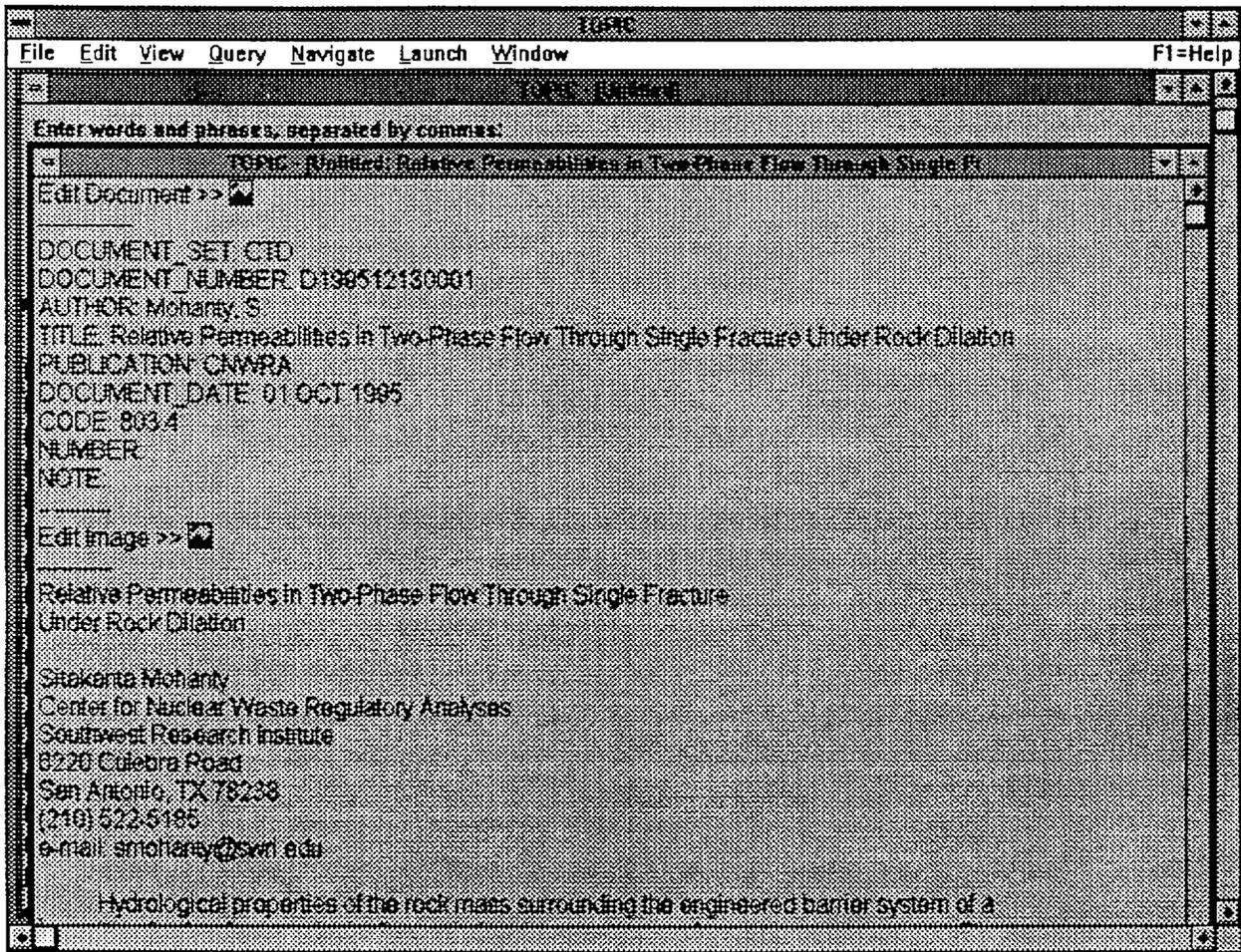


Figure 3-19. TOPIC document display containing image icons

by an icon embedded in the text. If an image icon is clicked, the system will start the image viewer in another window using the selected image (Figure 3-20).

To view an embedded image from a TOPIC document display:

1. Click on the icon for the desired image. The system displays the image in a separate window (Figure 3-20).
2. When finished viewing the image, close the image window by clicking on the upper left corner of the window and selecting *Close* from the pull-down menu.

3.8.8 Exiting from the Record Search Facility

To exit from the *Search* facility:

1. Select the *File* entry in the menu bar at the top of the *TOPIC Query Entry* screen. The system displays the *File* pull-down menu (Figure 3-21)..

Relative Permeabilities in Two-Phase Flow Through Single Fracture Under Rock Dilation

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Hydrological properties of the rock mass surrounding the engineered barrier system of a repository for the deep geologic disposal of nuclear waste may change due to various conditions such as stress changes around the repository from construction activities, dynamic ground motion associated with earthquakes, and rock thermal expansion due to the heat released from buried waste. These changes may result in large scale dynamic rock shearing which may cause fracture dilation and/or closure. The shearing process may continue well after permanent closure of the repository. All these aspects may alter the capability of fractures to conduct fluid. The presence of heat could result in thermal-mechanical-hydrological (TMH) coupled processes which must be understood in order to determine the fluid saturation distribution in the repository near-field. Modeling such coupled processes at very large scales with imbedded fracture networks requires understanding fluid flow behavior and transport at a smaller scale, such as the scale of a single fracture.

In this study, two-phase relative permeabilities of a single fracture to air and water have been numerically investigated as part of an analysis of mechanical-hydrological (MH) coupled processes. Aperture distribution and surface roughness data acquired from a single rock joint from



Figure 3-20. TOPIC image display

2. Select the *Exit* entry from the *File* pull-down menu. TOPIC displays a message asking whether to save or discard the current query and waits for a response (Figure 3-26).
3. In most cases, it is not desirable to save the current query. Select the *Discard* push-button under the message. The TOPIC full-text search and retrieval environment terminates, and the *CDOCS Main Menu* displays again.

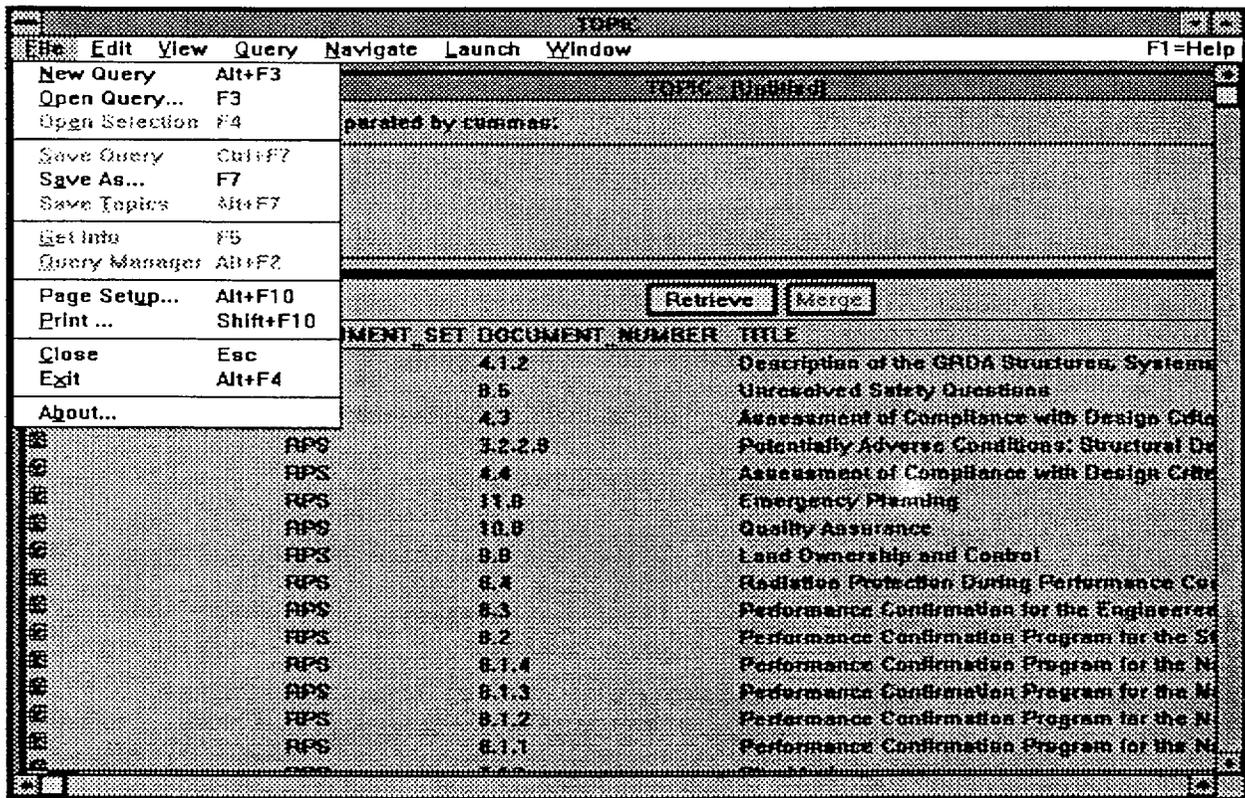


Figure 3-21. TOPIC File pull-down menu

3.8.9 TOPIC—Detailed Functions

The following sections discuss items from the *TOPIC Main Menu* along with their associated pull-down menus in greater detail. Only selected features of the TOPIC full-text search and retrieval software are discussed in this *User's Guide*. For further information, see the appropriate TOPIC user's guide for the hardware/software platform or call the CNWRA Help Desk at (210) 522-5258, or the NRC System Administrator at (301) 415-8087.

The menu bar of the *TOPIC Main Menu* contains entries that provide access to a number of capabilities of the TOPIC search and retrieval software. The *TOPIC Main Menu* bar options are:

File—Start new queries and save the current query

Edit—Cut, copy, paste, and search for specific text in a document display

View—View different document displays

Query—Change the type of query

Launch—Start other programs such as WordPerfect

Help—Get additional Help information

3.8.9.1 TOPIC Main Menu—File Entry

The TOPIC *File* pull-down menu is illustrated in Figure 3-21

When the *File* entry in the *TOPIC Main Menu* is selected, the *File* pull-down menu appears. This pull-down menu contains the following options:

New Query—Begin a new query definition

Open Query—Open a previously defined and saved query so that it may be used and/or modified

Open Selection—Open a selected item into a new window

Save Query—Save the current query so that it may be used again and/or modified in the future

Save As—Save the current query using a specified file name

Save Topics—Save changes made to the TOPIC database during the current session

Get Info—Display a window containing additional information about a selected document

Query Manager—Display a window containing a list of the available queries

Page Setup—Change the printer, margins, and/or page size used when printing information directly from TOPIC

Print—Print information from the currently selected TOPIC screen

Close—Close the currently selected TOPIC query screen

Exit—Close all TOPIC query screens and exit from the TOPIC search and retrieval system

Those TOPIC options which are most commonly used in the CDOCS are discussed as follows.

TOPIC File Pull-down Menu—New Query Entry

The *New Query* entry in the *File* pull-down menu permits start of a new query. If an existing query is active, that screen remains but an additional new query screen is created. The options selected in the TOPIC preference file determine the initial settings of query screens. Normally, a new query is started as a simple query. If a different type of query screen is desired, (e.g., a form query), change the query type by selecting the *Query* entry from the *TOPIC Main Menu*. (For a further discussion of how to select a different query type, see Section 3.8.3.1).

To start a new query:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *New Query* entry from the *File* pull-down menu. A new screen is created using the default query type (normally a simple query).
3. To access a different type of query screen, use the *Query* entry in the *TOPIC Main Menu* to change the query type (see Section 3.8.3.1).

TOPIC File Pull-down Menu—Open Query Entry

The *Open Query* entry in the *File* pull-down menu permits retrieval of the definition of an existing query that was previously stored. If an existing query is active, that screen will remain but a new query screen will be created for the query that is being retrieved. The options selected for the existing query that is being opened will determine the initial settings of the query screen.

To open an existing query:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Open Query* entry from the *File* pull-down menu. An entry screen appears to permit location and selection of the name of the query definition file (Figure 3-22).

TOPIC File Pull-down Menu—Save Query Entry

The *Save Query* entry in the *File* pull-down menu permits definition of the current query to be saved so that it can be retrieved and used in the future. The *Save Query* entry is normally used to save and update the definition of a named query that had been previously saved. The query name will not be changed. If the entry is used for a new query, a prompt will request the path and file name for the query (See Figure 3-23).

To save an existing query:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Save Query* entry from the *File* pull-down menu. If a previously named query is being saved, the query definition is saved, and no further action is required.

If an unnamed query is being saved, one that has not previously been saved, an entry screen appears so that a path and file name for the query definition can be selected.

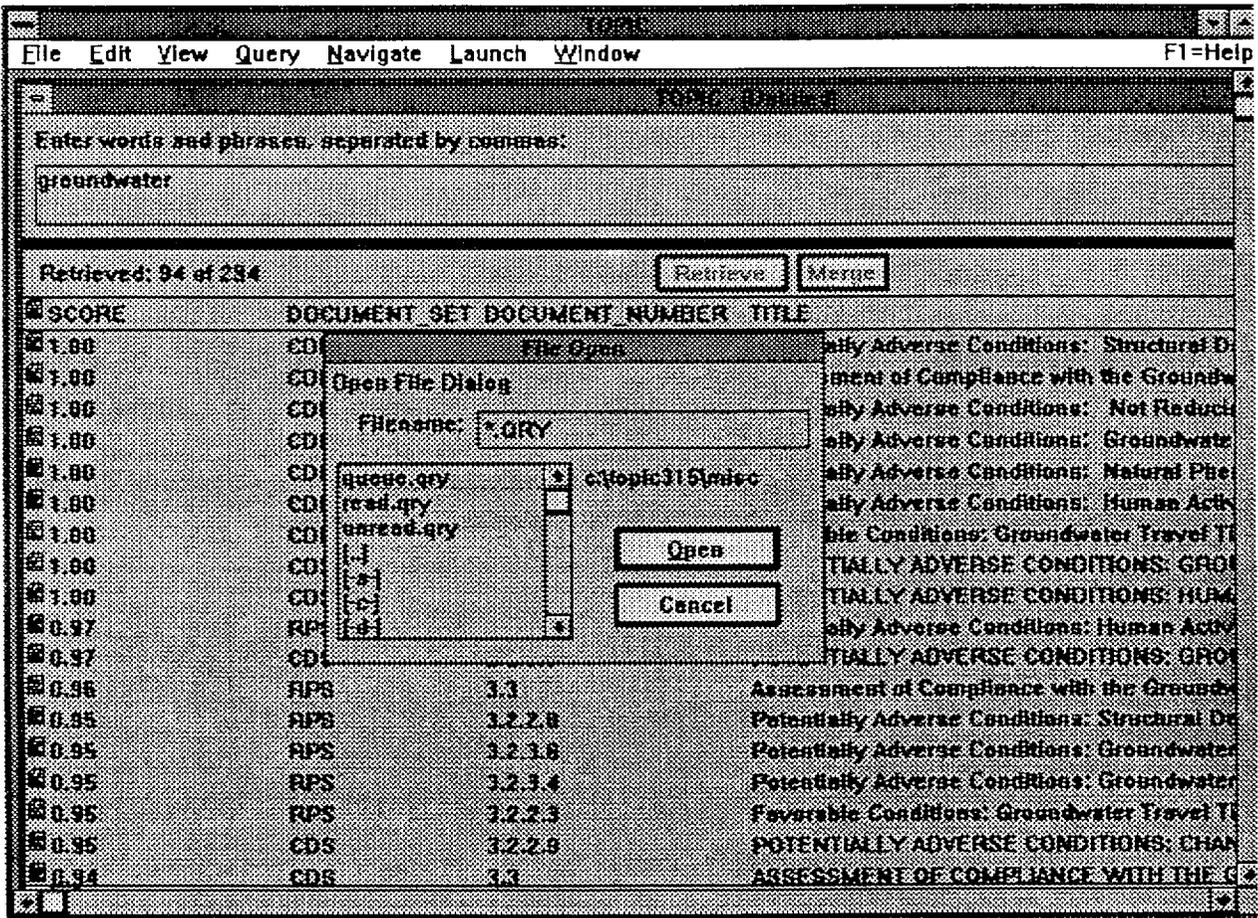


Figure 3-22. TOPIC Open Query screen

TOPIC File Pull-down Menu—Save As Entry

The *Save As* entry in the *File* pull-down menu permits the definition of the current query to be saved with a new name, so that it can be retrieved and used in the future. The *Save As* entry is normally used to save an existing query definition, which has been updated, with a new name.

To save an existing query using a new name:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Save As* entry from the *File* pull-down menu. An entry screen appears so that a path and file name may be selected for the query definition (Figure 3-23).
3. Select the desired path and enter the desired file name for the query. If possible, the name of the query should be descriptive and meaningful to support easy retrieval.

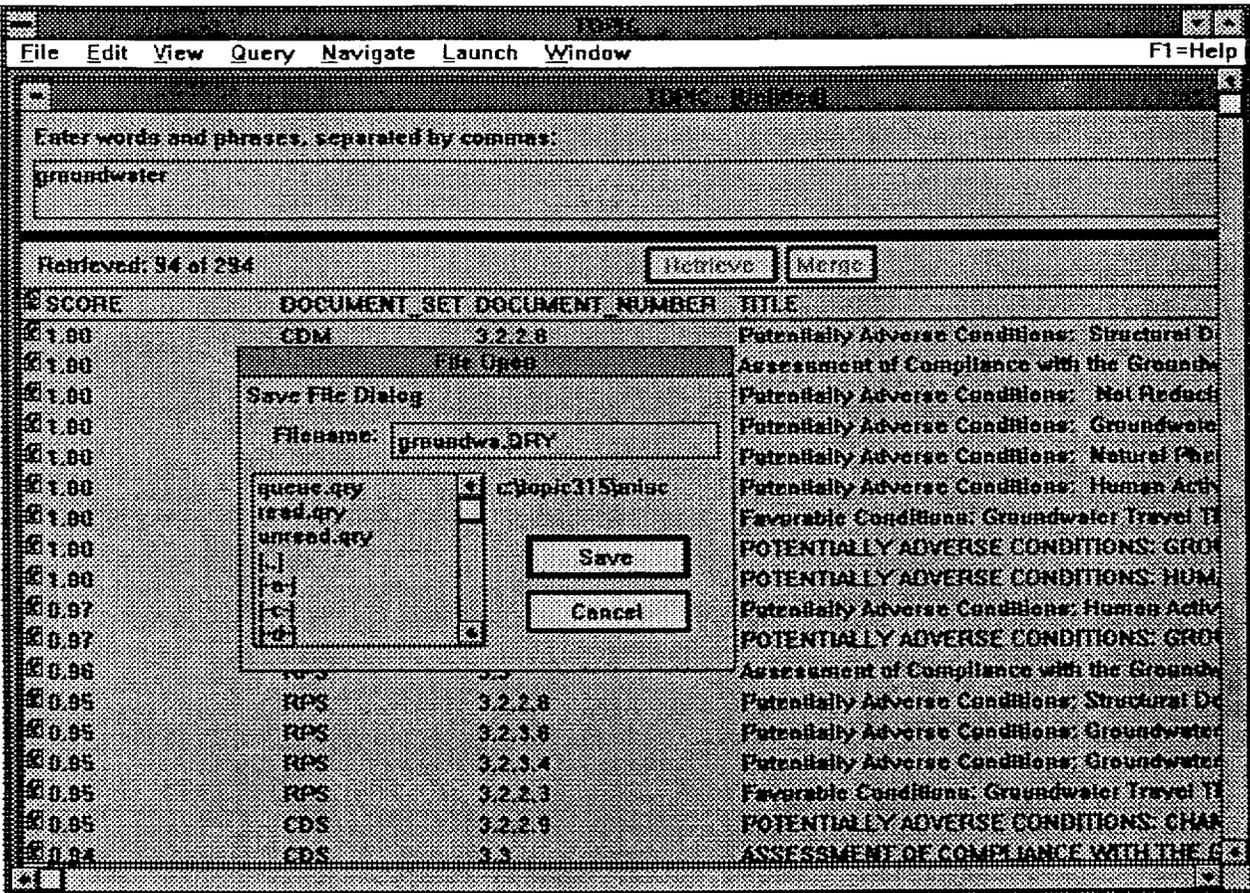


Figure 3-23. TOPIC Save Query screen

4. Select the *OK* push-button at the bottom of the entry screen to save the query.

TOPIC File Pull-down Menu—Page Setup Entry

The *Page Setup* entry in the *File* pull-down menu permits options to be set, including page height, page width, and margins, that control the appearance of printed information produced by TOPIC.

To change the options for the setup of printed pages:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Page Setup* entry from the *File* pull-down menu. An entry screen appears so that page setup options may be entered and/or changed (Figure 3-24).
3. Enter the desired values in the entry fields for *Page height*, *Page width*, *Left margin*, *Right margin*, *Top margin*, and *Bottom margin*.

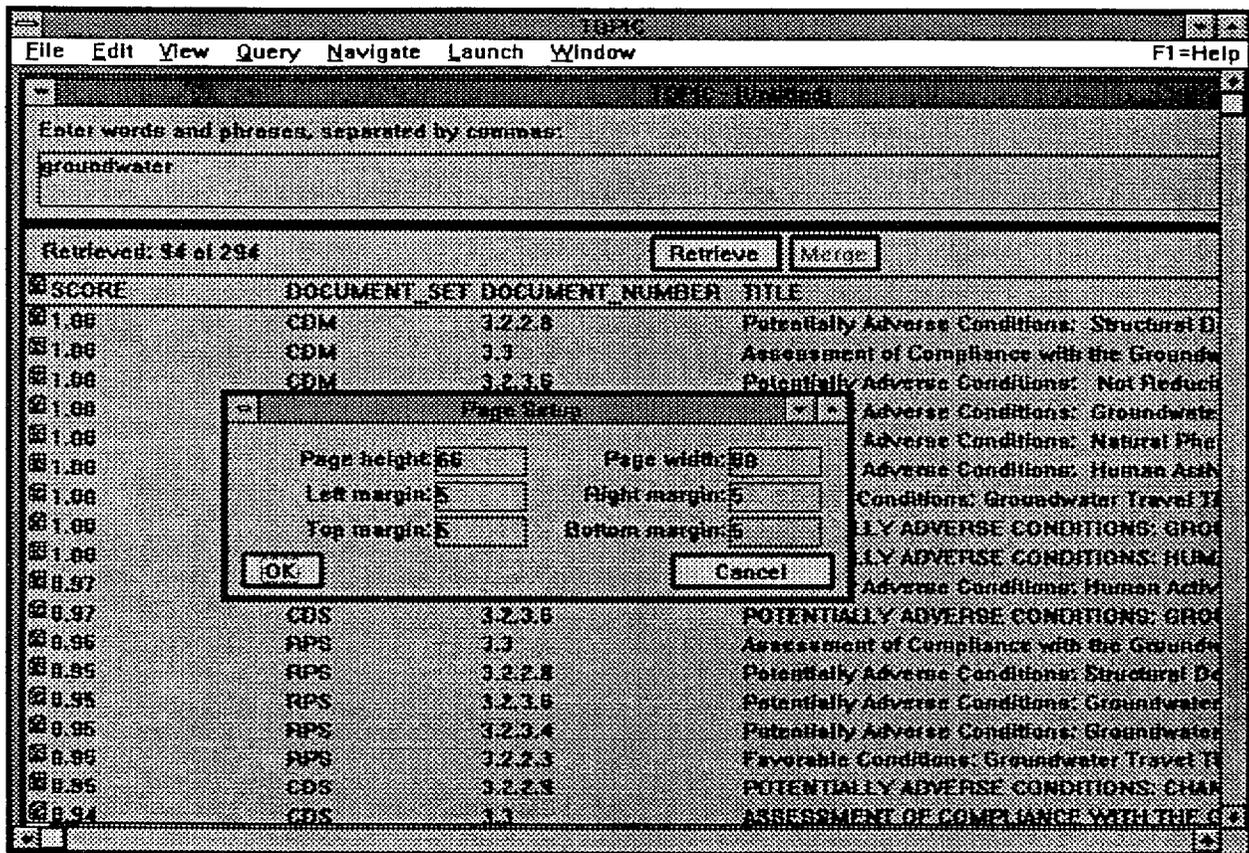


Figure 3-24. TOPIC Page Setup screen

4. Select the *OK* push-button at the bottom of the entry screen to save the page setup options.
5. Select the *Cancel* push-button at the bottom of the entry screen to exit from the *Page Setup* entry screen without updating the page setup options.

TOPIC File Pull-down Menu—Print Entry

The *Print* entry in the *File* pull-down menu permits setting options that control printing information produced by TOPIC.

To change the options for printing:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Print* entry from the *File* pull-down menu. An entry screen appears so that print options can entered and/or changed (Figure 3-25).

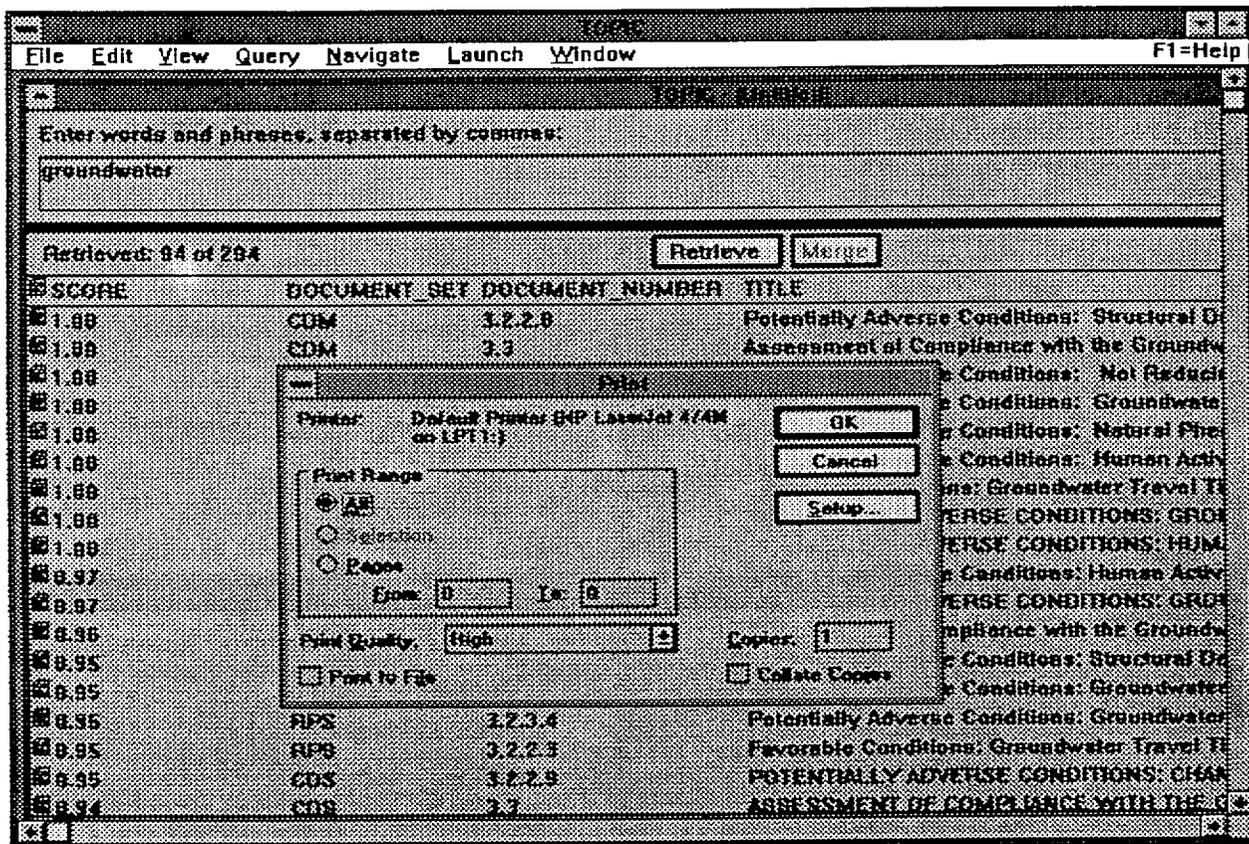


Figure 3-25. TOPIC Print screen

3. Enter the system name of the desired printer device in the *Printer* entry field. Contact the CNWRA Help Desk at (210) 522-5258, or the NRC System Administrator at (301) 415-8087 for specific information on printer devices.
4. Select the option button for *Print all* to indicate whether to print the entire document or just selected pages. If the *Print all* button is depressed, the entire document is printed. If the *Print all* button is not depressed, only the specified pages of the document are printed; the beginning page must be entered in the *From* entry field and the ending page in the *To* entry field.
5. Select the *OK* push-button at the bottom of the entry screen to print the document and save the print options.
6. Select the *Cancel* push-button at the bottom of the entry screen to exit from the *Print* options screen without printing the document.

TOPIC File Pull-down Menu—Close Entry

The *Close* entry in the *File* pull-down menu permits closing the current query window without exiting TOPIC. When the window is closed, TOPIC will display a screen that permits the current query to be saved or discarded (Figure 3-26).

To close the current query window:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Close* entry from the *File* pull-down menu. A screen appears that provides a choice of either discarding or saving the current query.
3. Select the *Save* push-button to save the current query. This causes the TOPIC *Save Query* screen to appear (Figure 3-23).

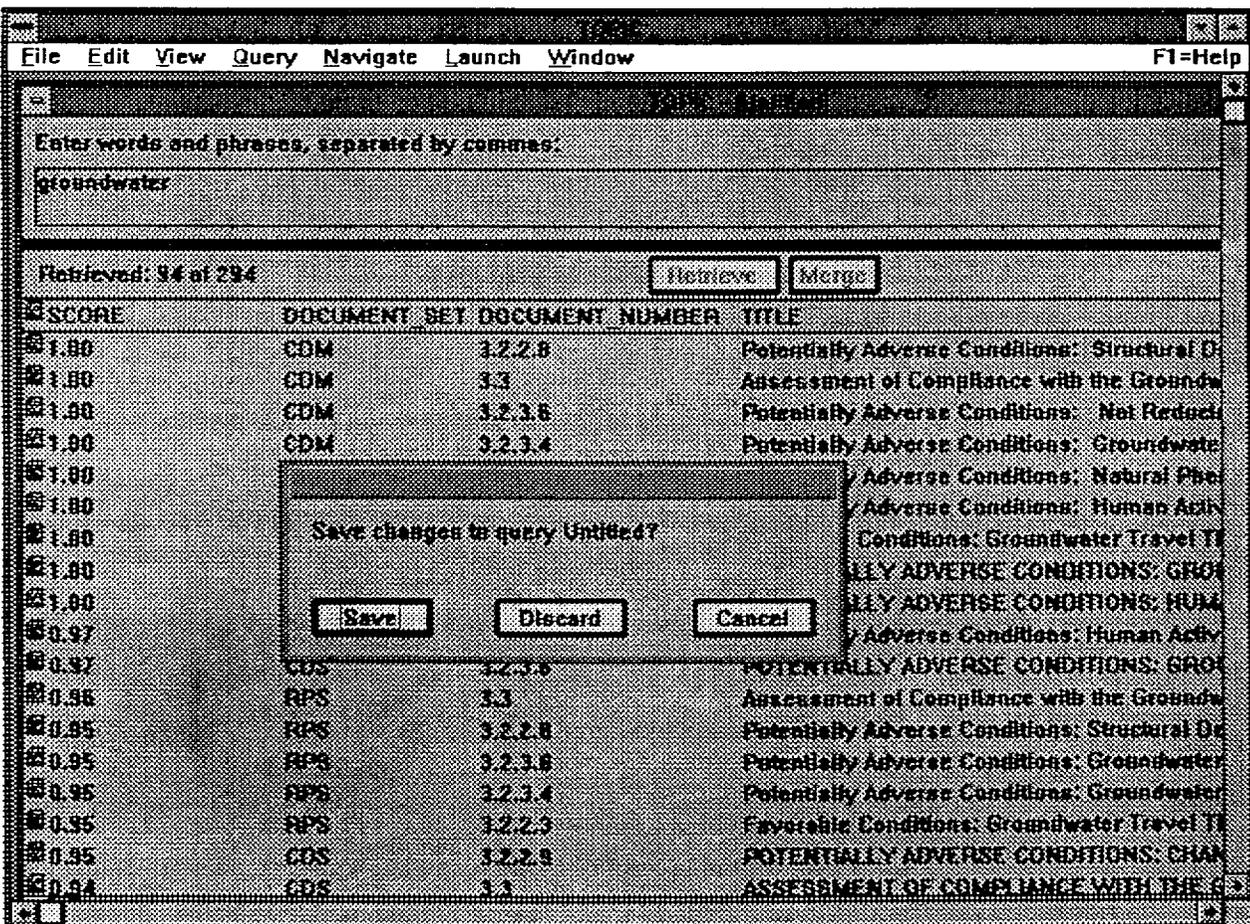


Figure 3-26. TOPIC Close screen

4. Select the *Discard* push-button to close the current query screen without saving the query.
5. Select the *Cancel* push-button to exit from the *Close* options screen without closing the current query

TOPIC File Pull-Down Menu—Exit Entry

The *Exit* entry in the *File* pull-down menu permits closing all active current query windows and exit from TOPIC. When the last window is closed, TOPIC will display a screen that permits the user to exit.

To exit TOPIC:

1. Select the *File* entry from the menu bar of the *TOPIC Main Menu*. The *File* pull-down menu appears.
2. Select the *Exit* entry from the *File* pull-down menu. A screen appears that allows cancelling the query and exiting from TOPIC.

3.8.9.2 TOPIC Main Menu—Edit Entry

When the *Edit* entry is selected from the menu bar of the *TOPIC Main Menu*, the *Edit* pull-down menu appears (Figure 3-27). This menu contains the following options:

Undo—Reverse the previous operation to undo its effects

Cut—Remove the highlighted text and copy it to a temporary area called the clipboard

Copy—Copy the highlighted text to the clipboard.

Paste—Insert the contents of the clipboard at the location of the cursor

Clear Selection—Clear the selected TOPIC, document, etc., in a window

Delete Selection—Delete the selected topic, document, etc., from the TOPIC database

Select All—Highlight the entire text of the area identified by the cursor

Add to Query—Add current query selections to an existing named query

The TOPIC *Edit* pull-down menu is illustrated in Figure 3-27 . Those TOPIC options which are most commonly used in CDOCS are described below.

TOPIC Edit Pull-down Menu—Undo Entry

The *Undo* entry in the *Edit* pull-down menu permits reversing of the previous action. The *Undo* option is not always available because some actions do not lend themselves to being reversed. In these

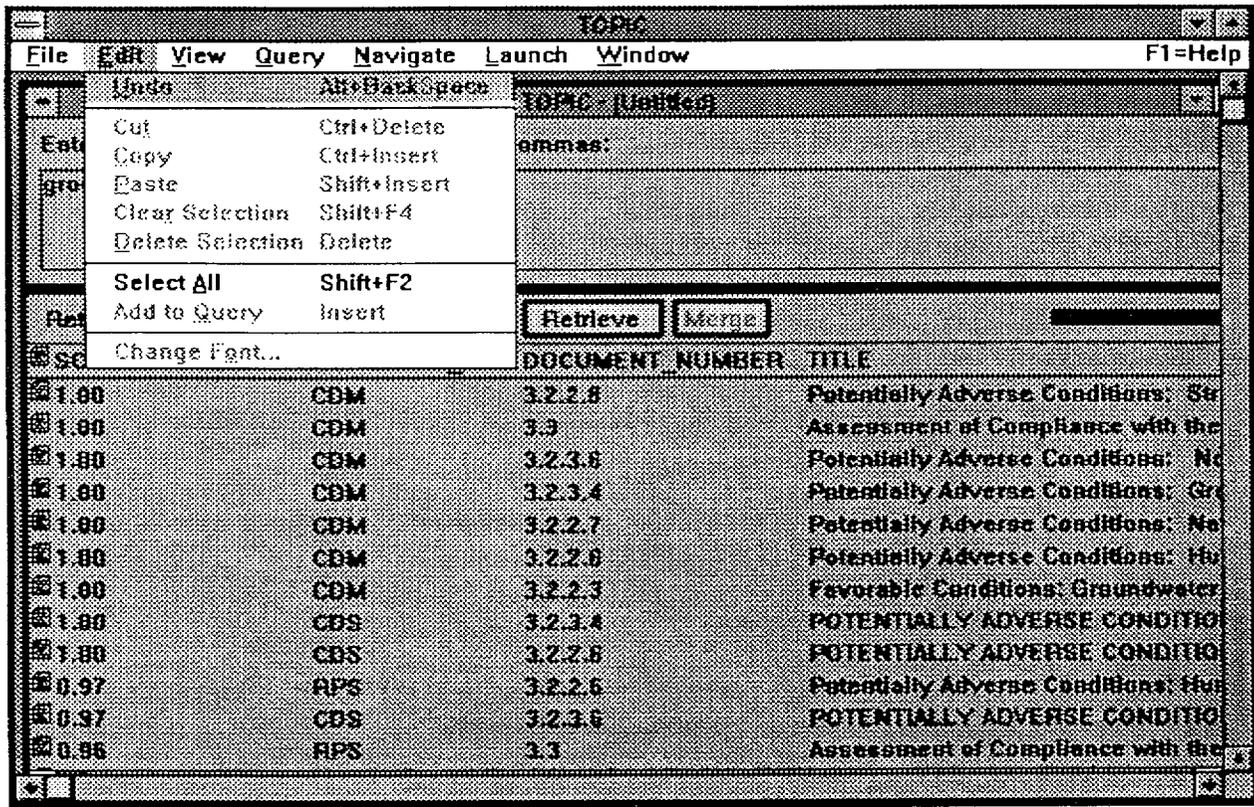


Figure 3-27. TOPIC Edit pull-down menu

circumstances the *Undo* option is grayed to indicate that it is not available. When the *Undo* option is available and is selected, the system is restored to its state before the previous operations. For example, if a *Select All* operation had been performed, the entire document would be highlighted. Selecting the *Undo* option would reverse the highlighting resulting from the *Select All* option.

TOPIC Edit Pull-Down Menu—Cut Entry

The *Cut* entry in the *Edit* pull-down menu permits the user to remove highlighted text from the document and insert it in a temporary area called the clipboard. After text has been inserted into the clipboard by either the *Cut* or *Copy* operation, it may be inserted into a document using the *Paste* operation.

To use the *Cut* option:

1. Highlight the text that is to be cut by positioning the cursor at the first character, depressing and holding the left mouse button, moving the cursor to the last character to be cut, and releasing the left mouse button (click and drag).

2. Select the *Cut* option from the *Edit* pull-down menu. The highlighted text is removed from the current document and stored in the clipboard. A *Cut* operation replaces the previous contents of the clipboard.

TOPIC Edit Pull-down Menu—Copy Entry

The *Copy* entry in the *Edit* pull-down menu permits the user to copy highlighted text from the document and insert it in a temporary area called the clipboard. After text has been inserted into the clipboard by the *Copy* operation, it may be inserted into a document using the *Paste* operation.

To use the *Copy* option:

1. Click and drag to select the text for copying.
2. Select the *Copy* option from the *Edit* pull-down menu. The highlighted text is stored in the clipboard. The *Copy* operation replaces the previous contents of the clipboard.

TOPIC Edit Pull-down Menu—Paste Entry

The *Paste* entry in the *Edit* pull-down menu permits inserting the contents of the clipboard at the location of the cursor.

To use the *Paste* option:

1. Position the cursor at the location where the contents of the clipboard are to be inserted and click the left mouse button to establish the new cursor location.
2. Select the *Paste* option from the *Edit* pull-down menu. The contents of the clipboard are inserted at the cursor location. The *Paste* operation does not affect the contents of the clipboard. Therefore, the contents of the clipboard may be pasted repeatedly at different locations in the document.

TOPIC Edit Pull-down Menu—Select All Entry

The *Select All* entry in the *Edit* pull-down menu permits highlighting an entire document.

To use the *Select All* option:

1. Position the cursor on the document to be selected and click the left mouse button to establish the new cursor location.
2. Select the *Select All* option from the *Edit* pull-down menu. The entire document is highlighted to indicate that it has been selected and may be cut or copied.

3.8.9.3 TOPIC Main Menu—View Entry

The TOPIC *View* pull-down menu provides options for altering the appearance of the TOPIC query and query results windows. When *View* entry is selected in the *TOPIC Main Menu*, the *View* pull-down menu appears (Figure 3-28). The *View* pull-down menu contains the following entries:

Expand Selection—Expand the node for the selected topic, assists item, results folder, or group to show more detail

Collapse Selection—Collapse the node for the selected topic, assists item, results folder, or group to show less detail

Sort—Select sorting criteria to be used in sequencing the query results list.

Tree—Change the layout of the topic query to a tree format

Outline—Change the layout of the topic query to an outline format

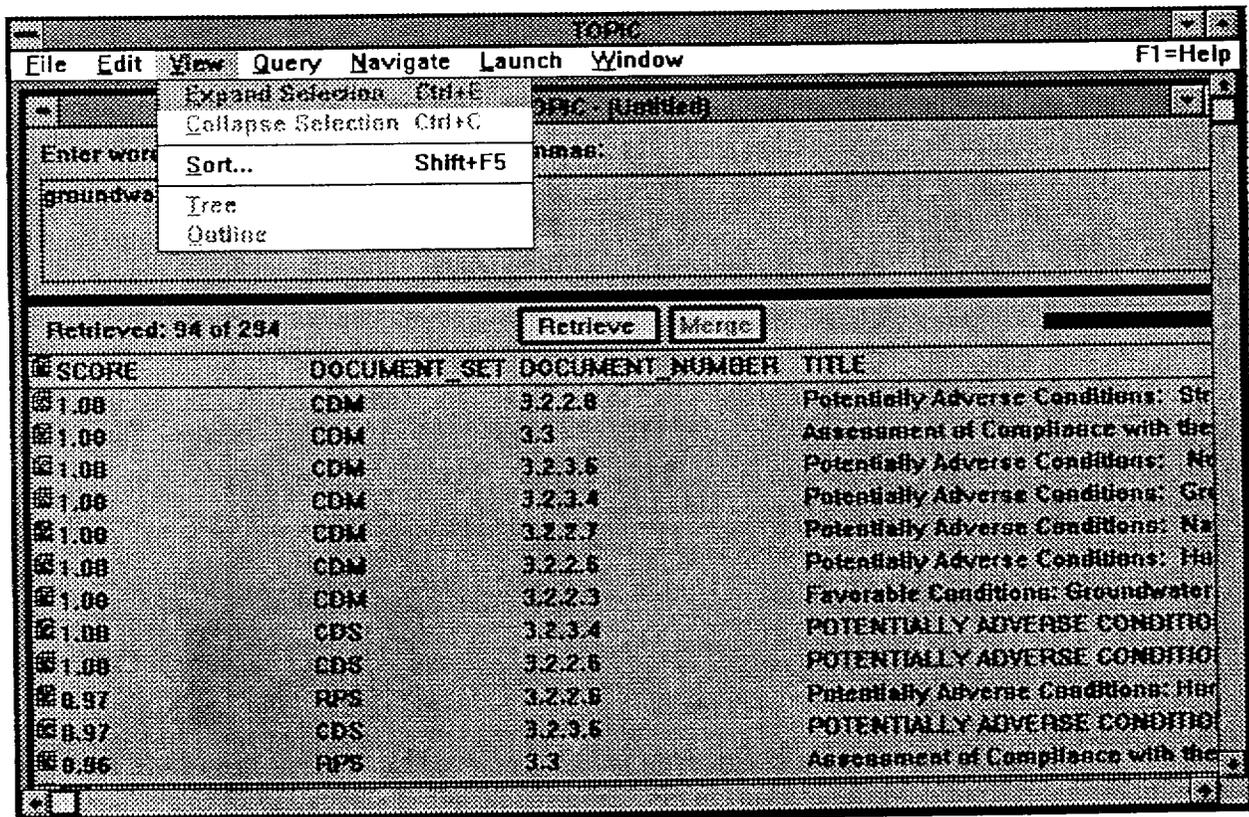


Figure 3-28. TOPIC View pull-down menu

The *View* pull-down menu is illustrated in Figure 3-28. Those TOPIC options that are most commonly used in the CDOCS are described below.

TOPIC View Pull-down Menu—Sort Entry

A default sequence is defined for the query results lists. However, the results list sequence may be altered by selecting the *Sort* option from the *View* pull-down menu.

To change the *Sort* sequence for the query results list:

1. Select the *View* entry from the *TOPIC Main Menu*. The *View* pull-down menu appears (Figure 3-28).
2. Select the *Sort* entry from the *View* pull-down menu. A *Sort Specification* window appears (Figure 3-29).
3. Select the *Ascending* or *Descending* radio button to specify ascending or descending sequence for the sort.

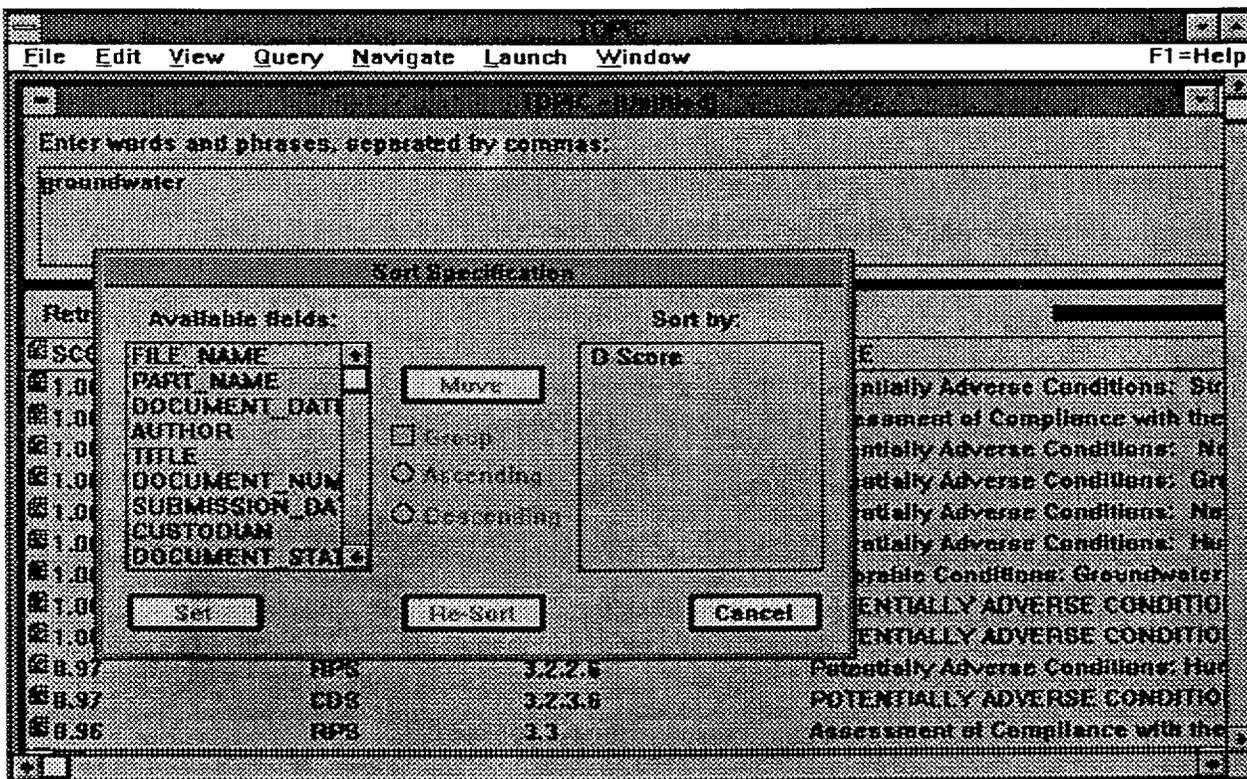


Figure 3-29. TOPIC Sort Specification screen

4. Double clicking fields in the *Sort by* group box removes them from the sort. Another method is to: (i) highlight the field in the *Sort by* box that is to be removed, and (ii) click the *Move* button.
5. Double clicking fields in the *Available fields* group box adds them to the sort. Another method is to: (i) highlight the field in the *Available fields* box that is to be added, and (ii) click the *Move* button.
6. Select the *Set* push-button to save the new sort sequence.
7. Select the *Re-Sort* push-button to apply the new sort sequence to the current results list.
8. Select the *Cancel* push-button to discard the changes to the sort sequence.

3.8.9.4 TOPIC Main Menu—Query Entry

The TOPIC *Query* pull-down menu provides a method of altering various options associated with TOPIC queries. When the *Query* entry in the *TOPIC Main Menu* is selected, the *Query* pull-down menu appears (Figure 3-13).

The *Query* pull-down menu contains the following entries:

Start Retrieval—Start a query retrieval based on the current query defined in the query window

Cancel Retrieval—Cancel the current query retrieval

Merge Results—Merge the results of a retrieval when results have been obtained from multiple partitions

Assists—Open the *Assists* window to display topics, words, and stems contained in the TOPIC database

Add Operator—Add an operator in a topic query

Add Child—Add a branch topic or a leaf topic to a selected parent.

Add Sibling—Add a branch topic or a leaf topic as a sibling to a selected topic

Simple Query—Conduct a simple query

Form Query—Conduct a form query

Topic Query—Conduct a topic query

Query Options—Specify options for the query

Choose Sources—Select a source or set of sources to be used in retrievals

The *Query* pull-down menu is illustrated in Figure 3-13. Those TOPIC options that are most commonly used in the CDOCS are described below.

TOPIC Query Pull-down Menu—Assists Entry

TOPIC includes a number of tools for assisting in formulating queries. These may be accessed through the *Assists* entry in the *Query* pull-down menu.

To access the *Assists* window:

1. Select the *Query* entry from the *TOPIC Main Menu*. The *Query* pull-down menu appears (Figure 3-13).
2. Select the *Assists* entry from the *Query* pull-down menu. An *Assists* window appears (Figure 3-30).
3. Select the desired *Assists* entry from the list in the *Assists Window*. See the *TOPIC User's Guide* for more information on this option.
4. Click outside of the *Assists* window to close it.

TOPIC Query Pull-down Menu—Simple Query, Form Query, Topic Query

TOPIC provides facilities for three types of queries: (i) simple queries, (ii) form queries, and (iii) topic queries. The type of query selected determines the appearance and format of the query entry window. The desired type of query may be selected through the *Query* pull-down menu.

To select the type of query:

1. Select the *Query* entry from the *TOPIC Main Menu*. The *Query* pull-down menu appears (Figure 3-13).
2. Select the query type from the *Query* pull-down menu.

Instructions for entering simple queries and form queries may be found in Section 3.8.2 and Section 3.8.3.

TOPIC Query Pull-down Menu—Query Options Entry

TOPIC provides facilities for associating various options with queries. The query options may be selected through the *Query Options* entry in the *Query* pull-down menu.

To select the query options:

1. Select the *Query* entry from the *TOPIC Main Menu*. The *Query* pull-down menu appears (Figure 3-13).

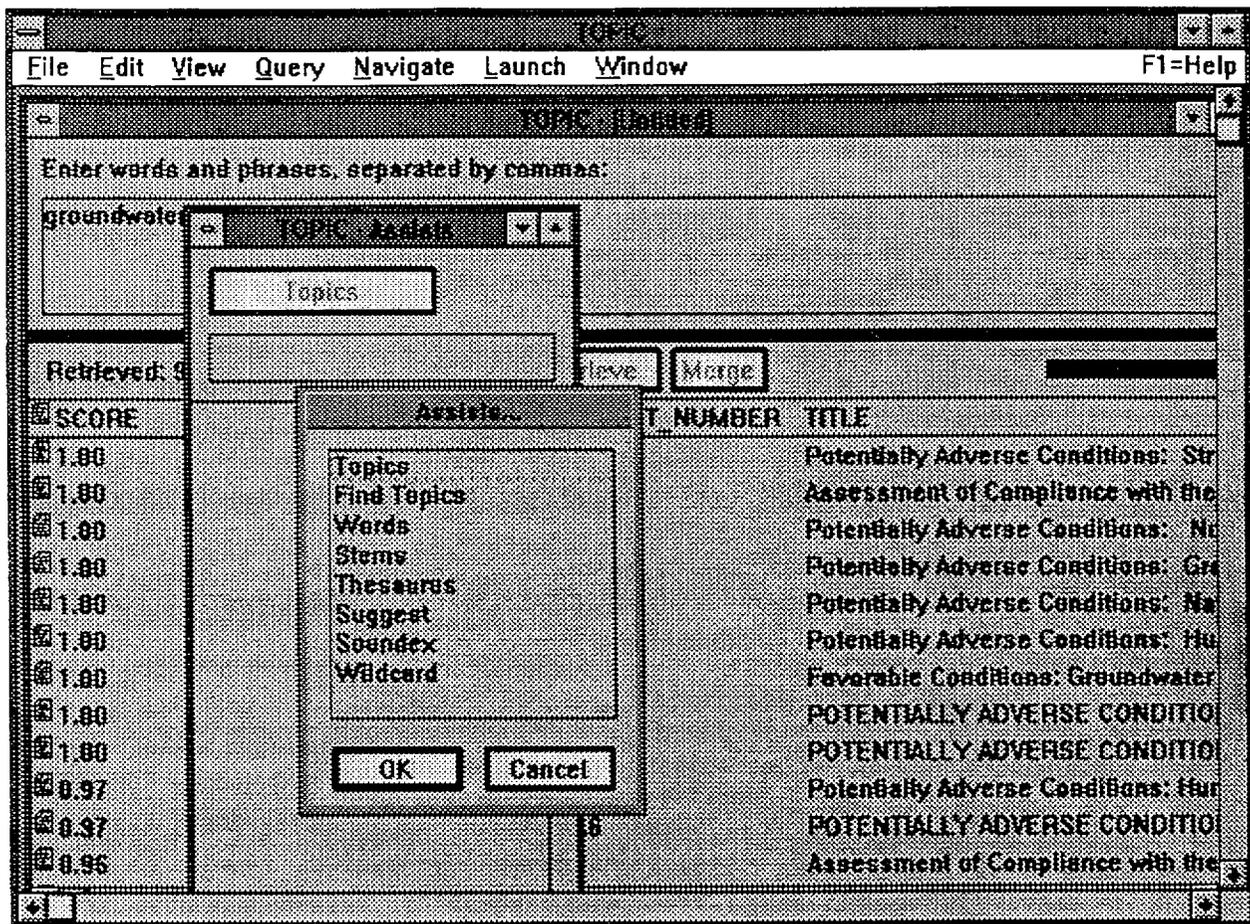


Figure 3-30. TOPIC Assists pull-down menu

2. Select the *Query Options* entry from the *Query* pull-down menu. A *Query Options* window appears (Figure 3-31).
3. Select and/or enter the desired query options in this window.
4. Select the *OK* push-button to close the *Query Options* window and save the options that have been entered and/or selected.
5. Select the *Cancel* push-button to close the *Query Options* window and discard the options that have been entered and/or selected.

TOPIC Query Pull-down Menu—Choose Sources Entry

TOPIC provides facilities for limiting the scope of query searches to selected sets of documents. These selected sets of documents are called “sources.” By selecting one or more particular sources, the

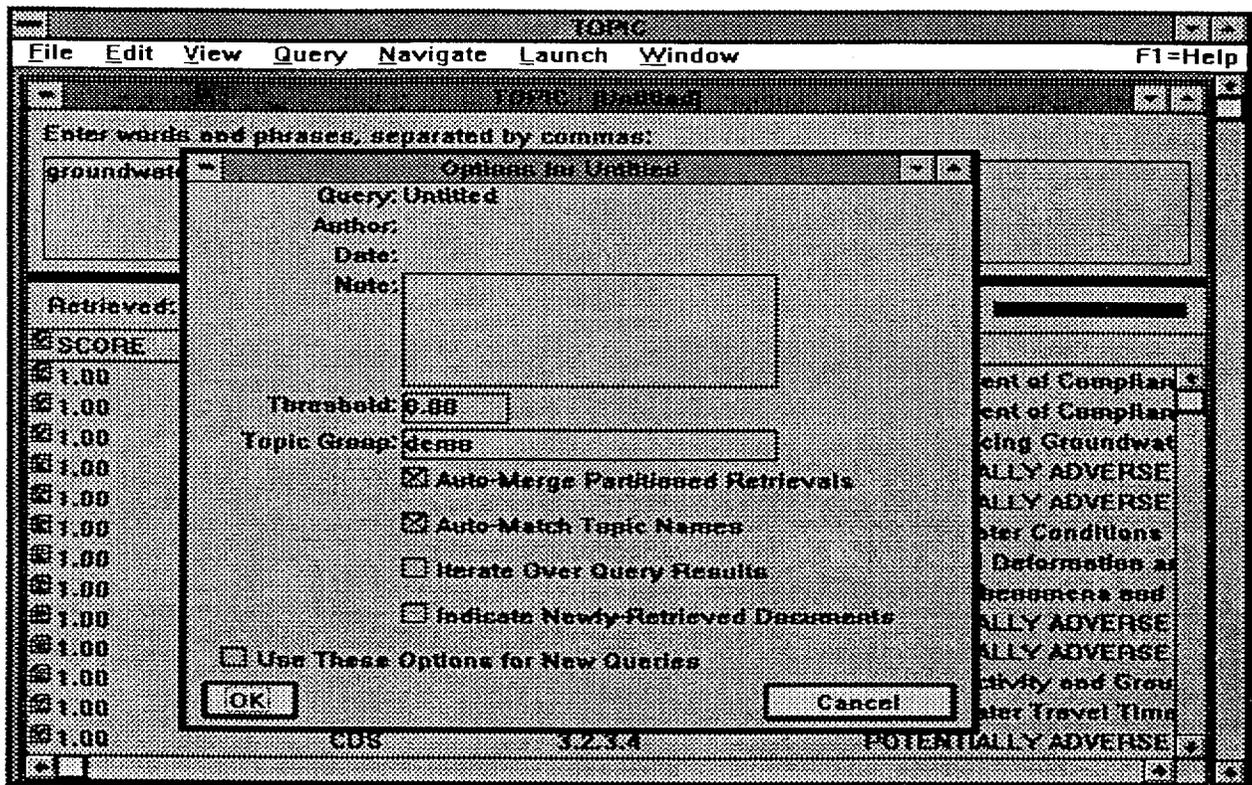


Figure 3-31. TOPIC Query Options window

number of documents searched may be limited and reduce the occurrences of unwanted documents from extraneous sources in the search results list.

To select one or more sources:

1. Select the *Query* entry from the *TOPIC Main Menu*. The *Query* pull-down menu appears (Figure 3-13).
2. Select the *Choose Sources* entry from the *Query* pull-down menu. A *Source Selection* screen appears (Figure 3-32).
3. Select one or more sources by clicking the entries in this window. Selected entries are highlighted.
4. Select the *OK* push-button to close the *Source Selection* window and save the selected sources.
5. Select the *Cancel* push-button to close the *Source Selection* window and discard the selected sources.

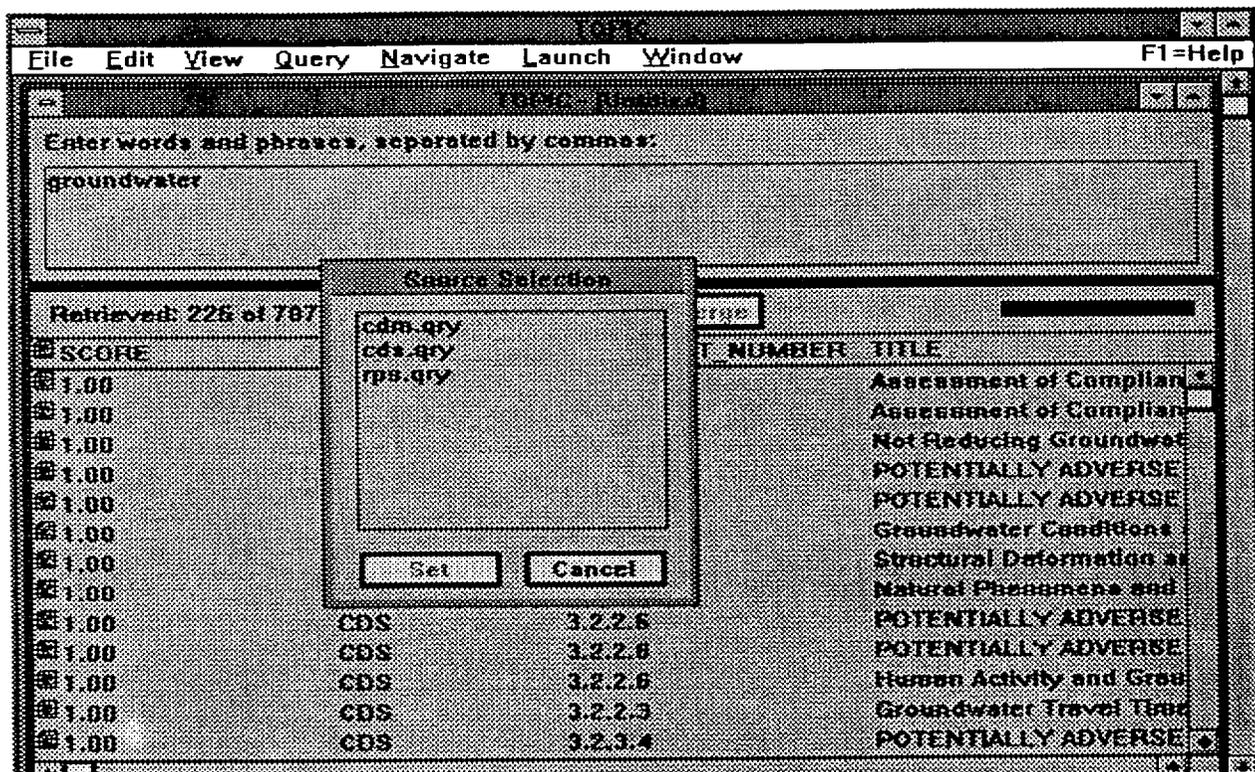


Figure 3-32. TOPIC Source Selection screen

3.8.9.5 TOPIC Main Menu—Launch Entry

The TOPIC *Launch* pull-down menu provides options for starting other programs and functions from TOPIC. When the *Launch* entry in the *TOPIC Main Menu* is selected, the *Launch* pull-down menu appears (Figure 3-33). The *Launch* pull-down menu contains the following entries:

Import from File—Import a named file of retrieval results and display them in a query window

Export to File—Export the current retrieval results to a named file

Export Topic to File (User Modifications)—Export the modifications that have been made to a topic to a named file

Export Topic to File (Full Definition)—Export the full definition of a topic to a named file

WordPerfect 5.1—Start WordPerfect 5.1

Write Results to File

Only the *WordPerfect 5.1* option is described below

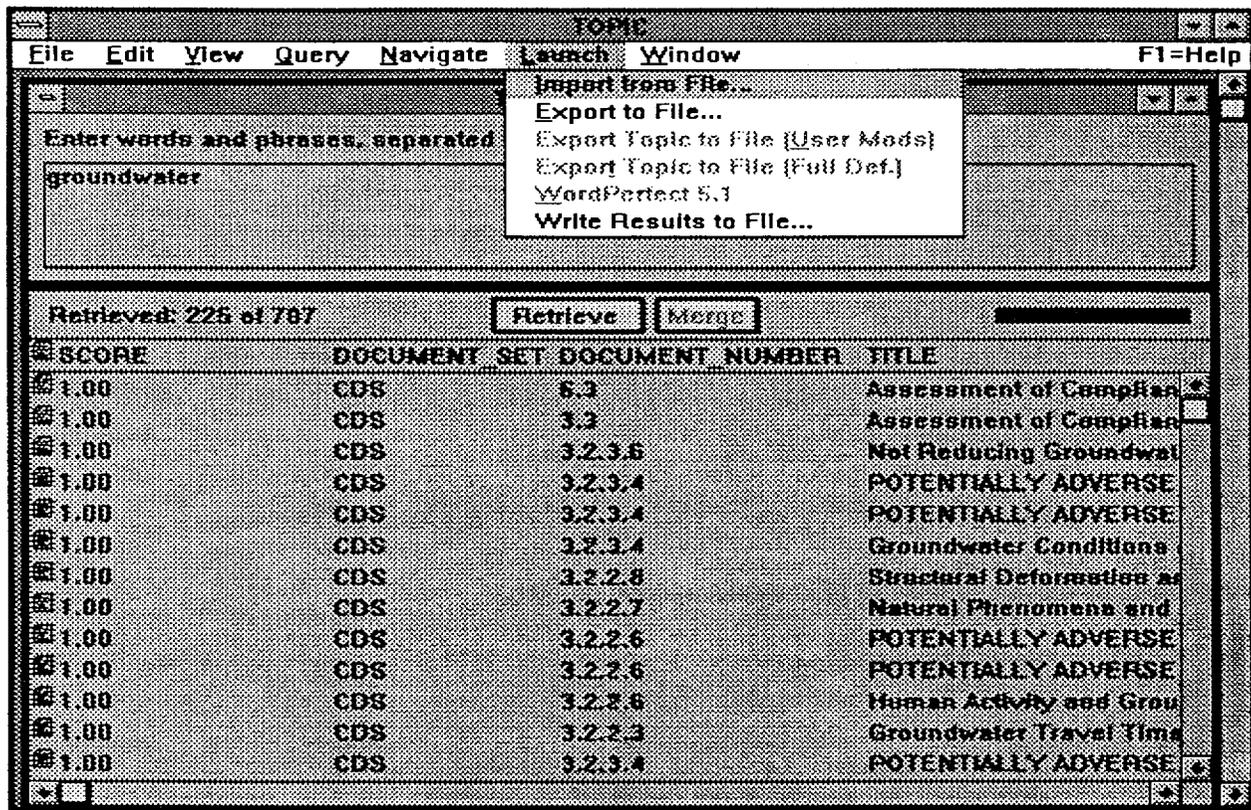


Figure 3-33. TOPIC Launch pull-down menu

TOPIC Launch Pull-down Menu—WordPerfect 5.1 Entry

TOPIC provides facilities for starting WordPerfect, using a file selected from the TOPIC full-text repository.

To start WordPerfect:

1. Select the *Launch* entry from the *TOPIC Main Menu*. The *Launch* pull-down menu appears (Figure 3-33).
2. Select the *WordPerfect 5.1* entry from the *Launch* pull-down menu. WordPerfect is started.

3.9 MAIN MENU—REPORT ENTRY

The availability of reports depends on the users authorities and permissions. Reports that are authorized for viewing will appear on the *Report* pull-down menu. Figure 3-34 illustrates the report pull-down menu.

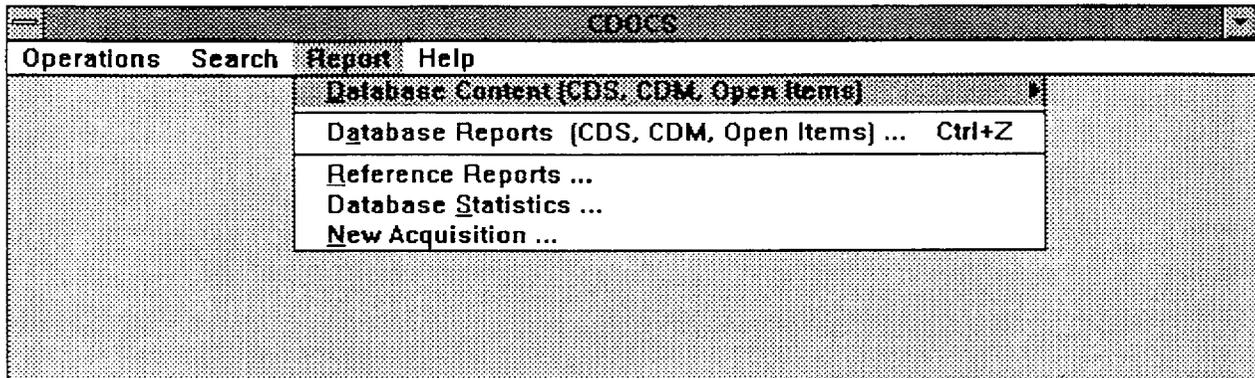


Figure 3-34. Report pull-down menu

3.9.1 Selecting, Displaying, and Printing Database Content Reports

To select, display, and print a database content report:

1. Select *Report* from the menu bar of the *CDOCS Main Menu* (Figure 3-4). The *Report* pull-down menu will appear (Figure 3-34).
2. Select the *Database Content* entry from the *Report* pull-down menu. A cascading menu will appear that includes the names of the Regulatory Records reports in the Database Content group that are available to you.
3. Select the desired report from the *Database Content* reports cascading menu. The report will be prepared and displayed on your screen (Figure 3-35). The report display screen may be scrolled in both the horizontal and vertical directions. To view any portions of the report that are not visible, position your cursor over the appropriate scroll bar, press the mouse button, and move the indicator until the desired information appears in the *Regulatory Records Status Report Display* screen.
4. If you want printed output, select the *Print* push-button at the bottom of the *Regulatory Records Status Report Display* screen. The report display will be formatted and routed to a printer.
5. When you have finished viewing and/or printing the report, you may close the *Regulatory Records Status Report Display* screen by selecting the *Close* push-button at the bottom of the screen.
6. If you need assistance displaying or printing reports, you can select the *Help* push-button at the bottom of the *Regulatory Records Status Report Display* screen to display additional information.

REGULATORY PROGRAM RECORD STATUS REPORT AS OF 09 JAN 1995

REV PLAN	TITLE OF DOCUMENT	TYPE	VERSION	DATE
1.1	General Description of the Facility	CDM	0.0	01 JUL 94 VA
1.1	GENERAL DESCRIPTION OF THE FACILITY	CDS	0.2	01 JUL 94 AC
1.1	General Description of the Facility	RPS	0.0	06 JUL 94 AC
1.2	Basis for Licensing Authority	CDM	0.0	01 JUL 94 VA
1.2	BASIS FOR LICENSING AUTHORITY	CDS	0.2	01 JUL 94 AC
1.2	Basis for Licensing Authority	RPS	0.0	06 JUL 94 AC
1.3	Schedules	CDM	0.0	01 JUL 94 VA
1.3	SCHEDULES	CDS	0.2	01 JUL 94 AC
1.3	Schedules	RPS	0.0	06 JUL 94 AC

Figure 3-35. Regulatory Records Status Report

3.9.2 Selecting, Displaying, and Printing Database Reports

Production of database reports is supported by the generalized report writer. This facility permits selection of a wide variety of information and report formatting. Once the information has been extracted from the database, it is formatted according to the selected report specifications and presented as a WordPerfect document. You may then view the WordPerfect document, print it, edit it, save it, or incorporate it into other work products. You cannot save an assembled or edited database report document back to the CDOCS database.

To select a database report:

1. Select the *Report* entry in the menu bar of the *CDOCS Main Menu* (Figure 3-4). The system will display The *CDOCS Reports* pull-down menu (Figure 3-34).
2. Select *Database Reports* from the *Report* pull-down menu. Alternatively, you may press the accelerator key [^z]. The *Database Reports Selection List* screen (Figure 3-36) will

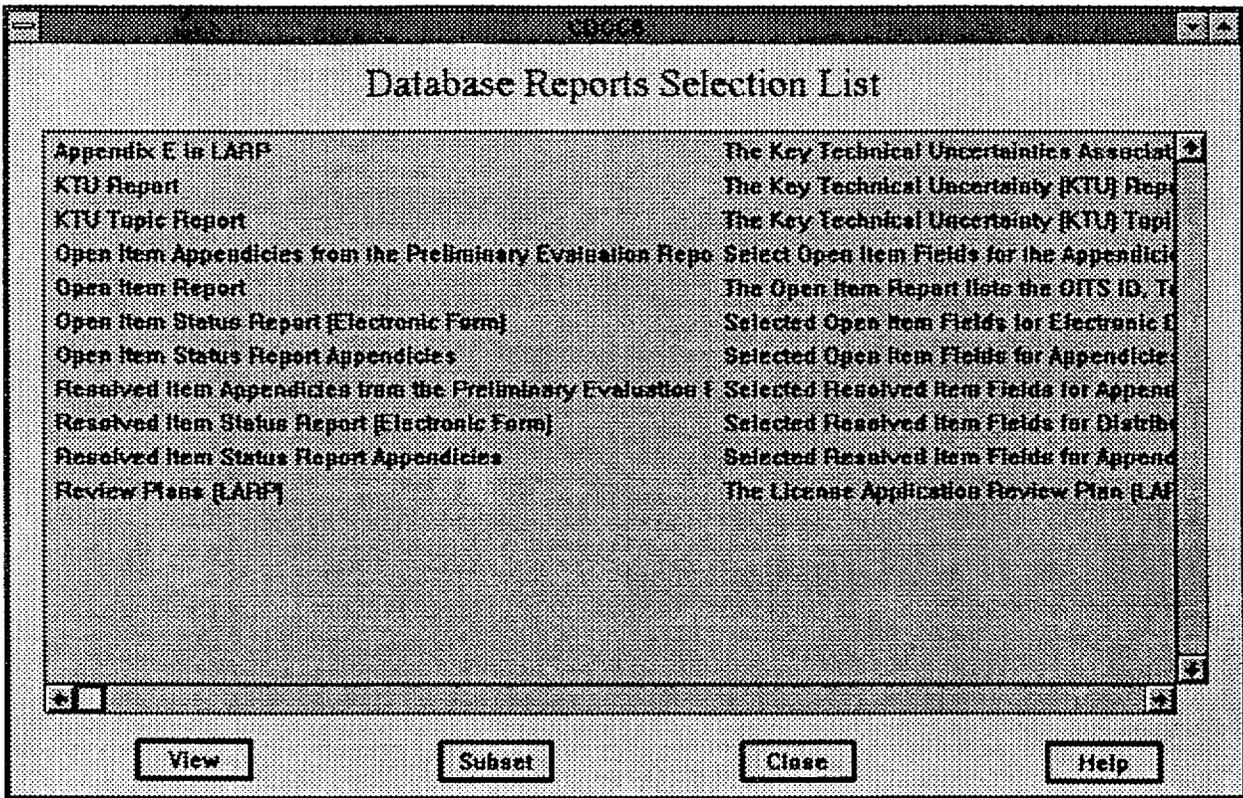


Figure 3-36. Database Reports Selection List

appear that includes a list view with the names of all database reports that are available to you.

3. Select the desired report from the list of available database reports and click the *View* push-button at the bottom of the screen. The system will format the requested report as a WordPerfect document and start the WordPerfect software.

Once the report has been formatted as a WordPerfect document, you may use the normal facilities of WordPerfect to view the document, edit it, print it, or save it. However, if you want to save the document, you must do so on a diskette or the local hard disk. You will not be permitted to save a database report document in CDOCS.

4. To exit from the *Database Reports Selection List* screen, select the *Close* push-button at the bottom of the screen.
5. If you need assistance in accessing database reports, select the *Help* push-button at the bottom of the *Database Reports Selection List* screen.

3.9.3 Report Menu—Reference Report

The *Reference Report* contains listings of two NRC bibliographic databases: the NIST Citations and Hydrologic Database References. To display and print a *CDOCS Reference Report*:

1. Select the *Report* entry in the *CDOCS Main Menu* (Figure 3-4). The *CDOCS Report* pull-down menu appears (Figure 3-34).
2. Select the *Reference Reports* entry from the *CDOCS Report* pull-down menu. A list of available reference reports is displayed.
3. Select the desired report from the list of reference reports. The selected report is displayed.
4. Select the *Print* push button to print the report.

3.9.4 Report Menu—Database Statistics

The *Database Statistics Report* contains summary listings of the content of CDOCS by numbers of type of document and month/year of submittal. To display and print the *CDOCS Database Statistics Report*:

1. Select the *Report* entry in the *CDOCS Main Menu* (Figure 3-4). The *CDOCS Report* pull-down menu appears (Figure 3-34).
2. Select the *Database Statistics* entry from the *CDOCS Report* pull-down menu. The database statistics report is displayed.
3. Select the *Print* push button to print the report.

3.9.5 Report Menu—New Acquisitions Report

The *CDOCS New Acquisitions Report* is designed to assist in tracking new acquisitions in the CDOCS system. The new acquisitions report is accessed through the *CDOCS New Acquisitions Report* selection screen (Figure 3-37).

To use the *CDOCS New Acquisitions Report*:

1. Select *Report* from the *Main Menu* (Figure 3-4). The *Report* pull-down menu is displayed (Figure 3-34).
2. Select *New Acquisitions* from the *Report* pull-down menu. The *CDOCS New Acquisitions Report* selection screen is displayed (Figure 3-37).

If the correct document set is not indicated in the *Document Set* drop-down list, select the drop-down indicator to display a list of available document sets and select the desired entry.

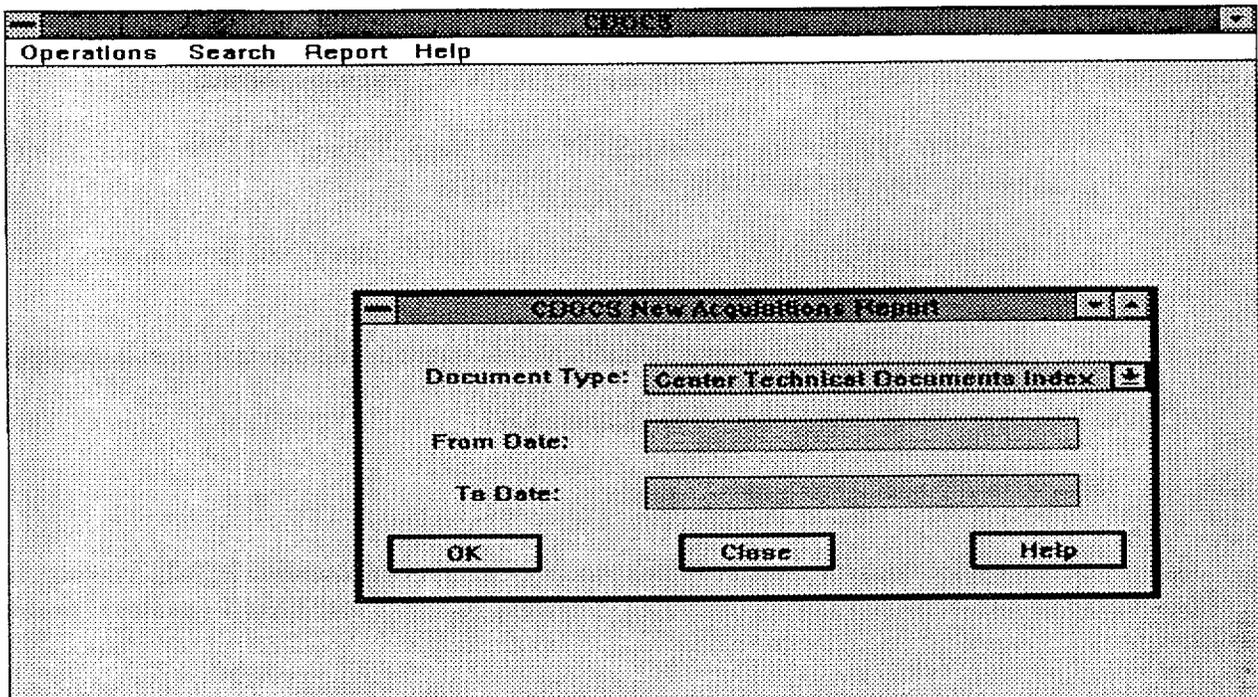


Figure 3-37. New Acquisitions Report selection screen

4. Enter the beginning date for the reporting period in the *From Date* entry field (Figure 3-38).
5. Enter the ending date for the reporting period in the *To Date* entry field.
6. Select the *OK* push-button to execute the report. The New Acquisitions Report screen is displayed (Figure 3-39).
7. Select the *Print* push-button to print the report, if desired.
8. Select the *Close* push-button to exit from the *CDOCS New Acquisition Report* selection screen.

3.10 MAIN MENU—HELP ENTRY

CDOCS provides on-line help that is configured to reflect the individual user's authorities and permissions.

To access the on-line Help from the *CDOCS Main Menu*:

1. Select *Help* from the menu bar of the *CDOCS Main Menu* (Figure 3-4). A *Help* pull-down menu appears with entries for *Help* and *About* (Figure 3-40).

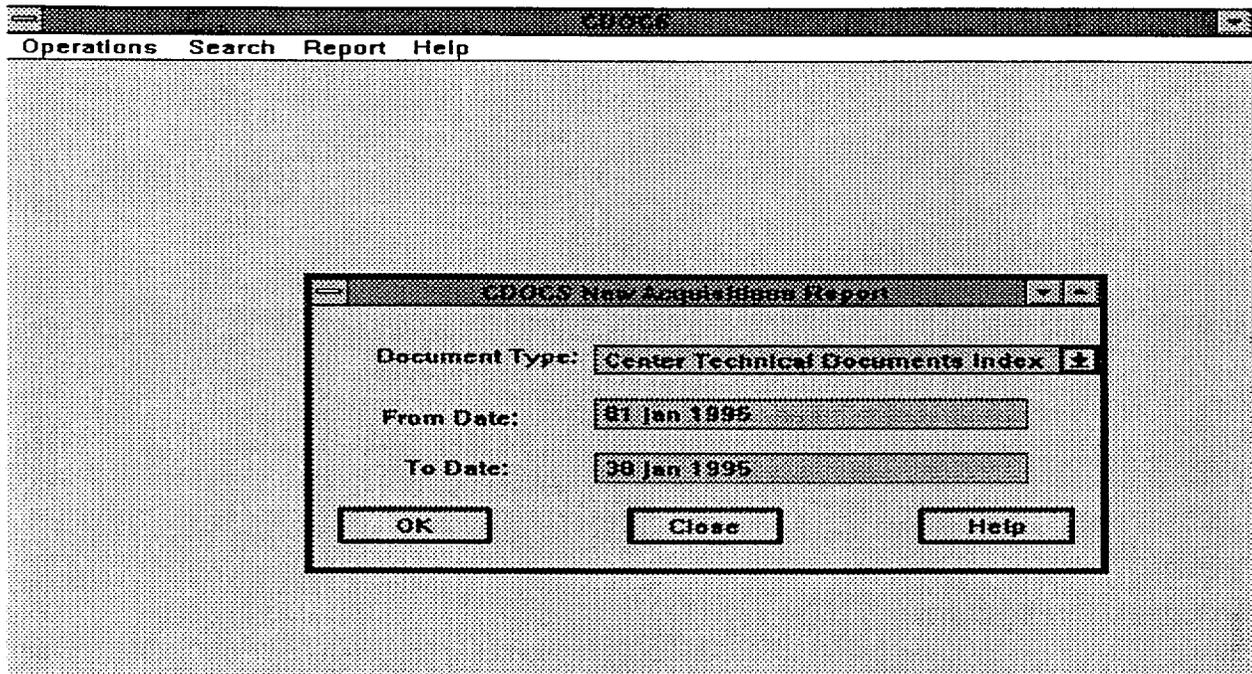


Figure 3-38. New Acquisitions Report selection example

2. Select *Help*, or press the mnemonic key [h] or the accelerator key [Ctrl+H], a screen appears that provides information about how to use the Help facility.
3. Select the *About* entry, or press the mnemonic key [a], a description of the CDOCS is displayed.

To use the *Help* entry in the *Help* pull-down menu:

1. Select the *Help* entry from the *Help* pull-down menu (Figure 3-40). The *Help Index* window is displayed (Figure 3-41).
2. Select the desired entry from the *Help Index* window to display the help topics for that entry (Figure 3-42).

Similar help functions are available from all other CDOCS and TOPIC search screens.

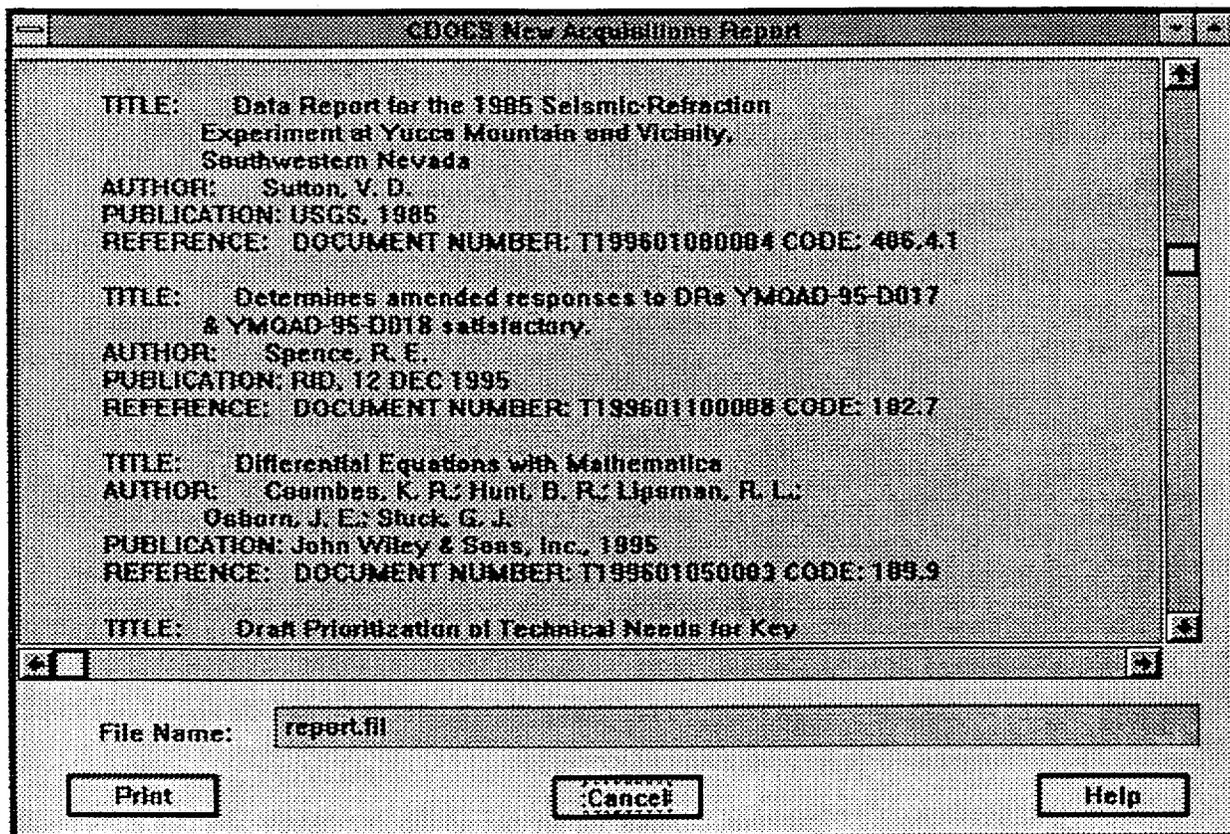


Figure 3-39. New Acquisitions Report screen

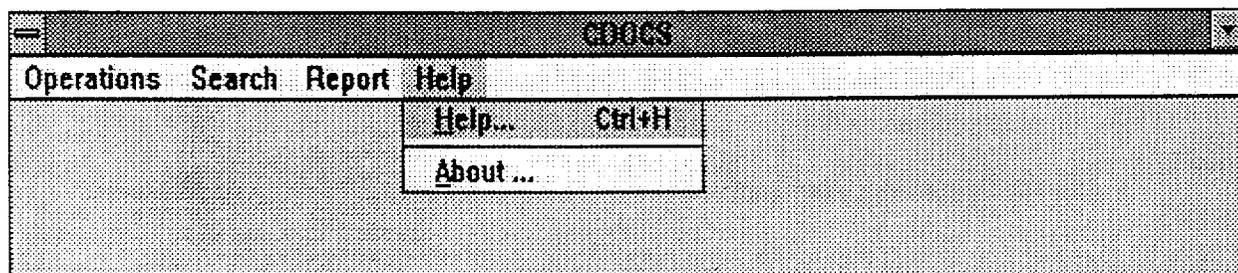


Figure 3-40. CDOCS Help pull-down menu

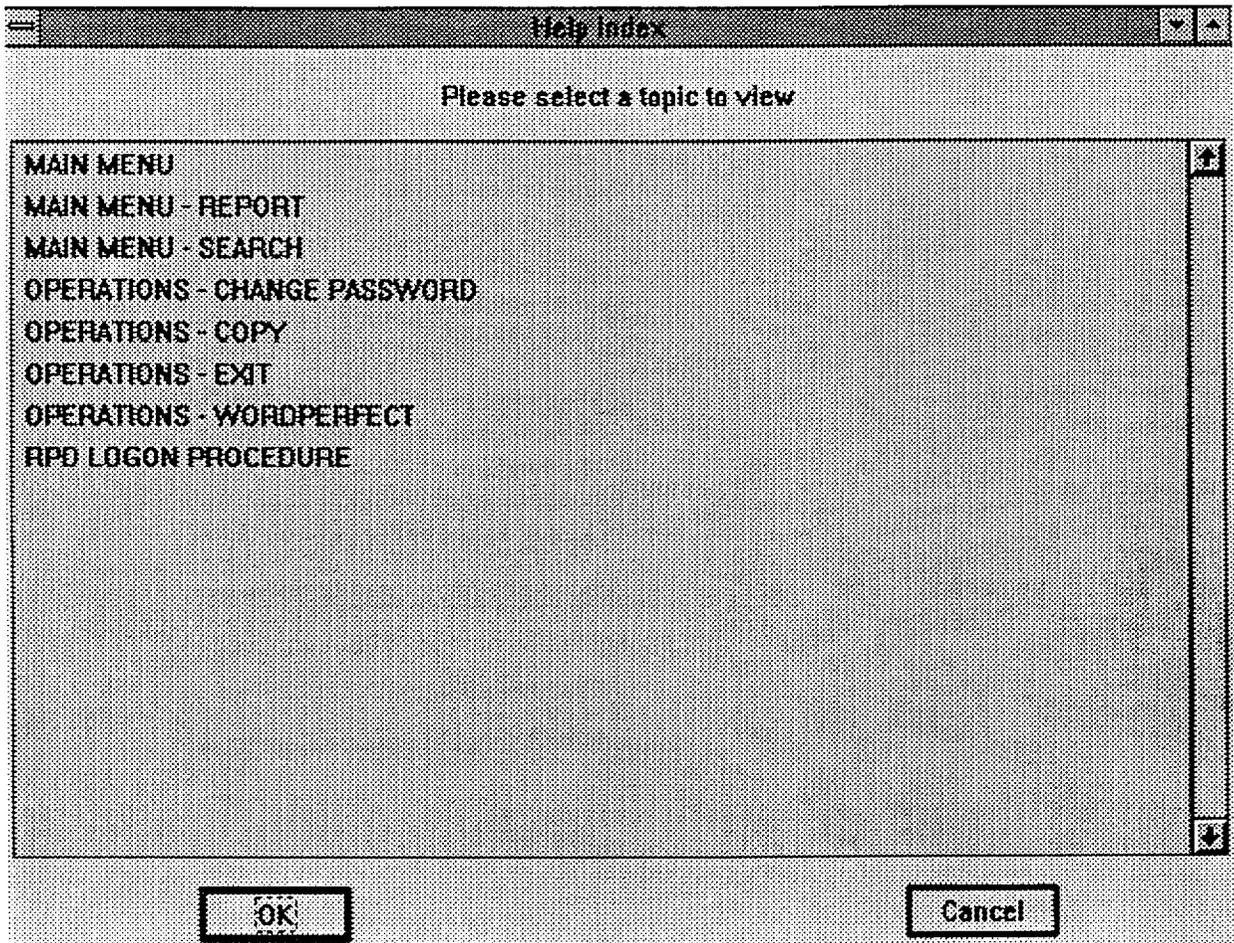


Figure 3-41. CDOCS Help Index

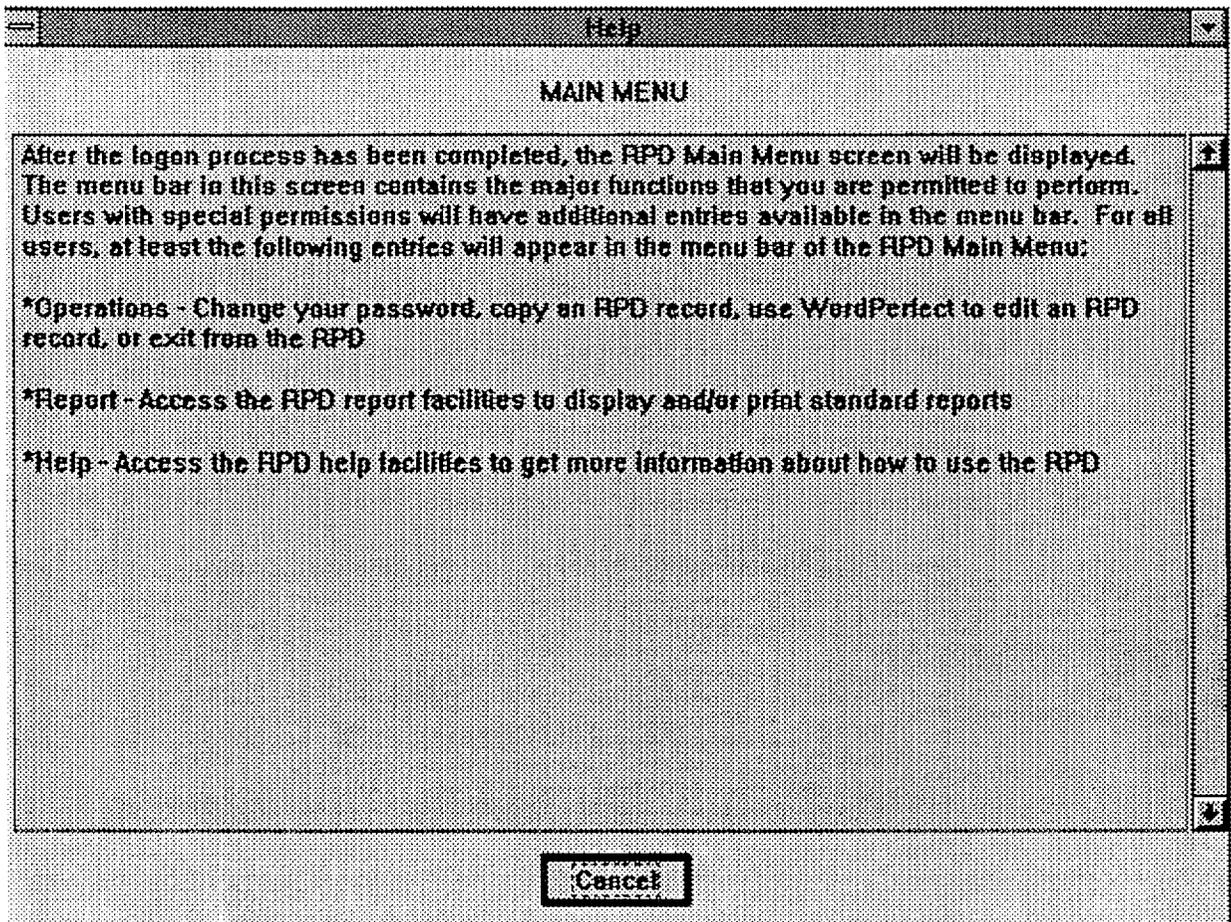


Figure 3-42. CDOCS help screen

4 SCANNING GUIDELINES

4.1 INTRODUCTION

Scanning is the process through which hard-copy documents are captured in electronic form. The document pages submitted for scanning may include text, images, or both text and images. In the scanning step, the hard-copy pages are scanned to capture an electronic image. Then the electronic image is processed for character recognition [also known as optical character recognition (OCR)]. During the OCR process, the digital image of each scanned page is analyzed and manipulated by software to recognize individual text characters and arrange them into words, sentences, paragraphs, etc. Some portions of the digital image of a page may contain nontextual features that cannot be processed for OCR. Other portions may contain specialized text, such as tables of numbers. A process called zoning permits these specialized nontextual portions of the image to be identified so that the OCR software can interpret or process them in an appropriate way.

Scanning and OCR are imperfect processes whose accuracy may be affected adversely by a number of factors. Therefore, scanning, zoning, and OCR are normally followed by a document cleanup step in which the text produced by the OCR process is reviewed and edited manually to correct scanning and OCR errors.

Figure 4-42 illustrates the data flow and relationships between the scanning, zoning, OCR, and document cleanup functions.

The scanning process involves several distinct steps:

- The document is examined to determine if exception conditions must be accommodated.
- A user-supplied document name is entered and options for text and full-page images are selected.
- The pages are placed in the document feeder or on the scanner bed and scanned.
- Page images are zoned as required to designate areas of text versus areas of graphical images.
- Pages of text are accessed through a special editor to correct scanning/OCR errors.
- The corrected text is exported to the file system along with any associated images as a collection of related files for loading into the full-text and image repositories or for individual use.

4.2 OVERVIEW OF DOCUMENT SCANNING FOR SUBMISSION TO THE CONSOLIDATED DOCUMENT MANAGEMENT SYSTEM

For the purpose of this discussion, we will assume the document to be submitted to CDOCS is a single-page document. Every document page submitted to CDOCS must at minimum consist of a full page *image*. Other scanned information may be required, depending on the format of the document being submitted.

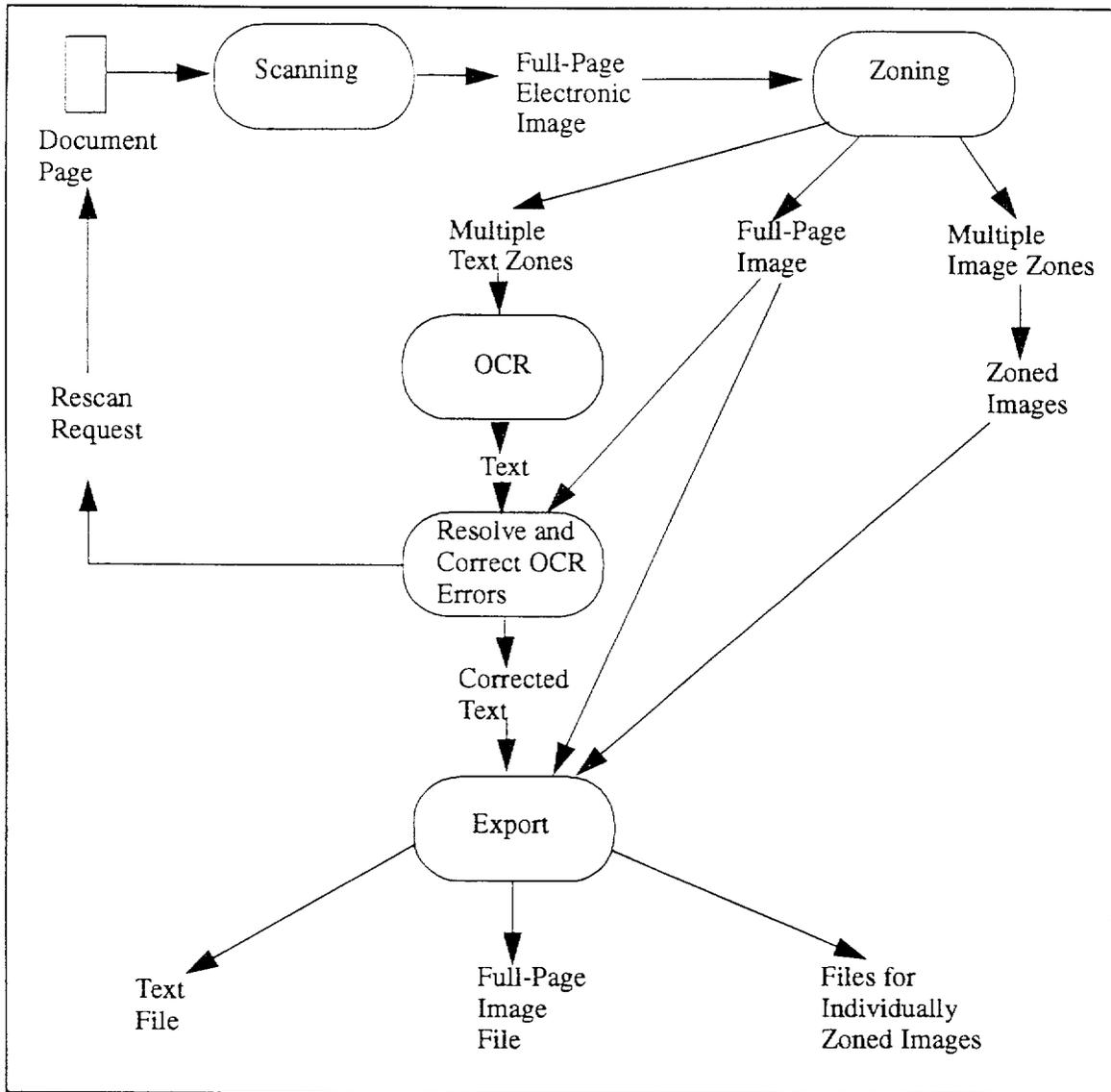


Figure 4-1. Scanning data flow

4.2.1 Single-Page Document with Only Plain Text

Two scanner generated files are required:

- An image file of the full page
- An ASCII file of the scanned and OCR processed text
- A WordPerfect file generated from the ASCII file

Depending on the layout of the page (single column text, multiple column text, footnotes, etc.) multiple zones may need to be defined and linked in the appropriate order to create a correct ASCII file

of the text. Zoning is discussed in greater detail in Section 4.4 and in Appendices C and D which discuss the use of two different scanning application programs.

4.2.2 Single-Page Document with Text and Images

Three types of files may be required:

- An image file of the full page is always required.
- An ASCII file of the scanned and OCR processed text, including all pages, is always required.
- A WordPerfect file generated from the ASCII file.
- Additional image files may be created for each individually zoned image on the page.

4.3 FACTORS AFFECTING THE QUALITY OF SCANNING AND OPTICAL CHARACTER RECOGNITION

A number of factors, including the quality of printing, the alignment of the document in the scanner, the presence of folds or creases, can introduce distortion and cause the OCR process to misinterpret the scanned image. The following sections identify several of the common factors affecting the quality of scanning and OCR. Approaches to minimizing the impact of these factors on the scanning and OCR processes are discussed.

4.3.1 Skewed Document Scanning

Scanning occurs in a predictable sequence, from the top to the bottom of the page, and from the left to the right of each line. The top edge of the page serves as a reference for the scanning process and the image is assumed to be either parallel or perpendicular to this edge. When the scanned image is processed for OCR, the software also assumes reasonable alignment of the text with the top edge of the physical page. If the document is slightly skewed, individual lines of text may be broken into multiple lines. If the document is skewed excessively, the OCR process may produce unusable text because the skew may interfere with the recognition of individual characters. Therefore, it is important to avoid skewed document scanning because improper alignment of the document can have an adverse effect on the OCR error rate.

If the scanner document feeder is being used, particular care should be given to positioning the document guides on the input tray. The document guides should be positioned firmly against the edges of the document stack and the documents should be positioned firmly against the feed mechanism. If the bed of the scanner is being used, particular care should be exercised in placing the document on the scanner bed to avoid skewed scanning and subsequent OCR errors.

4.3.2 Orientation of the Document Pages

It is important for the document to be properly oriented in the feeder or on the scanner bed. If a document is upside down or rotated from its expected orientation, the OCR software will have difficulty interpreting the image. Therefore, unusual orientations of document pages must be adjusted by rotating the image electronically before OCR processing is attempted. The scanning software has capabilities for

rotating images after scanning, but use of these capabilities requires manual intervention. Therefore, whenever possible, it is easier and preferable to orient the pages correctly before scanning begins.

4.3.3 Interleaved Portrait and Landscaped Pages

Most pages are printed in a "portrait" orientation where the text is aligned with the short axis of the paper. Other pages may be printed in a "landscape" orientation where the text is aligned with the long axis of the paper. In order to properly interpret the image, options must be selected that permit the OCR software to anticipate the page orientation as either portrait or landscape. However, some documents contain both portrait and landscape pages. When scanning such documents, it is necessary to select the predominate orientation for the entire document and then treat pages with different orientations as exceptions.

If pages with portrait and landscape orientations are interleaved, the primary orientation is selected for the entire document, and image rotation facilities are used after scanning to adjust the orientation of exception pages before the OCR process is started for those pages. The ability to rotate the image is part of the zoning process. Therefore, if a document contains interleaved portrait and landscape pages, zoning should be deferred to permit individual adjustment of the orientation of exception pages. An alternative approach is to scan all pages in the document as if they had the predominant orientation (e.g., landscape or portrait), and then re-scan, or electronically rotate, any pages found with exception orientations.

4.3.4 Scanning Bound Documents

If the document is bound, it must be scanned using the bed of the scanning device. When scanning bound documents it is important that each page be properly positioned and aligned with the scanner to avoid skewed scanning. Bound documents present an additional problem. The scanner bed is flat, but the pages of a bound document are not necessarily flat because the binding causes pages to bend upward away from the scanner bed at the bound margin. This results in distortion of the image along the bound edge of the page that can degrade the OCR process. Therefore, it is very important to press bound documents firmly against the glass of the scanner bed to flatten the pages as they are scanned. If the document is excessively skewed or if the pages are not flat, the scanned image may be too distorted to permit effective OCR processing.

4.3.5 White Space

Empty space surrounds individual characters and separates lines, paragraphs, and columns. This empty space is known as "white space." Proper interpretation of digital images by the OCR software requires consistent white space. A very small amount of white space is required to distinguish adjacent characters. More white space is required to distinguish adjacent words. White space is also required between lines to distinguish the text on one line from text on the following line. Additional white space is required to distinguish multiple columns on a page.

Many factors, including distorted characters, extraneous marks, unusual printing layout or format, etc., can interfere with the interpretation of white space and cause the OCR process to produce unsatisfactory results. There is little that can be done to compensate for insufficient white space between characters or lines. Documents with such printing problems produce large numbers of OCR errors that must be corrected manually during the document cleanup process.

Document pages that are printed in multiple columns may also present OCR problems if the white space between the columns is not sufficient or is not consistent. The OCR software must distinguish between the spaces separating words and the spaces separating columns. If the white space between columns is wider than the white space between words and is consistent in its placement and width, the columns will be detected and interpreted correctly. However, if the white space between columns is too small, the OCR software may interpret it as spaces between words on lines that span the entire width of the page. This causes corresponding lines from the columns to be interleaved, and the resulting text is unusable. Zoning provides a solution for this problem by permitting the columns to be identified and sequenced individually.

4.3.6 Inappropriate Contrast

Black and white scanners rely on contrast to distinguish text, figures, and graphic images from white space. The underlying assumption of such hardware is that points that are dark are part of the image and points that are white are part of the white space. Unfortunately, images exist with widely varying intensities and levels of contrast. Adjustments are available to permit the hardware and software to be fine tuned to the optical characteristics of the document. However, some combinations of colors cannot be satisfactorily scanned on black and white scanners because of insufficient contrast between adjacent areas of similar colors. Also, copying (Xeroxing) of pages may result in reduced contrast. Therefore, care must be taken when scanning copied originals.

4.3.7 Poor Quality Printing

OCR is most effective when individual characters do not actually touch, because a small amount of white space is required to distinguish adjacent characters. Poor quality printing in which characters touch or are not well formed can adversely affect the OCR process. Making copies of documents distorts the individual characters because the lines that form the characters are thickened. Multigeneration reproduction, where copies are made of copies, compounds this problem and quickly distorts characters to the point where frequent OCR errors occur. After two or three generations, many characters on a copy may touch or even merge to the extent that effective OCR will not be possible. There is little that can be done to improve the OCR process for such documents. Therefore, it is important to obtain and use original copies for scanning whenever possible.

4.3.8 Dot Matrix Printing

Some computer printers form individual characters by printing a number of very closely spaced dots. Although the individual characters formed by such dot matrix printers appear to the naked eye to be well formed, the scanning and OCR processes may detect and misinterpret the white space between the individual dots that form the characters. A special dot matrix setting is available that may be used along with textual or numeric zoning to improve the accuracy of the OCR process. The dot matrix setting reduces the sensitivity of the OCR process so that characters formed by a dot matrix printer are not misinterpreted.

4.4 ZONING

Zoning is the process that permits physical areas of a document page to be identified for special processing. Once the scanning process has produced a digital image of the page, zoning permits identification of image areas for special handling by drawing boxes around them (Figure 4-2). Multiple zones may be defined for a particular page and these zones may overlap. Thus, a page containing text, footnotes, figures, and equations may be zoned to identify areas containing these different kinds of information and to specify the type of processing appropriate for each. Zoning is used to address five major functions:

- Specify the type of information
- Exclude unwanted text or nontextual information
- Clarify boundaries
- Specify the order of OCR processing
- Designate areas for special processing

4.4.1 Zoning to Specify the Type of Information

A scanned page may contain various types of information.

- Text—Most pages are primarily textual in nature. The text may be arranged in a single column, multiple columns, or in irregular areas surrounding figures, photographs, or graphs. Zoning permits the areas containing text to be identified and designated for OCR processing.
- Images—CDOCS stores full page images of each page. Therefore, the entire page is normally zoned as an image. Other image features on the page, such as figures, graphs, photographs, etc., may also be zoned as individual images.
- Text and image—A zoning option is available to designate an area as being both text and image. By zoning areas as both text and image, a digital image of the area is retained and the entire area is designated for OCR processing.

4.4.2 Zoning to Exclude Nontextual or Unwanted Information

Those areas of a digital image that are not zoned as “text” are not to be processed by the OCR software. Therefore, zoning is used prior to the OCR process to exclude portions of a document page that may cause OCR errors. If a page contains several types of information, such as equations, figures, and text, zoning is used to explicitly identify the areas of text. When this is done, the OCR process skips the nontextual areas, such as equations and figures, and only attempts to convert the areas designated as text.

Selective zoning may also be used to exclude areas of unwanted text. For example, many documents have headings on each page. The headings are textual in nature, but they do not contain useful information. Therefore, zoning is normally used to exclude page headings so that the OCR process will not insert the page headings into the main body of the text.

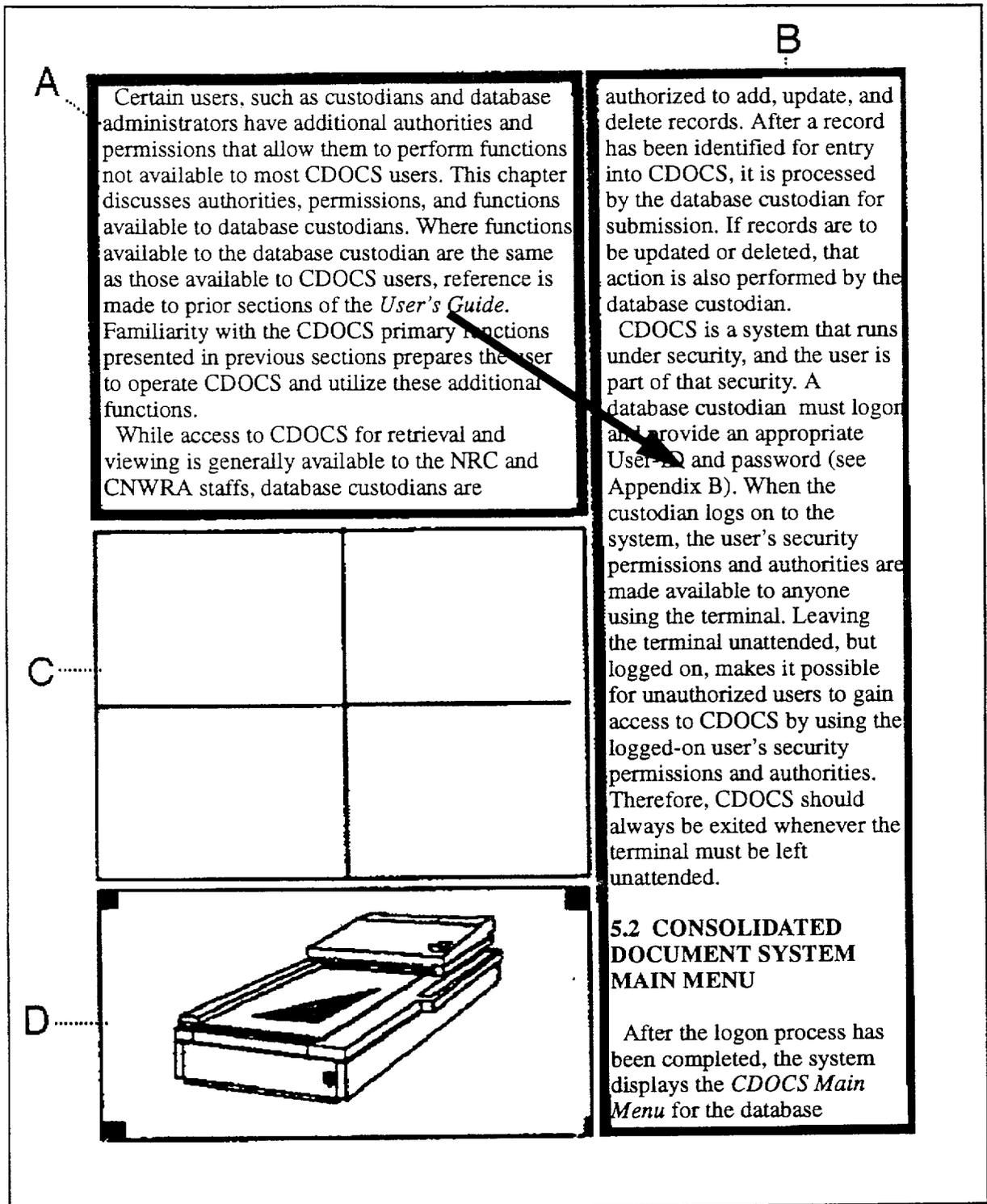


Figure 4-2. Zone examples: (A and B) Text zones linked to create a single text file (C) Ignore or exclude zone, and (D) Image zone

4.4.3 Zoning to Clarify Boundaries

As discussed in Section 4.3.5, white space is essential to permit the OCR process to distinguish characters, lines of text, paragraphs, and columns. However, in some documents the white space between columns may not be sufficient to permit the OCR software to properly interpret the image. In such cases, zoning is used to clarify boundaries so that columns are properly recognized and processed. Zoning to Specify the Order of Optical Character Recognition Processing

Zoning serves another purpose in permitting nonstandard OCR sequences to be specified. Scanning occurs in a predictable sequence, from the top to the bottom of the page and from the left to the right of each line. OCR normally follows the same sequence. Therefore, the OCR text normally reflects the sequence in which the scanning process encountered the text. However, some document pages require a different OCR sequence. For example, a page containing footnotes at the bottom of the first column would insert the text of the footnote immediately following the last word in the column. This could result in the footnote appearing out of context in the middle of a sentence or paragraph. By individually zoning columns or paragraphs, the order in which the image is processed for OCR can be specified and unusual page layouts can be easily accommodated.

4.4.4 Zoning to Designate Areas for Special Processing

Certain portions of a page may require specialized OCR processing. For example, a portion of a page might contain text produced with a dot matrix printer. Other areas might contain tables consisting entirely of numbers. In such cases, the areas requiring specialized OCR processing are individually zoned so that the appropriate OCR options can be selected for them.

4.5 EXAMINING THE DOCUMENT

The condition, quality of printing, and orientation of the document can have significant impact on the effectiveness of the OCR process. Therefore, before scanning a document, it is important to examine all pages so that unusual conditions can be anticipated and appropriate options can be selected. If the document is creased or otherwise defective, the scanned image may cause OCR problems. If the document has interleaved portrait and landscape pages, options must be selected during zoning to accommodate the orientation of the individual pages.

Images of pages are numbered consecutively as the pages are scanned. The sequence of the OCR processing also follows these consecutive page numbers. Therefore, the sequence in which document pages are scanned determines the page numbers and the resulting sequence of the OCR text. It is important for the pages of the document to be scanned in the proper order to avoid confusion and improper sequencing of the output text file. Out-of-sequence pages should be reordered and missing pages should be found and inserted in their proper location before scanning begins.

Scanning may be done one page at a time, or an entire stack of pages may be scanned in a single operation. The scanning and zoning options for the document, such as the options to scan one page at a time or scan a stack of pages, are normally selected when scanning is initiated. Therefore, the document should be examined for conditions that require exception handling before scanning is started. Several conditions may require pages to be scanned individually:

- Bound documents cannot utilize the document feeder on the scanner and must be scanned one page at a time by positioning the document on the scanner bed.

- Documents with many figures and equations may require zoning to prevent OCR processing of selected areas of the pages. This zoning may be done after each page is scanned or may be deferred until all pages have been scanned.
- Documents that contain pages with interspersed landscape and portrait orientation require special handling after scanning to reorient the image before OCR processing.
- Documents containing pages with footnotes may require individual zoning for those pages so that the footnotes will appear in an appropriate sequence in the OCR text.

4.6 DETECTION OF OPTICAL CHARACTER RECOGNITION ERRORS

Scanning and OCR are susceptible to many types of errors that can affect the usability of the generated text. Scanning/OCR errors are detected in two ways by the system:

- When the image is processed for OCR, the characters are recognized and stored. If there is sufficient ambiguity in recognizing a particular character, it is flagged as a suspected scanning/OCR error.
- Following the initial OCR processing, the text is subjected to a spelling check to detect potential errors caused by incorrect character recognition that was not sufficiently ambiguous to cause flagging as a scanning/OCR error.

This automatic flagging of suspected errors facilitates document cleanup, but it is available only at the scanning station as an integral part the scanning/OCR/editing process. Once the document text and images have been exported, the error flagging is no longer available. Therefore, cleanup to correct OCR errors should be performed promptly while the source document is available for reference.

An option is provided in the export process to flag the scanning/OCR errors with a user-specified character in the output text file. This permits the cleanup process to be performed on other machines using standard text editors or word processors. However, this approach is not generally recommended because the exported text file will not support pop-up images of the scanning/OCR errors.

4.6.1 Scanner Options to Minimize Optical Character Recognition Errors

Several options are available to allow the scanner to be fine tuned to the document. These adjustments are not utilized for most documents, but may be required for documents with very low or very high contrast. See Appendices C and D for additional details.

4.6.2 Software Options to Minimize Optical Character Recognition Errors

Several software options are available to minimize OCR errors. These options condition the OCR software to expect certain types of data, and thereby limit the opportunities for misinterpretation of individual characters. The use of these options can result in a dramatic reduction in the number of OCR errors. Therefore they should be used wherever appropriate for the data being scanned.

- Dot matrix printing—This option conditions the OCR software to expect text printed on a dot matrix printer. The effect of this option is to make the OCR process slightly less sensitive so

that the dots making up the individual characters will not be misinterpreted (see Section 4.3.8).

- Numeric data—This zoning option conditions the OCR software to expect only numeric data in a specified zone. Therefore, the number of ways a particular character's image can be interpreted is limited. For example, the digit '0' will not be interpreted as an alphabetic 'O', and a digit '1' will not be interpreted as an alphabetic 'l' if numeric zoning is selected.

4.6.3 User Dictionaries

Following the OCR process, a spelling checker is utilized to detect potential OCR errors where there was not sufficient ambiguity to mark individual characters. However, the spelling checker may incorrectly flag a number of words as potential OCR errors simply because those words do not exist in the dictionary. To address the problem of these "false alarms," the system provides facilities for creating and maintaining user-defined dictionaries. Such dictionaries are very useful in identifying technical vocabularies that are specific to certain classes of document. Therefore, user-defined dictionaries should be created and maintained to expedite the document cleanup process.

4.7 DOCUMENT CLEANUP

While many suspected OCR errors can be detected and flagged automatically, the correction of those errors is an inherently manual process in which the operator compares the original document or image to the text generated by the OCR process. The manual cleanup of OCR text can be a very time consuming process, and it can also introduce additional errors if not performed carefully.

When documents are scanned and processed for OCR through the CDOCS on-demand facilities, the need to perform document cleanup is determined by the degree to which the end user of the text is able to tolerate OCR errors. If the end user only wants the images, then cleanup of the text is inappropriate. However, if the end user wants to utilize the text by storing it or incorporating it in another work product, then some level of document cleanup should be performed. At a minimum, any characters flagged as ambiguous by the OCR process should be examined and corrected. Also, words flagged by the spell check process should be visually reviewed and corrected if necessary. Words that are flagged incorrectly during the spell check process because they do not exist in the dictionary should be added to the appropriate user-defined dictionary.

When documents are scanned and processed for OCR through the CDOCS routine loading facilities, the need to perform document cleanup is great. This is because the impact on the effectiveness and usability of the system resulting from uncorrected scanning and OCR errors is extensive. CDOCS is a system that relies on full-text search and retrieval to locate and retrieve documents. Therefore, the user of the system must be able to formulate queries that will find the desired materials. This is predicated on the text being reasonably consistent and accurate. If the user searches for the word "containment" that word must exist in a document if the document is to be selected and retrieved. However, if scanning/OCR errors have distorted the spelling of the word (e.g., "contoinmant" rather than "containment," because the "a" was interpreted as an "o" and the "e" was interpreted as an "a"), the query will fail, and the document will not be selected.

Single character errors do not present insurmountable problems, but when alignment or distortion problems cause more serious errors such as: (i) words filled with punctuation, (ii) words

combined from separate lines, or (iii) multiple skipped words, the effectiveness of the search facilities are degraded. Uncorrected scanning/OCR errors are indexed in the full-text system and ultimately degrade the search and retrieval capabilities of the system. Therefore, appropriate document cleanup is necessary for all documents loaded into CDOCS.

4.8 SCANNING SOFTWARE AND HARDWARE

Scanning can be performed using either of the two following software packages. The necessary hardware is determined by the software.

4.8.1 ScanWorX

The scanning application software is ScanWorX by Xerox. System requirements are:

- Minimum Sun Workstation as described in Section 2.5.1.1
- Quarter inch QIC-24 or QIC-150 tape drive (for installing the ScanWorX software on the SUN Workstation)
- ScanWorX Scanner

Refer to *Appendix C ScanWorX—Scanning, Optical Character Recognition, and Document Cleanup* for scanning instructions.

4.8.2 M/Series Professional

The scanning application software is M/Series Professional by Calera Recognition Systems. System requirements are:

- DOS 5.0 or later
- Minimum Windows Workstation as described in Section 2.5.1.2
- Scanners:
 - Fujitsu
 - 3096G
 - 3093E/3096E+
 - Scan Partner
 - Hewlett Packard
 - ScanJet Plus, IIc, and IIp, with (ADFs)

Refer to *Appendix D Calera M/Series Professional—Scanning, Optical Character Recognition, and Document Cleanup* for scanning instructions.

5 DATABASE CUSTODIAN GUIDELINES

The previous chapters provided a general introduction to CDOCS and its primary functions and described the functions available to most CDOCS users. This chapter introduces the functions that are available to the database custodians for inputting, updating, and deleting documents.

5.1 CUSTODIAN AUTHORITIES AND PERMISSIONS

This chapter discusses authorities, permissions, and functions available to database custodians. Where functions available to the database custodian are the same as those available to CDOCS users, reference is made to prior sections of the *User's Guide*. Familiarity with the CDOCS primary functions presented in previous sections prepares the user to operate the CDOCS and utilize these additional functions.

While access to CDOCS for retrieval and viewing is generally available to the NRC and CNWRA staffs, database custodians are authorized to add, update, and delete records. After a record has been identified for entry into CDOCS, it is processed by the database custodian for submission. If records are to be updated or deleted, that action is also performed by the database custodian.

CDOCS has security requirements, of which the user is part of that security. When the custodian logs on to the system, the custodian's security permissions and authorities are made available to anyone using the terminal. Leaving the terminal unattended, but logged on, makes unauthorized use possible. Therefore, CDOCS should always be exited whenever the user is finished or whenever the terminal must be left unattended.

5.2 CONSOLIDATED DOCUMENT SYSTEM MAIN MENU

After the logon process has been completed, the system displays the *CDOCS Main Menu* for the database custodian (Figure 5-1). This screen contains a menu bar at the top of the screen with the following major functions that can be accessed by the database custodian.

Operations—Copy a regulatory program or OITS record, use WordPerfect to edit a regulatory program or OITS record, change passwords (for CNWRA users), or exit from CDOCS

Search—Use full-text and/or fielded information to find and access CDOCS records

Custodian—Perform operations to submit, update, delete, check-out/in CDOCS records and define, checkin, and retire regulatory program and OITS records



Figure 5-1. CDOCS main menu for database custodians

Report—Access CDOCS report facilities to display and/or print standard reports

Help—Access CDOCS help facilities

5.3 MAIN MENU—OPERATIONS ENTRY

The *Operations* entry in the menu bar of the *CDOCS Main Menu* permits performance of general functions that are available to all users. Selecting *Operations* from the menu bar of the *CDOCS Main Menu* causes the *Operations* pull-down menu to appear (Figure 5-2). This pull-down menu contains the functions that the database custodian's level of access permits, including copying regulatory program records, using WordPerfect to edit regulatory program records, changing the password, and exiting CDOCS. For further information about how to use the *Operations* entry in the *CDOCS Main Menu*, see Section 3.7. For further information on Password Logon, see Appendix A.

5.4 MAIN MENU—SEARCH ENTRY

CDOCS provides powerful and easy-to-use facilities for identifying and viewing records in the database. The TOPIC search and retrieval software is used to find records by searching for specific words or phrases in: (i) the text of the document, and/or (ii) certain document header fields, such as the author or title. For further information about how to use the *Search* entry in the menu bar of the *CDOCS Main Menu*, see Section 3.8.

5.5 MAIN MENU—CUSTODIAN ENTRY

In addition to functions available to other users, CDOCS provides capabilities for submitting, updating, deleting, checking in, and checking out CDOCS records, and maintaining regulatory program and OITS records. These facilities are available to the database custodian through the *Custodian* entry in

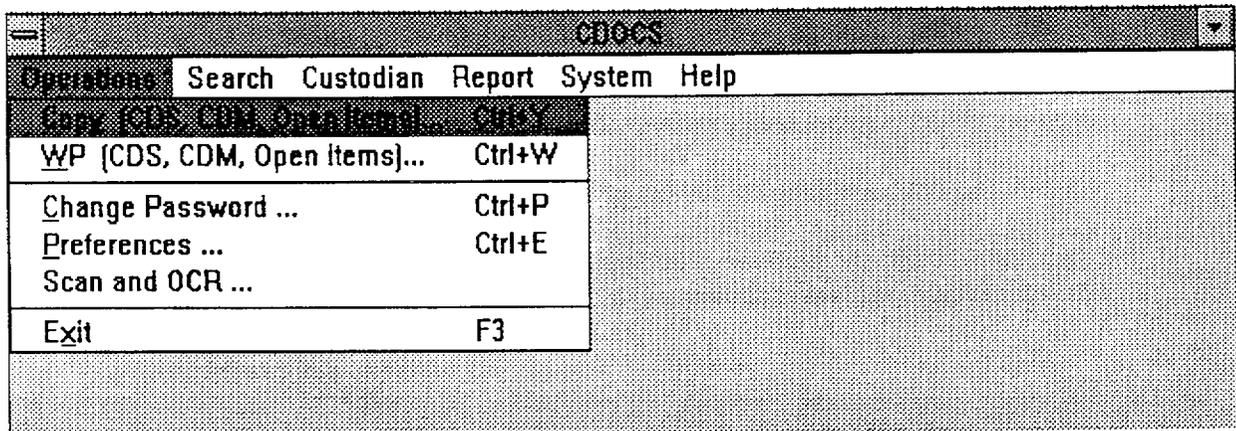


Figure 5-2. CDOCS Custodian Operations pull-down menu

the menu bar of the *CDOCS Main Menu* (Figure 5-1). When the *Custodian* entry is selected, a pull-down menu appears that contains entries for each of the maintenance functions available to the database custodian. Figure 5-3 illustrates the *Custodian* pull-down menu for NRC database custodians. Figure 5-4 illustrates the *Custodian* pull-down menu for CNWRA database custodians. The *NRC Custodian* pull-down menu permits access to the following maintenance functions:

Submit Record—Use CDOCS maintenance facilities to add new CDOCS records

Update Record—Use CDOCS maintenance facilities to update existing CDOCS records

Delete Record—Use CDOCS maintenance facilities to delete existing CDOCS records

Process a Regulatory Record—Access facilities for maintenance of regulatory program and OITS records

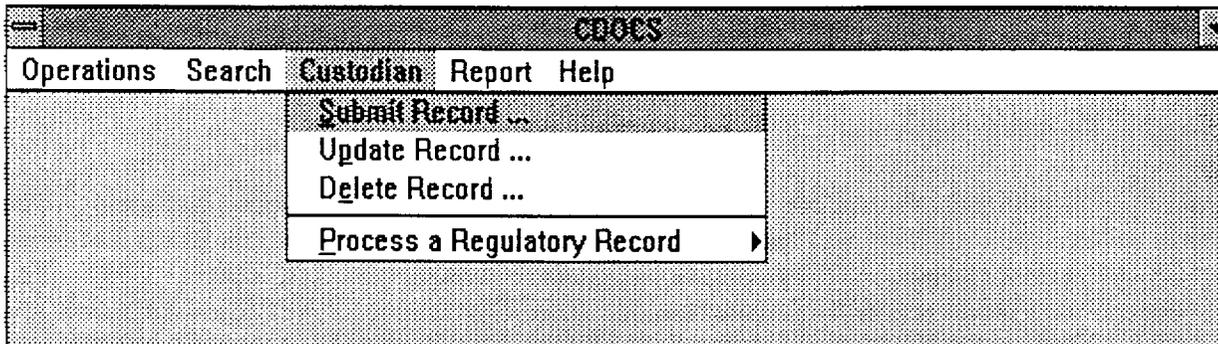


Figure 5-3. CDOCS—NRC Custodian pull-down menu

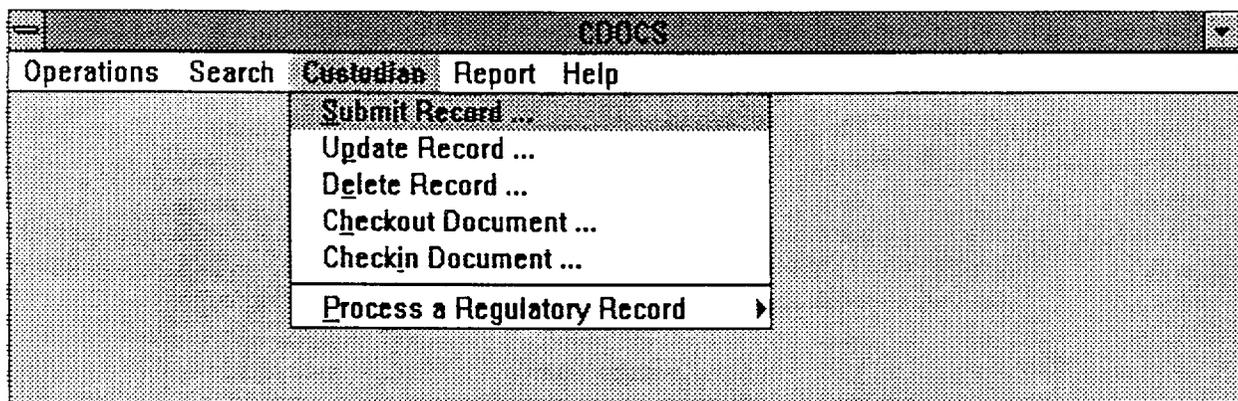


Figure 5-4. CDOCS—CNWRA Custodian pull-down menu

In addition to these capabilities, the CNWRA *Custodian* pull-down menu (Figure 5-4) contains the following functions that pertain to circulation control at the CNWRA library:

Checkout Document—Use CDOCS maintenance facilities to check a hard-copy document out of the CNWRA library

Checkin Document—Use CDOCS maintenance facilities to check a hard-copy document into the CNWRA library

5.6 CUSTODIAN FUNCTIONS

To access the database custodian facilities:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3 or Figure 5-4).
2. Select the desired function from the *Custodian* pull-down menu. The system executes the selected function.

5.6.1 Submitting New CDOCS Records

When *Submit Record* is selected from the *Custodian* pull-down menu, the *Submit a CDOCS Record* entry screen (Figure 5-5) appears with the NRC Technical Document Set in the *Document Set* pull-down as the default. CDOCS contains a number of document sets, such as NRC Technical Documents, CNWRA Technical Documents, CNWRA Reports, and NUREGS. Fields that are not applicable to the currently selected document set, such as *Addressee(s)* and *Duration*, are grayed out and the field cannot be accessed. The *Submit a CDOCS Record* screen includes both mandatory and optional fields. Optional fields are indicated by an asterisk (*) next to the field name on the left side of the screen.

The *Document Number* field is used to display the document number assigned by the system after the *Submit* push-button is selected. Therefore, no information is entered in the *Document Number* field.

To enter the data in the fields for a specific document (this example illustrates a document from the NRC Technical Document set.

1. Enter the author name in the *Author(s)* entry field. The author name is entered as a last name followed by initials. If there are multiple authors, their names should be entered separated by semicolons. For example: Johnson, G.M.; Smith, L.O.

At the right side of the *Author(s)* entry field (and other fields such as *Title* and *Publication*), there is a small square push-button with three dots. This push-button is used to expand the entry field when there is more than one line of information to input. When this button is selected, a new screen appears with a scrollable entry field (Figure 5-6). The information may be entered as several lines. When the information has been entered, select

Figure 5-5. CDOCS Submit—NRC Technical Document entry screen

the *OK* push-button at the bottom of the screen. The information that was entered is copied to the corresponding data field.

2. Enter the title in the *Title* entry field. If the title is too long to fit in the *Title* entry field, select the push-button with three dots next to the *Title* entry field to obtain an extended entry field screen (Figure 5-6). The title is normally entered with initial capital letters.
3. In the *Publication* field, enter pertinent document information, such as publisher's name, publisher's location, pages, journal name, etc. If the information is too long to fit in the *Publication* entry field, select the push-button with the three dots next to the *Publication* entry field to obtain an extended entry field screen.
4. Enter the document date in the *Document Date* entry field. The document date is entered in the form DD MON YYYY, where DD is two digits representing the day of the month, MON is a three-character abbreviation for the month, and YYYY is the full four-digit

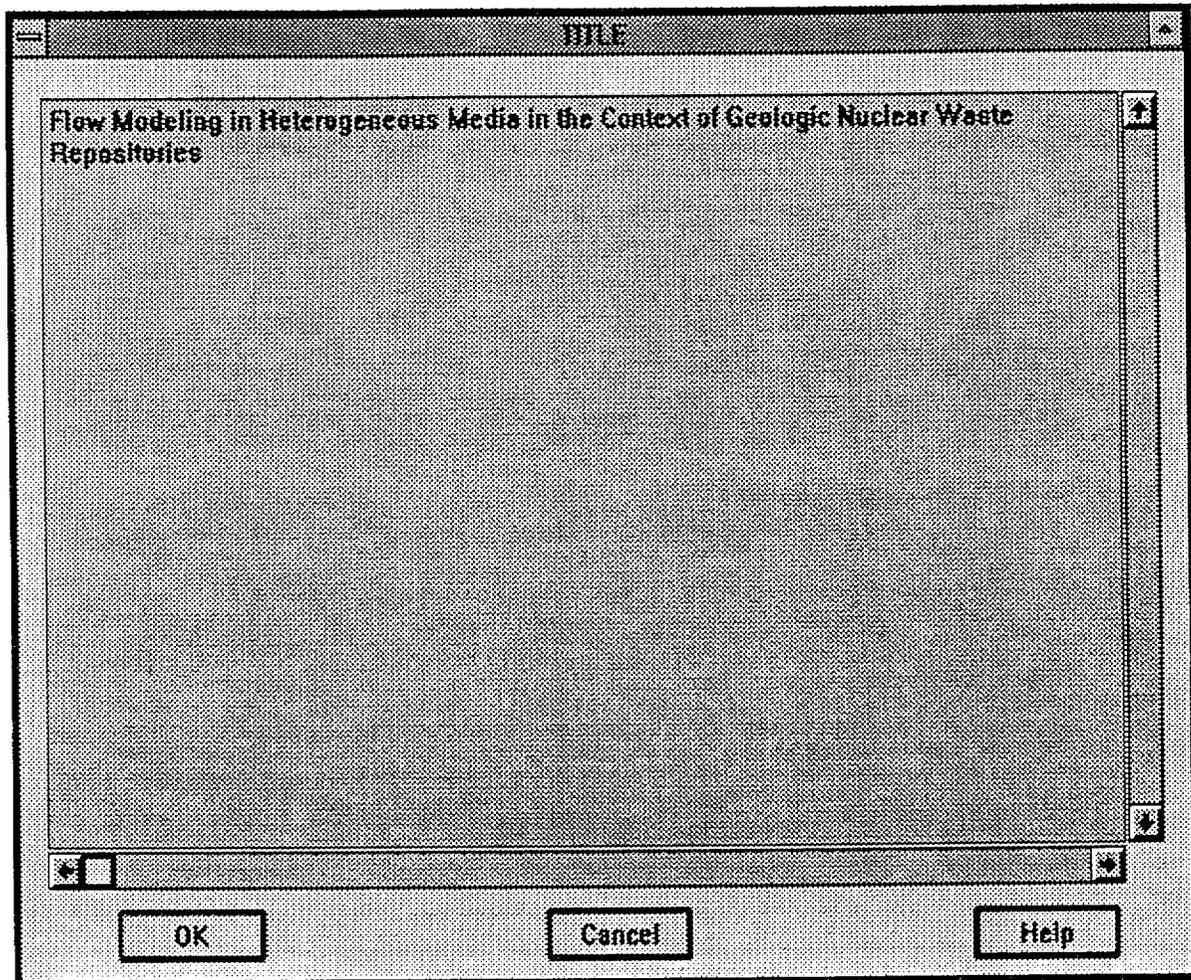


Figure 5-6. CDOCS Submit—extended entry-field screen

year. If the day portion of the date is not available, enter "01" for the day. If the month is not available, enter "JAN" for the month.

5. If appropriate, enter code(s) assigned to the document in the optional *Code(s)* field. Multiple codes may be entered separated by semicolons.
6. If appropriate, enter the report number or other identifying number associated with the document, such as revision number or software vendor and version identifier in the optional *Number(s)* field. Multiple numbers may be entered, separated by semicolons.

7. An optional field, *Note*, is provided to enter any other relevant information about the document.
8. If the document is to be shared between the NRC and the CNWRA, click on the box next to *sharable*. If the document is not to be shared, do not click the box. The effect of making a document shareable is defined below:
 - Shared—Both local and remote databases are updated.
 - Unshared—Local database is updated, remote database is not updated.
9. At the bottom of the screen is a field titled *Directory where files reside*. The field is initialized to “None” indicating a header only document. If the document includes text, word processing, and/or image files, the directory where the files are stored must be specified in this field. Enter the directory name or use the drop-down indicator at the right of this field to select the directory where the text, word processing, and image files for the document that is being submitted are located (Figure 5-7). If the directory does not appear in the drop-down list, then key in the path to the directory.

The screenshot shows a window titled "CDOCS Submit" with the following fields and controls:

- Document Set:** A dropdown menu set to "NRC Technical Documents".
- Document Number:** An empty text input field.
- Document Header:** A section containing several fields:
 - Author(s):** "Sagar, B."
 - Address(es):** Empty.
 - Title:** "Flow Modeling in Heterogeneous Media in the Context of Geologic Nuclear Wa..."
 - Publication:** "CNWRA"
 - Document Date:** "01 Oct 1995"
 - Code(s):** "810.2"
 - Number(s) *:** Empty.
 - Duration:** Empty.
 - Note *:** Empty.
 - Sharable:** A checked checkbox.
- *Optional Values:** A label for the optional fields.
- Directory where files reside:** A dropdown menu currently set to "None".
- Submit:** A button located to the left of the directory dropdown.
- Help:** A button located to the right of the directory dropdown.

Figure 5-7. CDOCS Submit—directory where files reside

10. After entering all of the information for the record, review it for completeness and accuracy and make corrections as needed. To submit the record to CDOCS, select the *Submit* push-button at the bottom of the screen.

When the *Submit* push-button is selected, the transaction is validated. If errors are found, appropriate error messages are displayed. If no errors are found, the *Submit* transaction is accepted, an advisory message is displayed, and a document number is assigned to the record. The document number is displayed in the *Document Number* field at the top of the screen.

After the *Submit* transaction has been processed and the advisory message has been cleared, the screen is locked, but the information entered in the previous *Submit* transaction remains in the input fields. This action permits efficient submission of sets of related documents by altering only the information that has changed.

11. To enable the *Submit a CDOCS Record* screen so that a new record may be entered, select the *Reset* push-button at the bottom of the screen. The entry screen is enabled to permit entry of the information for the next record.
12. To exit from the document submission process, select the *Close* push-button at the bottom of the screen.

5.6.2 Updating Records from the Consolidated Document Management System

CDOCS document updates are always handled as a complete replacement of the existing document header record and, optionally, a replacement of the document text and image files. If new text and image files are submitted, the existing files are deleted, and the new files are added to the CDOCS database. Updating a record requires that the user specify the document set and document number that was assigned automatically when the record was submitted to CDOCS. These two data elements (document set and document number) uniquely identify the record to be updated. If it is necessary to locate a document number, use the TOPIC full-text search facility to retrieve the document. The document number is displayed in the header information.

To update a CDOCS record:

1. If the *CDOCS Update* screen (Figure 5-8) is not visible, select *Update Record* from the *Custodian* pull-down menu in the *CDOCS Main Menu* (Figure 5-3).

The *CDOCS Update* screen appears and the *Document Set* drop-down list is initialized to *NRC Technical Documents* by default (Figure 5-8). To select a Low-Level Waste record for update, the *Document Set* must be changed to Low-Level Waste. If necessary, select the *Document Set* drop-down indicator and then select Low-Level Waste to change the document set.

2. Key in the number of the document to be updated in the *Document Number* entry field.

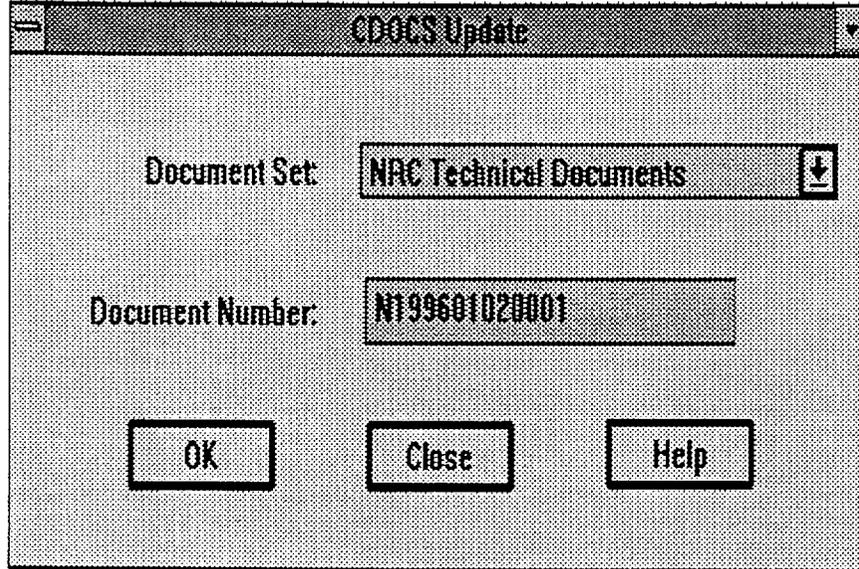


Figure 5-8. CDOCS Update screen

3. Select the *OK* push-button at the bottom of the screen. The *CDOCS Update* entry screen is displayed (Figure 5-8).

The *CDOCS Update* entry screen is very similar to the *CDOCS Submit* screen. The *Document Number* field displays the number entered in the *CDOCS Update* screen. This number cannot be updated.

4. Key in the updated document header information in the appropriate fields of the *CDOCS Update* entry screen (Figure 5-9).
5. The effect of the shareable flag during a record update is defined in Table 5-1.

Note: A shared document cannot be updated as unshared. If the *Sharable* button is grayed in the update screen, then the document is shared. To update and unshare a document, the document must be resubmitted as unshared.

6. If new ASCII text, word processing, or image files are to be submitted with the update, select the path to the directory from the *Directory where files reside* field drop-down menu, or key the path to the directory into the field. If no files are being submitted, select "None" in the *Directory where files reside* field. If no files are submitted, only the document header is updated.

CDOCS Update

Document Set: Document Number:

Document Header:

Author(s)

Addressee(s)

Title

Publication

Document Date

Code(s)

Number(s) *

Duration

Note *

Sharable *Optional Values

Directory where files reside

Figure 5-9. CDOCS Update entry screen

Table 5-1. Effect of sharable flag during record update

Prior Sharing Status	Updated Sharing Status	Local Database	Remote Database
Shared	Unshared	A shared document cannot be updated as unshared. The unshared update must be submitted as a new document.	
Unshared	Shared	Record is updated.	Record is submitted.
Shared	Shared	Record is updated.	Record is updated.
Unshared	Unshared	Record is updated.	No action.

7. When all of the updated information has been entered, select the *Update* push-button at the bottom left of the screen. When the update has been successfully completed, a confirmation screen displays (Figure 5-10). To exit the record update screen without performing an update, select the *Close* button.

5.6.3 Deleting Records from the Consolidated Document System

CDOCS includes facilities for deleting records from the document sets. Deletion of records requires that the user specify the document set and the document number that was assigned automatically when the record was submitted to CDOCS. These two data elements uniquely identify the record to be deleted. If it is necessary to locate a document number, use the TOPIC search facility to retrieve the document. The document number is displayed in the header information.

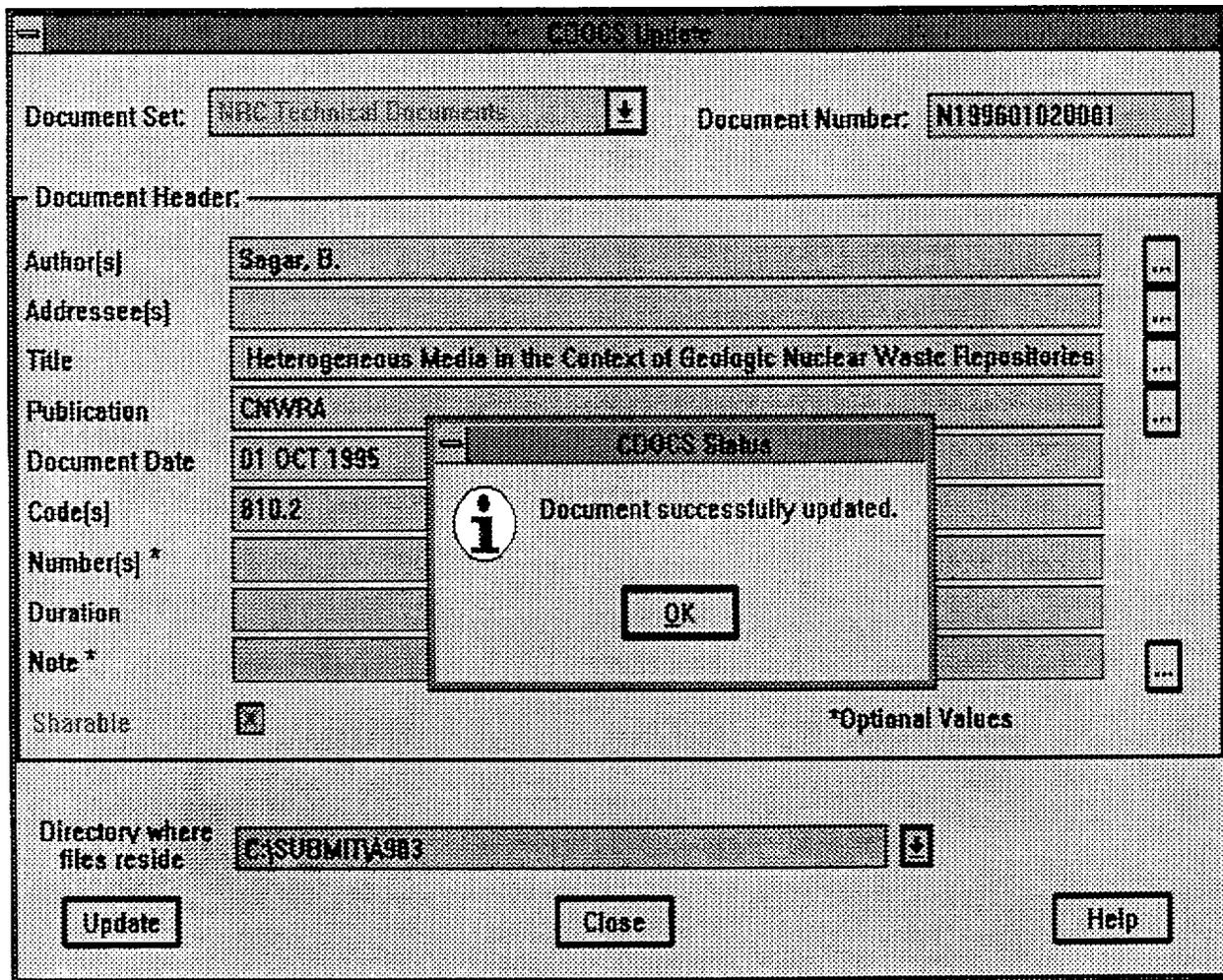


Figure 5-10. CDOCS Update confirmation screen

To delete a record from CDOCS:

1. If the *CDOCS Delete* screen (Figure 5-11) is not visible, select *Delete Record* from the *Custodian* pull-down menu in the *CDOCS Main Menu* (Figure 5-3). The *Delete Record* entry screen (Figure 5-11) appears and the *Document Set* drop-down list is initialized to the default document set—NRC Technical Documents. For example, to select a Low-Level Waste record for deletion, select the *Document Set* drop-down indicator and then select Low-Level Waste.
2. Enter the document number of the document to be deleted in the *Document Number* entry field and press the *OK* push-button. The document deletion confirmation screen displays (Figure 5-12).
3. Set the shareable flag as required by selecting the *Shareable* box. The result of deleting shared files is defined below:
 - Shared record—deleted in both local and remote databases.
 - Unshared record—deleted in local database; no action is taken at remote database.
4. Verify that the document displayed is the document to be deleted. If the document displayed is the document to be deleted, press the *Delete* push-button at the bottom of the screen. When the document has been deleted, the system displays a *Document Deleted* response screen (Figure 5-13).

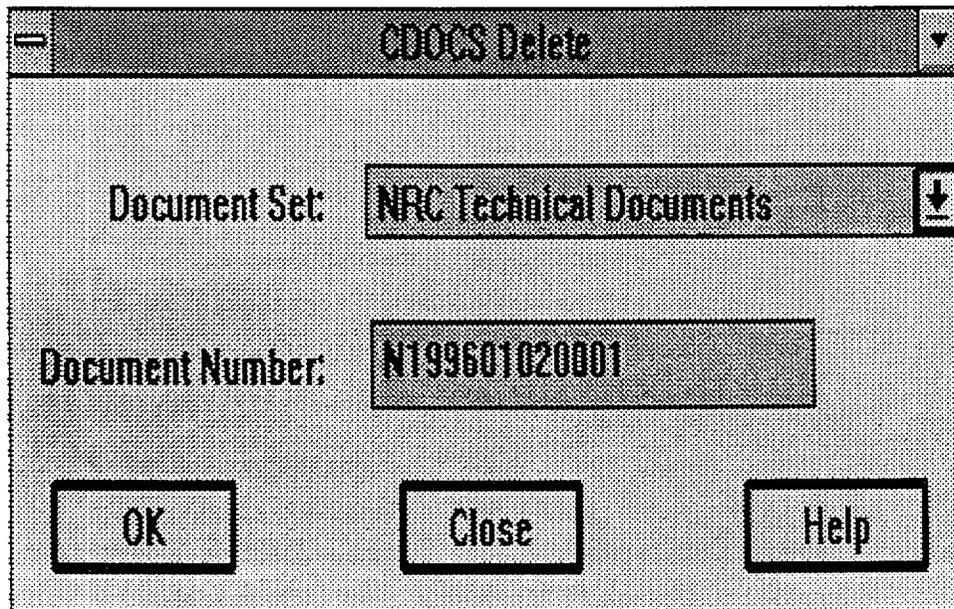


Figure 5-11. CDOCS Delete screen

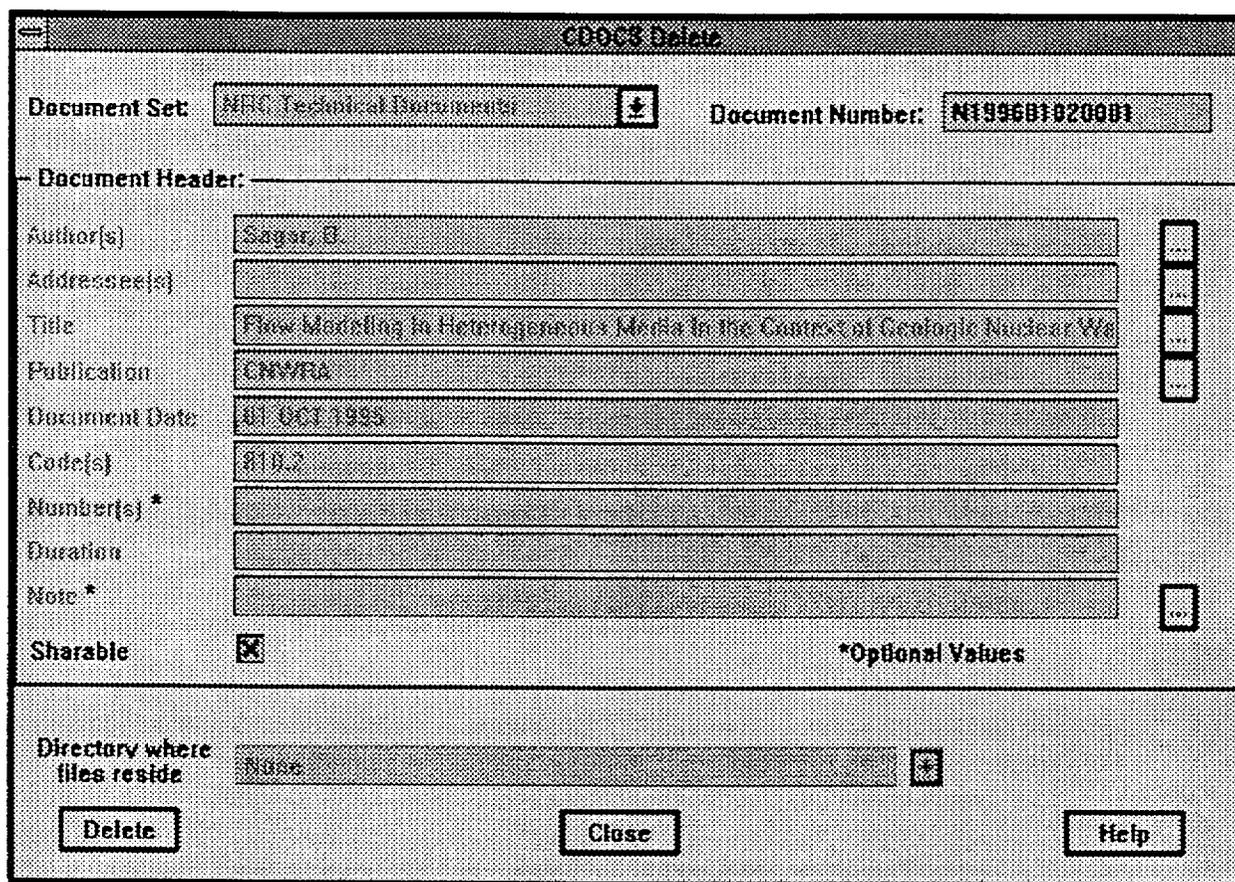


Figure 5-12. CDOCS Delete confirmation screen

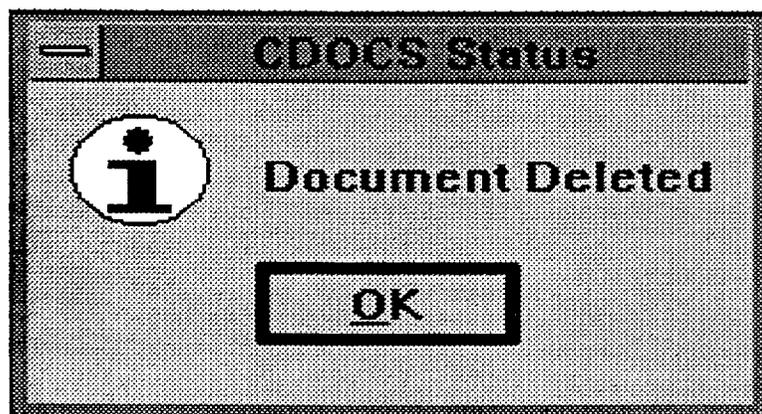


Figure 5-13. Document deleted response screen

If the document displayed is not the document to be deleted, press the *Close* push-button to exit the screen without deleting the document.

5.7 CUSTODIAN FUNCTIONS FOR REGULATORY RECORDS

When the *Custodian* entry is selected, a pull-down menu appears that contains entries for each of the maintenance functions available to the database custodian. Figure 5-3 illustrated the *Custodian* pull-down menu for the NRC database custodian. Figure 5-4 illustrated the *Custodian* pull-down menu for CNWRA database custodians. When the *Process a Regulatory Record* entry is selected from the *Custodian* pull-down menu a cascading menu appears that contains options for maintaining regulatory records (Figure 5-14). The *Process a Regulatory Record* cascading menu permits access to the following maintenance functions:

Define a Regulatory Record—Use CDOCS maintenance facilities to define new regulatory records.

Retire a Regulatory Record—Use CDOCS maintenance facilities to retire existing regulatory records.

Format Check a Regulatory Record—Use CDOCS maintenance facilities to check the format of a regulatory record.

Enter a Regulatory Record—Use CDOCS maintenance facilities to enter a new version of a regulatory record.

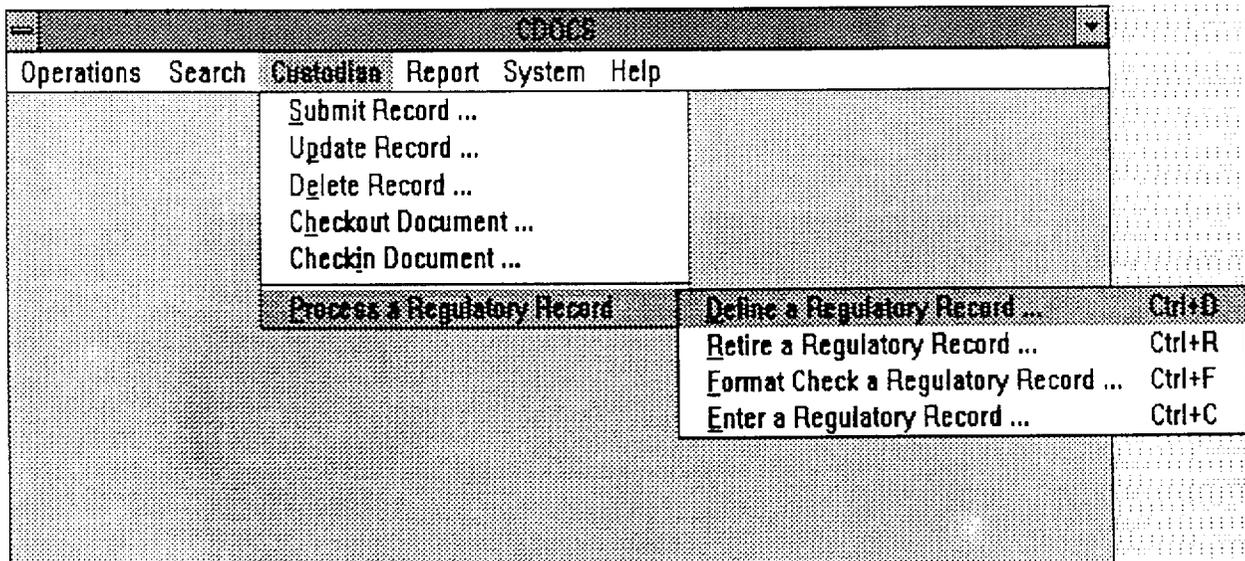


Figure 5-14. CDOCS Process a Regulatory Record cascading menu

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the desired function from the *Process a Regulatory Record* cascading menu. The system executes the selected function.

5.7.1 Defining New Regulatory Records

Record header information, such as title and review plan number for regulatory program records, and OITS identifier and OITS topic for OITS records, must be preloaded in the database before textual data associated with the regulatory records may be checked in. Conceptually, the record header preloading process creates a place for the data, and the entry process actually stores the textual information. When a record is preloaded, the system reserves space in the relational database and in the full-text repository by formatting and storing placeholder records that contain the text.

The record definition and header preloading process requires an entry screen through which the document type, review plan number, and title are entered. To define a new regulatory program record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Define a Record* entry from the *Process a Regulatory Record* cascading menu. Alternatively, you may press the mnemonic key [d]. The *Define a Regulatory Program Record* entry screen appears (Figure 5-15).
4. Select the *Document Type* pull-down indicator to display the pull-down list of document types (Figure 5-16), and select the desired document type (CDS, CDM, RPS, or OITS). The drop-down list will display the selected type of document and the *Define a Regulatory Program Record* entry screen will be prepared for entry of data.
5. Enter the review plan number for the new record in the *Review Plan Number* entry field (Figure 5-15).
6. Enter the title for the new record in the *Title* entry field. Note that if you type more than one line, the title will automatically wrap to another line. If you enter more information

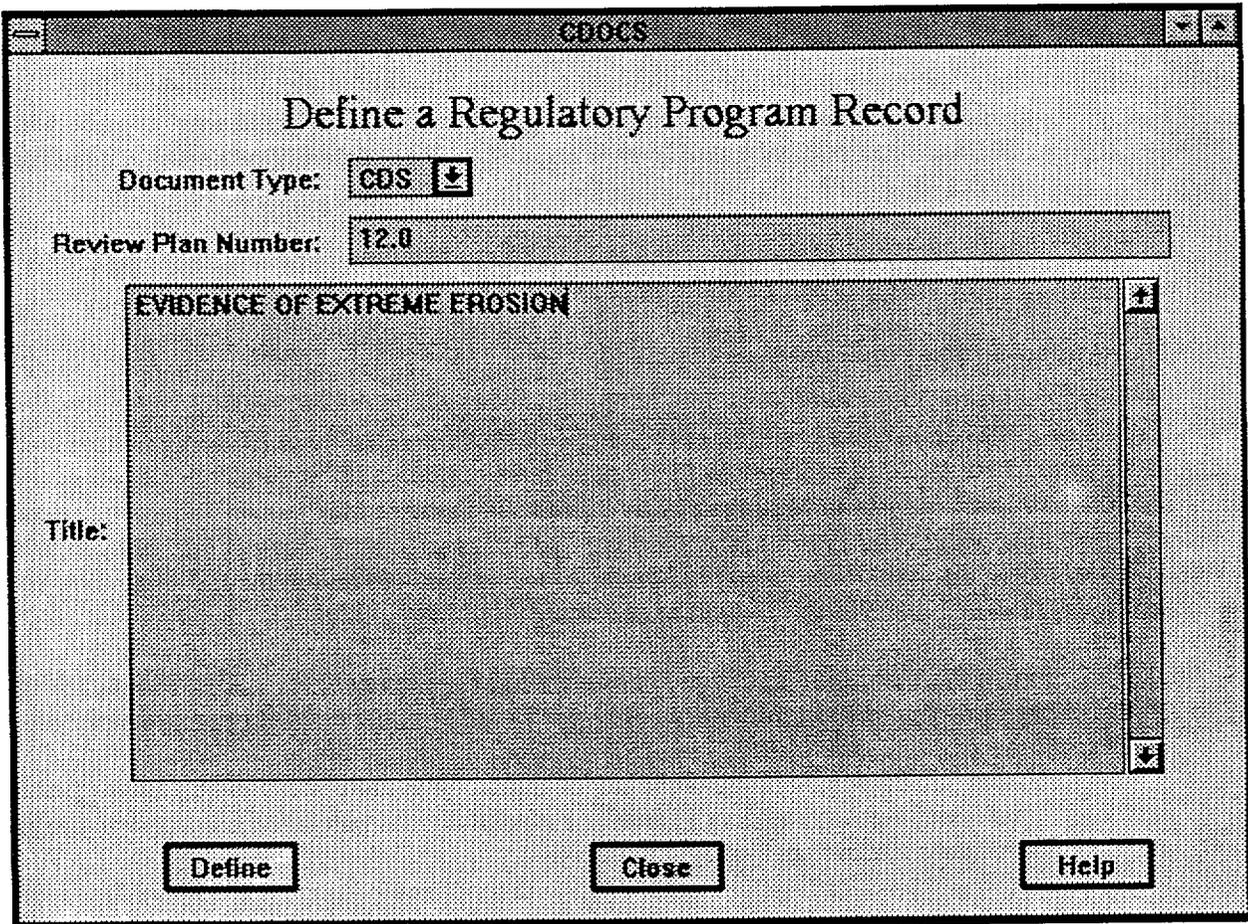


Figure 5-15. Define a Regulatory Program Record input screen

than will display in the *Title* entry field, you may view the information that is not currently visible by moving the vertical scroll bar at the right-hand side of the *Title* entry field.

7. Visually review the information you have entered and make corrections if necessary. When all of the information is correct, select the *Define* push-button at the bottom of the *Define a Regulatory Program Record* entry screen to accept the record and update the database.

If an error is detected (e.g., the review plan number already exists for the type of document you have selected), an error message will display, and you will not be permitted to continue until the error condition has been resolved.

A few seconds are required to update the database. During this time, the *Define* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the update has been completed, the *Define* push-button will return to

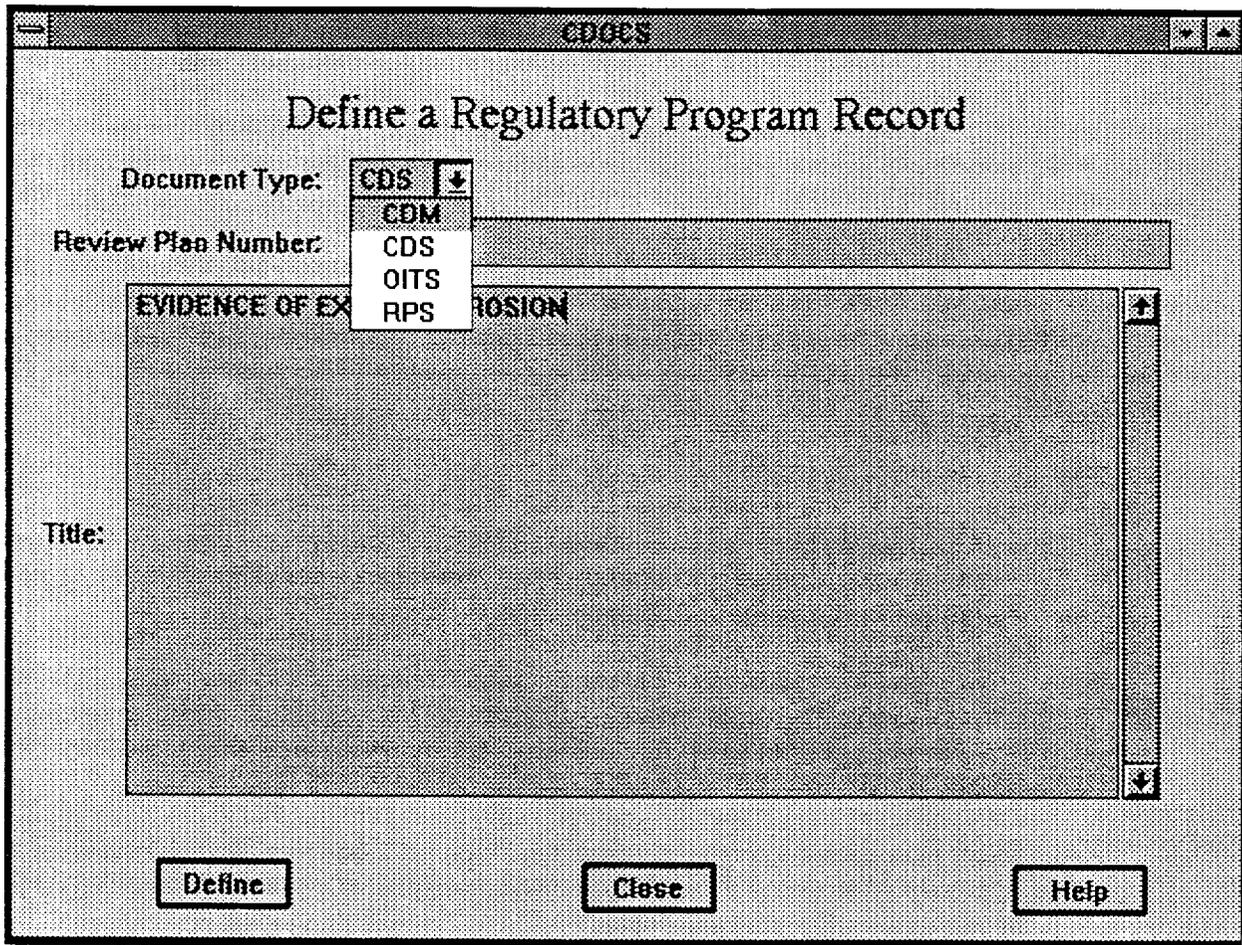


Figure 5-16. Define a Regulatory Program Record document type selection

its normal appearance, and a message will display indicating whether or not the update was successful. If, for any reason, the update was not successful, an error message will display, providing further information and instructions. In general, only internal system problems will make the update process fail. Therefore, if an error message appears indicating that the update was not successful, you should follow the instructions in the error message and/or its associated help message, and contact the database administrator immediately at (210) 522-5258.

8. To exit from the *Define a Regulatory Program Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Define* push-button, any information that you have entered will be discarded.

5.7.2 Defining New Open Item Tracking System Records

Record header information for OITS records, such as OITS identifier and topic, must be preloaded in the database before textual data associated with the records may be entered. As with regulatory program records, the record header preloading process creates a place for the data, and the check in process actually stores the textual information. When a record is preloaded, the system reserves space in the relational database and in the full-text repository by formatting and storing placeholder records that contain the text.

The OITS record definition and header preloading process requires an entry screen through which the document type, OITS identifier, and topic are entered. When the define functionality is selected, the record definition screen for regulatory program records appears (Figure 5-3). When the *OITS* option is selected for *Document Type*, the appearance of the screen changes to accommodate entry of OITS information (Figure 5-17).

To define a new OITS record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Define a Record* entry from the *Process a Regulatory Record* cascading menu. Alternatively, you may press the mnemonic key [d]. The *Define a Regulatory Program Record* entry screen appears (Figure 5-15).
4. Select the *Document Type* pull-down indicator to display the pull-down list of document types (Figure 5-16), and select the OITS document type.

The *Document Type* drop-down list will display OITS and the *Define an OITS Record* entry screen will be prepared for entry of data (Figure 5-17).

5. Enter the OITS identifier for the new record in the *OITS ID* entry field.
6. Enter the topic for the new record in the *Topic* entry field. Note that if you type more than one line, the topic will automatically wrap to another line. If you enter more information than will display in the *Topic* entry field, you may view the information that is not currently visible by moving the vertical scroll bar at the right-hand side of the *Topic* entry field.
7. Visually review the information you have entered and make corrections if necessary. When all of the information is correct, select the *Define* push-button at the bottom of the

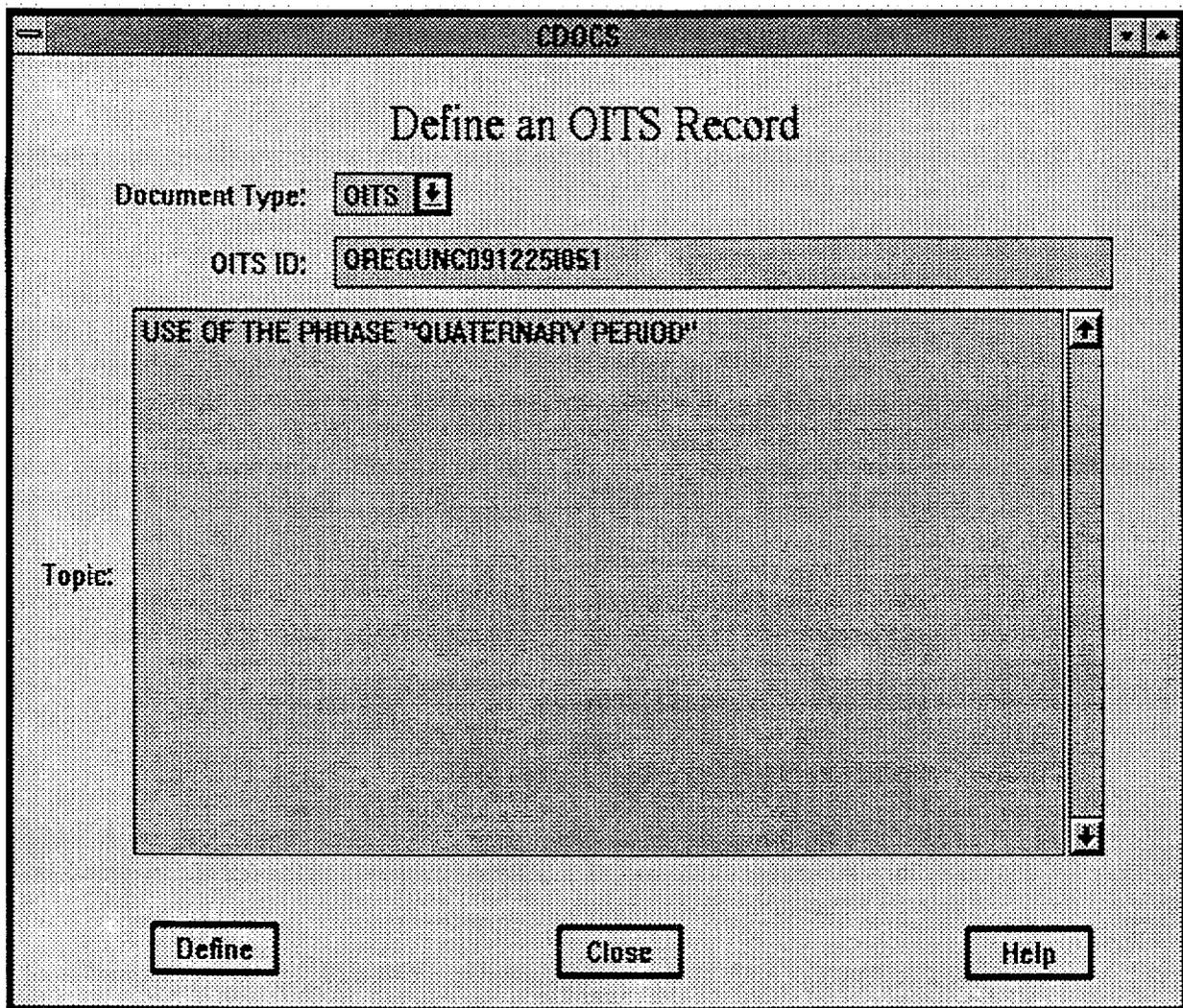


Figure 5-17. Define an OITS Record

Define an OITS Record entry screen to accept the record and update the database.

If an error is detected (e.g., the OITS identifier already exists), an error message will display, and you will not be permitted to continue until the error condition has been resolved.

A few seconds are required to update the database. During this time, the *Define* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the update has been completed, the *Define* push-button will return to its normal appearance, and a message will display indicating whether or not the update was successful. If, for any reason, the update was not successful, an error message will display

providing further information and instructions. In general, only internal system problems will make the update process fail. Therefore, if an error message appears indicating that the update was not successful, you should follow the instructions in the error message and/or its associated help message, and contact the database administrator immediately at (210) 522-5258.

8. To exit from the *Define an OITS Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Define* push-button, any information that you have entered will be discarded.

5.7.3 Enter New and Updated Records

Once a record has been defined in the database, the textual information associated with that record may be entered. The check in process is used: (i) whenever the text of a new record is loaded for the first time or (ii) whenever a record's text is changed and reloaded. The information to be entered is submitted as a WordPerfect file on a diskette or on the network hard disk. This data file must be correctly identified and validated through the appropriate entry screen before the data is accepted and updated in CDOCS.

The entry screens for regulatory program records (CDS, CDM, and RPS) differ from those for OITS. Therefore, the entry processes for regulatory program and OITS records are treated separately.

5.7.4 Enter Regulatory Program Records

To enter a regulatory program record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Enter a Regulatory Record* entry from the *Process a Regulatory Record* cascading menu. Alternatively, you may press the mnemonic key [c]. The *Enter a Regulatory Program Record* entry screen will appear and the *Document Type* pull-down indicator will be set to the default value of CDM (Figure 5-18).
4. If a different document type is required, select the *Document Type* pull-down indicator to display the pull-down list of document types, and select the desired document type (e.g., CDS, CDM, or RPS) (Figure 5-19). All of the active and defined review plan numbers and titles for the selected document type will appear in the *Review Plan Number and Title* list view. Note that the information in this list view may be scrolled horizontally and vertically.

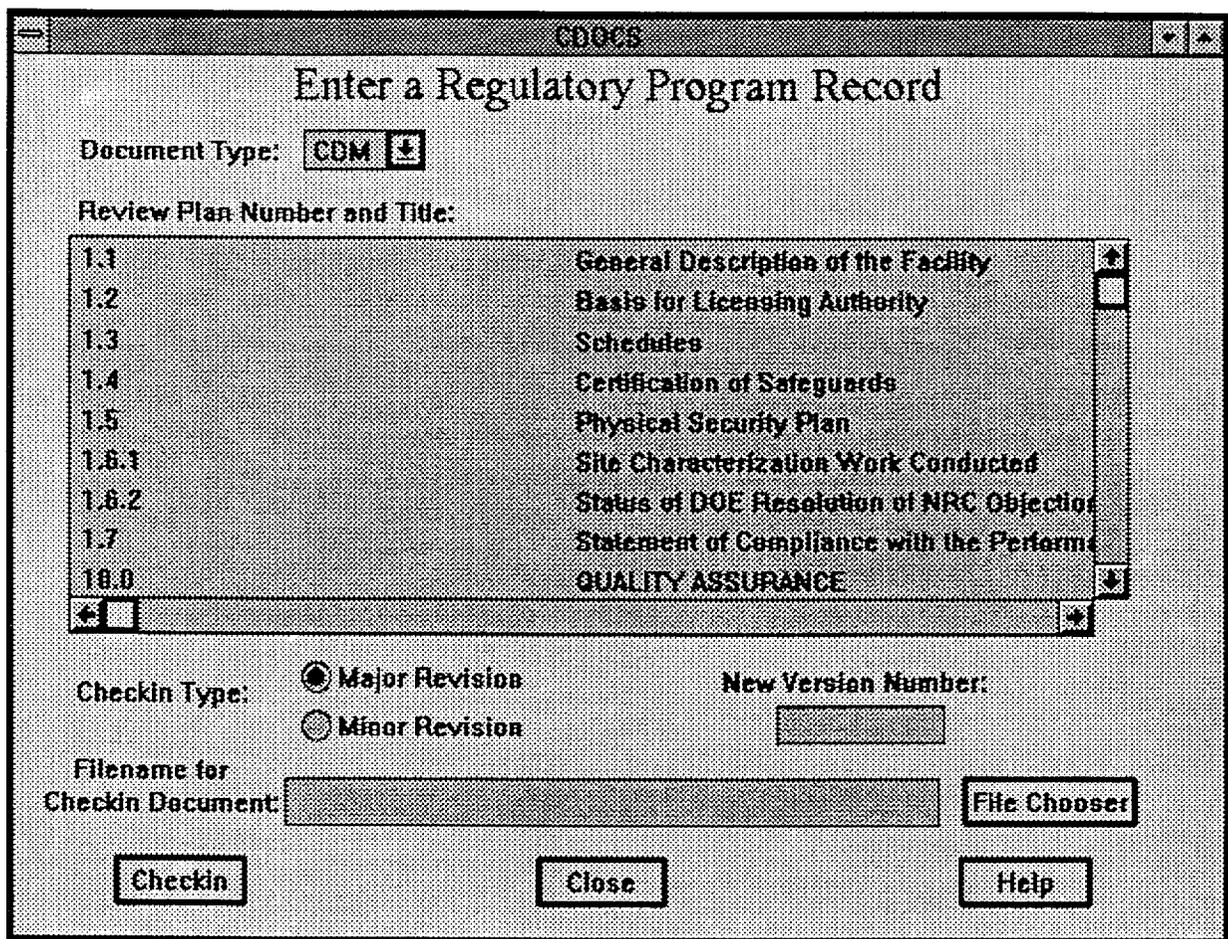


Figure 5-18. Enter a Regulatory Program Record input screen

5. Select the line in the *Review Plan Number and Title* list view that contains the desired review plan number and title.
6. Select either the *Major Revision* or *Minor Revision* radio button under the *Entry Type:* heading
7. Enter the appropriate number in the *New Version Number* entry field for the document being entered. The system will also compute a new version number based on the current version number and the type of change (major or minor). This new computed version number will be compared to the version that you have entered. If they do not match, the system will display an error message, and you will be permitted to: (i) change the version number that you have entered, or (ii) exit from the *Enter a Regulatory Program Record* entry screen by selecting the *Close* push-button at the bottom of the screen.

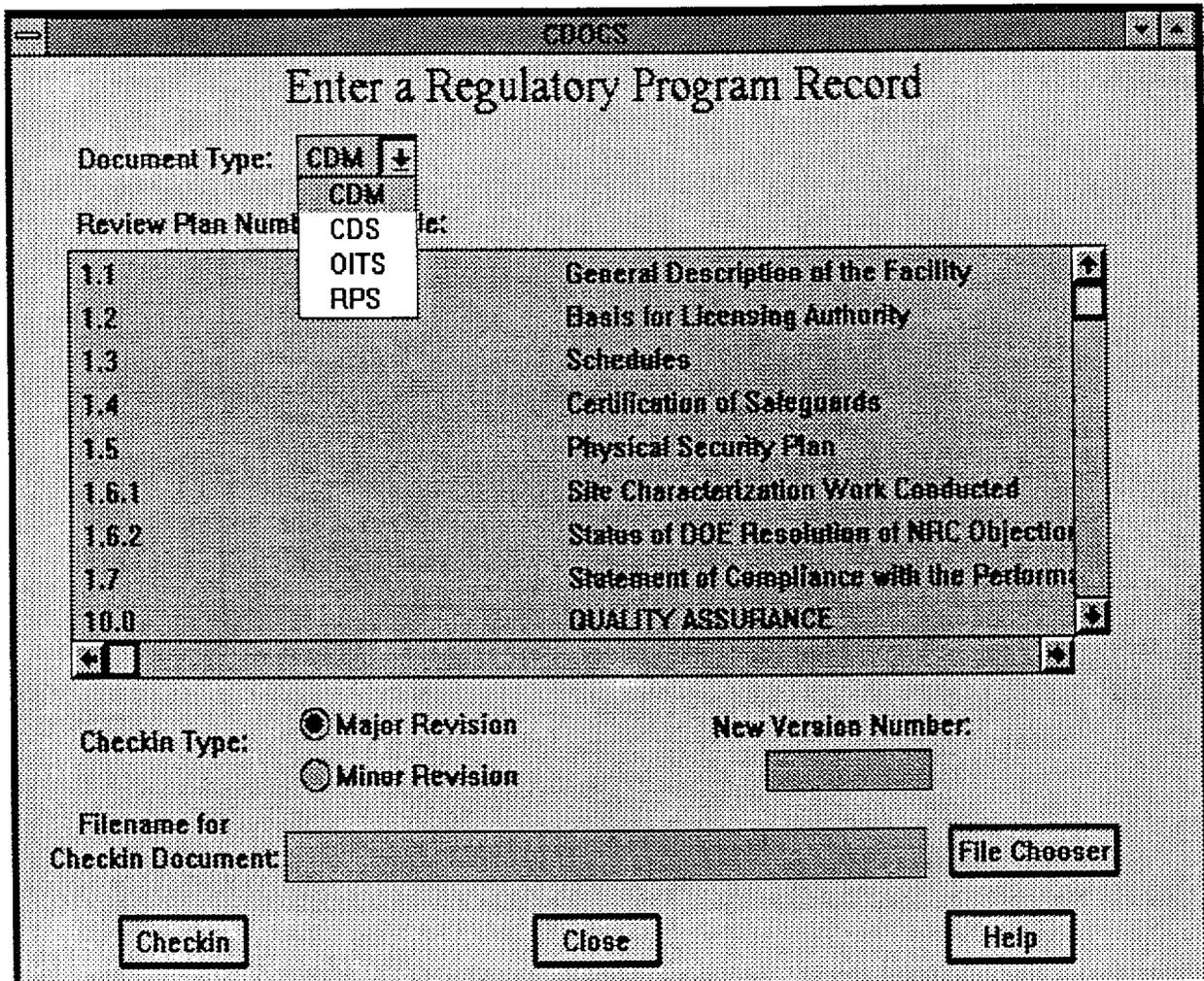


Figure 5-19. Enter a Regulatory Program Record document type selection

8. Enter the *Filename for Entry Document* in the space provided. If you are not sure of the file name, you may select the *File Chooser* push-button next to the *Filename for Entry Document* entry field. This will cause a list of files to be displayed (Figure 3-7), and you may select the desired disk, directory, and file name.
9. Visually review the information you have entered, and make corrections if necessary.
10. When all of the information is correct, select the *Enter* push-button at the bottom of the *Enter a Regulatory Program Record* entry screen to accept the entry information and update the database. A few seconds are required to perform the entry process. During this time, the *Enter* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the check in process has been completed, the *Enter*

push-button will return to its normal appearance, and a message will display indicating whether or not the entry was successful.

If, for any reason, the entry was not successful, an error message will display, providing further information and instructions. Several conditions can cause the entry process to fail in ways that cannot be immediately corrected by the operator. If any of the following conditions is indicated, the entry process will be terminated automatically, and you will have to correct and resubmit the data: (i) internal system problems, (ii) a corrupted WordPerfect input file, (iii) an input file that is not in WordPerfect format, or (iv) an input file that the system cannot parse to find the document type, review plan number, and title.

There is one condition that causes the entry process to pause and ask for operator confirmation. If the document type, review plan number, or title in the submitted document file does not match the corresponding information on the *Enter a Regulatory Program Record* screen, the system will assume that the wrong file has been submitted. This will cause the system to pause and display an error message, showing the expected versus the submitted document type, review plan number, and title. In some cases, such as when a change occurs in the title of a document, you may want to verify that the correct document has been selected by checking the review plan number, and then accept the input document file and override the title in the *Enter a Regulatory Program Record* screen information by selecting the *Force Entry* push-button at the bottom of the error message screen. This action must be approved in accordance with TOP-001-015, RPD Loading Control, Version Control, and Change Control (Center for Nuclear Waste Regulatory Analyses, 1993). If you do not want to accept the input document file, you may exit from the *Enter a Regulatory Program Record* screen by selecting the *Close* push-button at the bottom of the error message screen.

11. To exit from the *Enter a Regulatory Program Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Checkin* push-button, any information that you have entered will be discarded.

5.7.5 Enter Open Item Tracking System Records

To enter an OITS record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Enter a Regulatory Record* entry from the *Process a Regulatory Record* cascading menu. Alternatively, you may press the mnemonic key [c]. The *Enter a*

Regulatory Program Record entry screen will appear and the *Document Type* pull-down indicator will be set to the default value of CDM (Figure 5-19)

4. To access the entry screen for OITS records, you must select the OITS document type. Select the *Document Type* pull-down indicator to display the pull-down list of document types, and select the *OITS* entry (Figure 5-19). The appearance of the screen will change and all of the active and defined OITS identifiers and topics will appear in the *OITS ID and TOPIC* list view. Note that the information in this list view may be scrolled horizontally and vertically.
5. Select the line in the *OITS ID and Topic* list view that contains the desired OITS identifier and topic. The *Enter an OITS Record* screen will display (Figure 5-20).

The screenshot shows a window titled "CDOCS" with the main heading "Enter an OITS Record".

Document Type: **OITS** (dropdown menu)

OITS ID and Topic:

0A0B17APR1992C001	Disposal of waste forms other than SF and
0A0B17APR1992C002	Misplacement of potential impacts to the a
0A0B17APR1992C003	Misplacement of discussion on performan
0A0B28MAY1993C001	PAC's may not be appropriately considere
0A0B28MAY1993C002	Consideration of present PAC/FACs may be
0A0B28MAY1993C003	Lack of clear relationship between PAC/FA
0A0B28MAY1993C004	Seismic network monitoring and geodetic
0A0B30NOV1993C001	Repository systems approach of FCRG no
0A0B30SEP1992C001	Possible occurrences of potential disrupti

Checkin Type: Major Revision Minor Revision

New Version Number:

Rename for Checkin Document: **File Chooser**

Checkin **Close** **Help**

Figure 5-20. Enter an OITS record

6. Enter the *Filename for Entry Document* in the space provided. If you are not sure of the file name, you may select the *File Chooser* push-button next to the *Filename for Entry Document* entry field. This will cause a list of files to be displayed (Figure 3-7), and you may select the desired file and select the *OK* push-button.
7. Visually review the information you have entered, and make corrections if necessary.
8. When all of the information is correct, select the *Enter* push-button at the bottom of the *Enter an OITS Record* entry screen to accept the check in information and update the database. A few seconds are required to perform the check in process. During this time, the *Enter* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the check in process has been completed, the *Enter* push-button will return to its normal appearance, and a message will display indicating whether or not the check in was successful.

If, for any reason, the entry was not successful, an error message will display, providing further information and instructions. Several conditions can cause the entry process to fail in ways that cannot be immediately corrected by the operator. If any of the following conditions are indicated, the entry process will be terminated automatically, and you will have to correct and resubmit the data: (i) internal system problems, (ii) a corrupted WordPerfect input file, (iii) an input file that is not in WordPerfect format, or (iv) an input file that the system cannot parse.

There is one condition that causes the entry process to pause and ask for operator confirmation. If the document type, OITS identifier, or topic in the submitted document file does not match the corresponding information on the *Enter an OITS Record* screen, the system will assume that the wrong file has been submitted. This will cause the system to pause and display an error message, showing the expected versus the submitted document type, OITS identifier, and topic. In some cases, such as when a change occurs in the topic of a document, you may want to verify that the correct document has been selected by checking the OITS identifier number, and then accept the input document file and override the topic in the *Enter an OITS Record* screen information by selecting the *Force Entry* push-button at the bottom of the error message screen. If you do not want to accept the input document file, you may exit from the *Enter an OITS Record* screen by selecting the *Close* push-button at the bottom of the error message screen.

9. To exit from the *Enter an OITS Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Enter* push-button, any information that you have entered will be discarded.

5.7.6 Format Check for New and Updated Regulatory Records

The CDOCS regulatory record processing function has a facility for checking the format of input records prior to submitting them. The format check facility is nearly identical to the entry process described in Section 5.7.4, except that the database is not updated. All input edits are performed and any error conditions are included in a format check error report. The *Format Check* entry screens for regulatory

program and OITS records require the record to be selected from a list view of available records. The input file must be identified either through entry of the full path and file name or through selection with the file chooser facility.

The format check screens for regulatory program records (CDS, CDM, and RPS) differ from those for OITS records. Therefore, the format check processes for regulatory program and OITS records are treated separately.

5.7.6.1 Format Check For Regulatory Program Records

To format check an regulatory program record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Format Check a Regulatory Record* entry from the *Enter a Regulatory Record* cascading menu. Alternatively, you may press the mnemonic key [f] or the accelerator key [^f]. The *Format Check a Regulatory Program Record* entry screen will appear (Figure 5-21).
4. Select the *Document Type* pull-down indicator to display the pull-down list of document types, and select the desired regulatory program document type (e.g., CDS, CDM, or RPS). All of the active and defined review plan numbers and titles for the selected document type will appear in the *Review Plan Number and Title* list view. Note that the information in this list view may be scrolled horizontally and vertically.
5. Select the line in the *Review Plan Number and Title* list view that contains the desired review plan number and title.
6. Select either the *Major Revision* or *Minor Revision* radio button under the *Format Check Type* heading.
7. Enter the appropriate number in the *New Version Number* entry field for the document being format checked. The system will also compute a new version number based on the current version number and the type of change (major or minor). This new computed version number will be compared to the version that you have entered. If they do not match, the system will display an error message, and you will be permitted to: (i) change the version number that you have entered, or (ii) exit from the *Format Check a Regulatory Program Record* entry screen by selecting the *Close* push-button at the bottom of the screen.

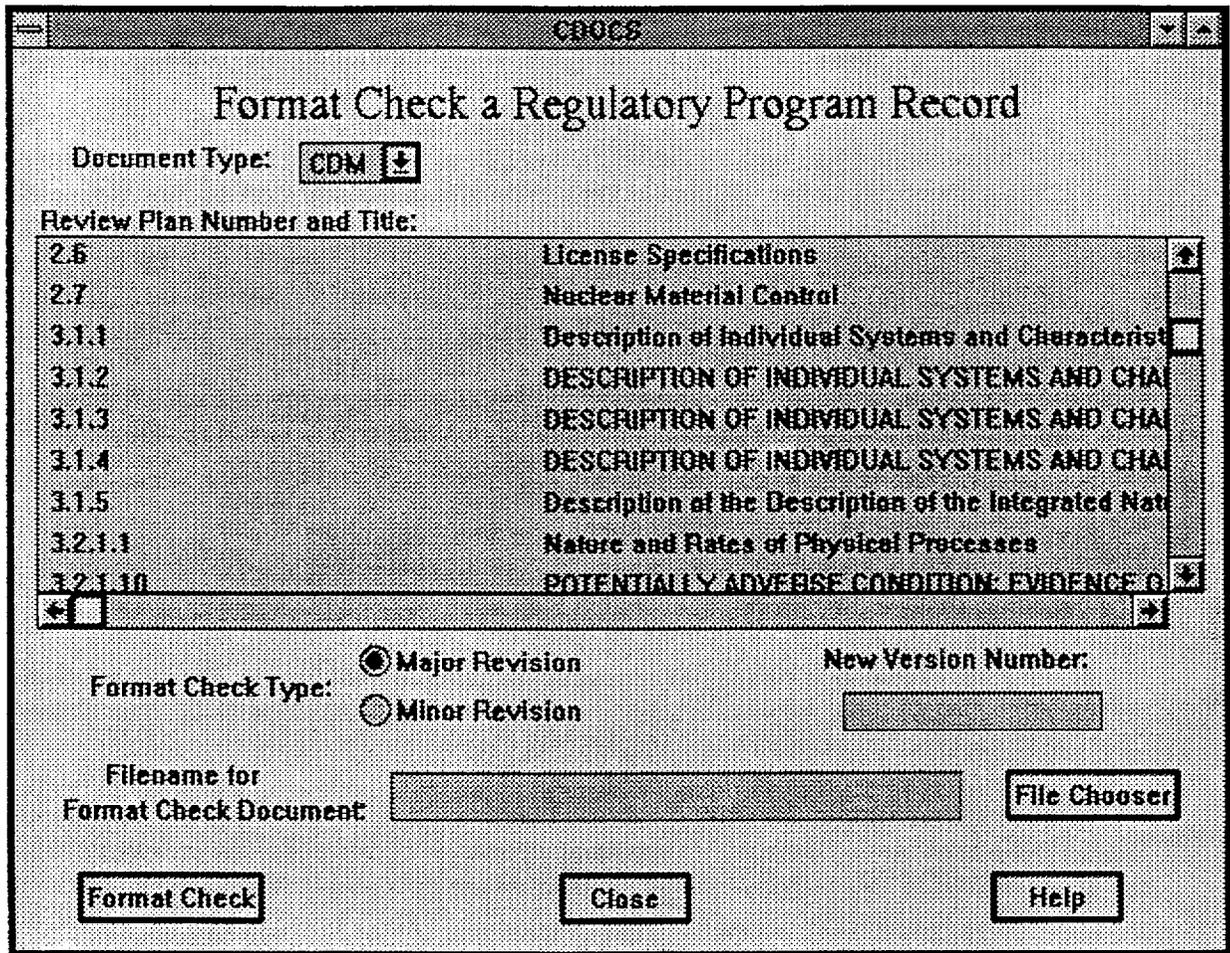


Figure 5-21. Format Check a Regulatory Program Record screen

8. Enter the *Filename for Format Check Document* in the space provided. If you are not sure of the file name, you may select the *File Chooser* push-button next to the *Filename for Format Check Document* entry field. This will cause a list of files to be displayed (Figure 3-7), and you may select the desired disk, directory, and file name.
9. Visually review the information you have entered and make corrections if necessary.
10. When all of the information is correct, select the *Format Check* push-button at the bottom of the *Format Check a Regulatory Program Record* entry screen to accept the format check input information and check the format of the submitted record. A few seconds are required to perform the format check process. During this time, the *Format Check* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the format check process has been completed, the *Format Check*

push-button will return to its normal appearance, and a message will display indicating whether or not the format check was successful.

If, for any reason, the format check was not successful, an error message will display, providing further information and instructions (see Appendix B).

There is one condition that causes the format check process to pause and ask for operator confirmation. If the document type, review plan number, or title in the submitted document file does not match the corresponding information on the *Format Check a Regulatory Program Record* input screen, the system will assume that the wrong file has been submitted. This will cause the system to pause and display an error message, showing the expected versus the submitted document type, review plan number, and title.

11. To exit from the *Format Check a Regulatory Program Record* screen, select the *Close* push-button at the bottom of the screen. If you exit before selecting the *Format Check* push-button, any information that you have entered will be discarded.

5.7.6.2 Format Check for Open Item Tracking System Records

To format check an OITS record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3).
2. Select *Process a Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select the *Format Check a Regulatory Program Record* entry from the *Enter a Regulatory Program Record* cascading menu. Alternatively, you may press the mnemonic key [f]. The *Format Check a Regulatory Program Record* entry screen will appear (Figure 5-21).
4. Select the *Document Type* pull-down indicator to display the pull-down list of document types, and select the OITS. The appearance of the input screen will change to reflect OITS records and all of the active and defined OITS identifiers and topics will appear in the *OITS Identifier and Topic* list view. Note that the information in this list view may be scrolled horizontally and vertically.
5. Select the line in the *OITS ID and Topic* list view that contains the desired OITS identifier and topic.
6. Select the appropriate OITS record.
7. Enter the *Filename for Format Check Document* in the space provided. If you are not sure of the file name, you may select the *File Chooser* push-button next to the *Filename for*

Format Check Document entry field. This will cause a list of files to be displayed (Figure 3-7), and you may select the desired disk, directory, and file name.

8. Visually review the information you have entered and make corrections if necessary.
9. When all of the information is correct, select the *Format Check* push-button at the bottom of the *Format Check an OITS Record* entry screen to accept the format check input information and check the format of the submitted record. A few seconds are required to perform the format check process. During this time, the *Format Check* push-button will remain shaded, and the system will be locked to prevent further entry of information. When the format check process has been completed, the *Format Check* push-button will return to its normal appearance, and a message will display indicating whether or not the format check was successful.

If, for any reason, the format check was not successful, an error message will display, providing further information and instructions (see Appendix B).

10. To exit from the *Format Check an OITS Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Format Check* push-button, any information that you have entered will be discarded.

5.7.7 Retire Regulatory Program Records

A regulatory program record may become obsolete and may need to be removed from the active database. The record retirement process is used to archive an outdated regulatory program record and remove it from the active database. The information in the retired record is physically retained, but is no longer available to users through the normal access methods. The record to be retired must be positively identified through the *Retire a Regulatory Program Record* screen (Figure 5-22) before it can be archived and removed from the active database. Such action must be approved by NRC and CNWRA management and must be done in accordance with TOP-001-015, RPD Loading, Control, Version Control, and Change Control (Center for Nuclear Waste Regulatory Analyses, 1993) for regulatory program records.

5.7.7.1 Retire a Regulatory Program Record

To retire a regulatory program record:

1. Select *Custodian* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu containing options to *Submit Record*, *Update Record*, *Delete Record*, and *Process a Regulatory Record* (Figure 5-3)
2. Select *Process Regulatory Record* from the *Custodian* pull-down menu. The system displays a cascading menu containing options to *Define a Regulatory Record*, *Retire a Regulatory Record*, *Format Check a Regulatory Record*, and *Enter a Regulatory Record* (Figure 5-14).
3. Select *Retire a Regulatory Record* from the *Process a Regulatory Record* cascading menu.

Alternatively, you may press the mnemonic key [f] or the accelerator key [^f]. The *Retire a Regulatory Program Record* entry screen will appear (Figure 5-22). Select the *Document Type* pull-down indicator to display the pull-down list of document types, and select the desired regulatory program document type (e.g., CDS, CDM, or RPS). All of the active and defined review plan numbers and titles for the selected document type will appear in the *Review Plan Number and Title* list view. Note that the information in this list view may be scrolled horizontally and vertically.

4. Select the line in the *Review Plan Number and Title* list view that contains the desired review plan number and title..

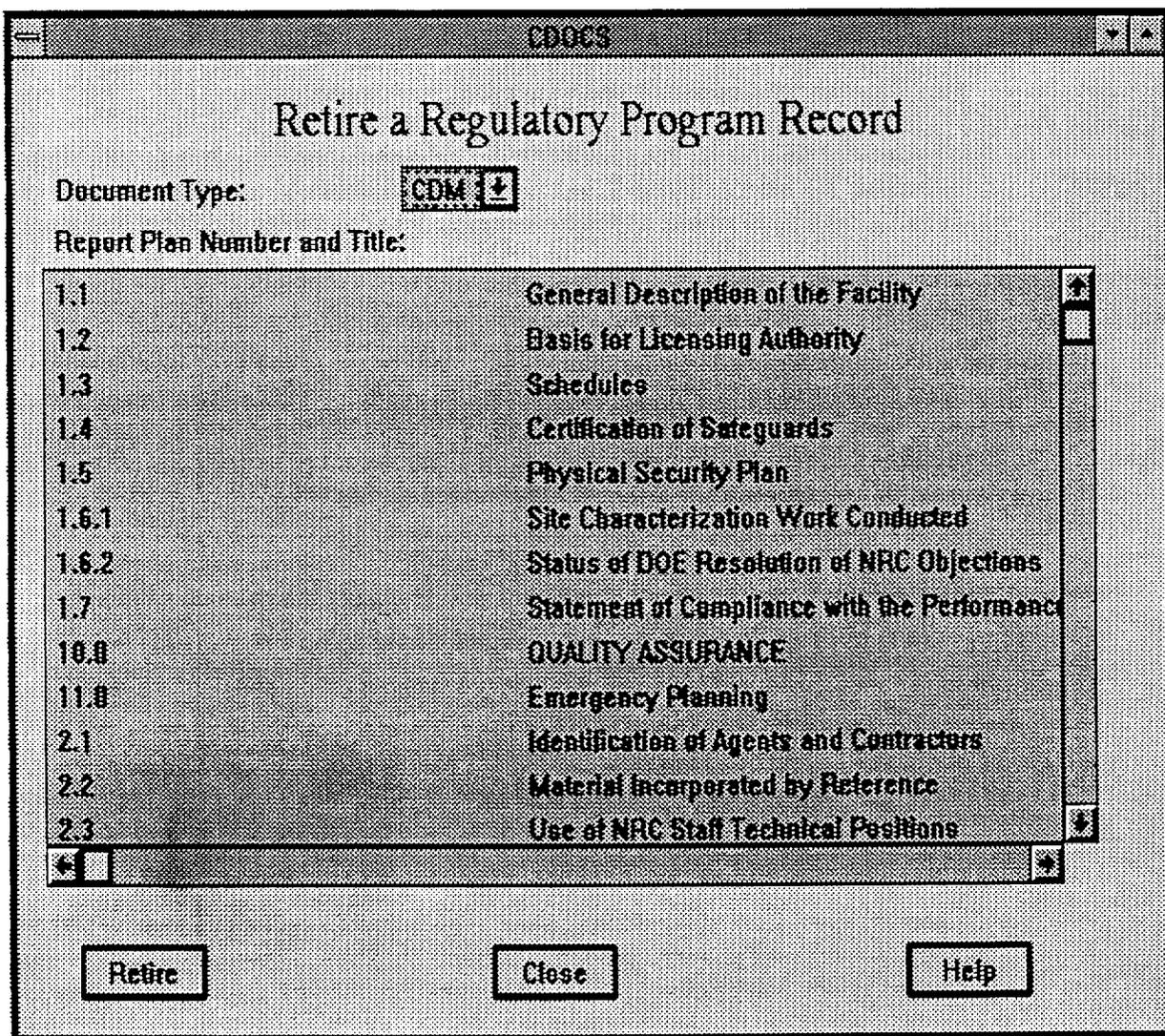


Figure 5-22. Retire a Regulatory Program Record screen

5. When you have selected the record to be retired, select the *Retire* push-button at the bottom of the *Retire a Regulatory Program Record* screen. The system will display a confirmation message and ask you to verify that the correct record has been selected. You may continue with the record retirement by selecting the *Retire* push-button in the message window.
6. If the wrong record has been selected, or if you do not want to continue with the record retirement, you may exit from the *Retire a Regulatory Program Record* screen by selecting the *Close* push-button at the bottom of the screen.

When a record has been retired, a message will appear at the bottom of the screen informing you that the record retirement transaction successfully completed.

7. To exit from the *Retire a Regulatory Program Record* screen, select the *Close* push-button at the bottom of the screen. If you select the *Close* push-button to exit before selecting the *Retire* push-button, the record that you were starting to retire will remain in the active database.

5.8 CUSTODIAN FUNCTIONS FOR LIBRARY CONTROL

The CNWRA maintains a library of selected documents. CDOCS performs additional functions at the CNWRA associated with circulation control of these documents. The CDOCS circulation control facilities are not needed at the NRC, therefore, the circulation control options do not appear on the NRC *Custodian* pull-down menu (Figure 5-3).

5.8.1 Checking Out a Consolidated Document System Record

CDOCS provides facilities for circulation control of hard-copy documents associated with certain document sets. The circulation control facilities permit a document to be checked out from the CNWRA library.

To check out a record from CDOCS:

1. If the *CDOCS Checkout* entry screen (Figure 5-23) is not visible, select *Checkout Document* from the CNWRA *Custodian* pull-down menu in the *CDOCS Main Menu* (Figure 5-4).

The *CDOCS Checkout* entry screen appears (Figure 5-23) and the *Document Set* drop-down list is initialized to the default document set.

2. Enter the number of the document to be checked out in the *Document Number* entry field.
3. Select the staff member's name from the *Selection List*. If the name is not in the *Selection List*, then enter it in the *Other Names* field. The name should be entered as last name followed by a comma, first and middle initials, each followed by a period.

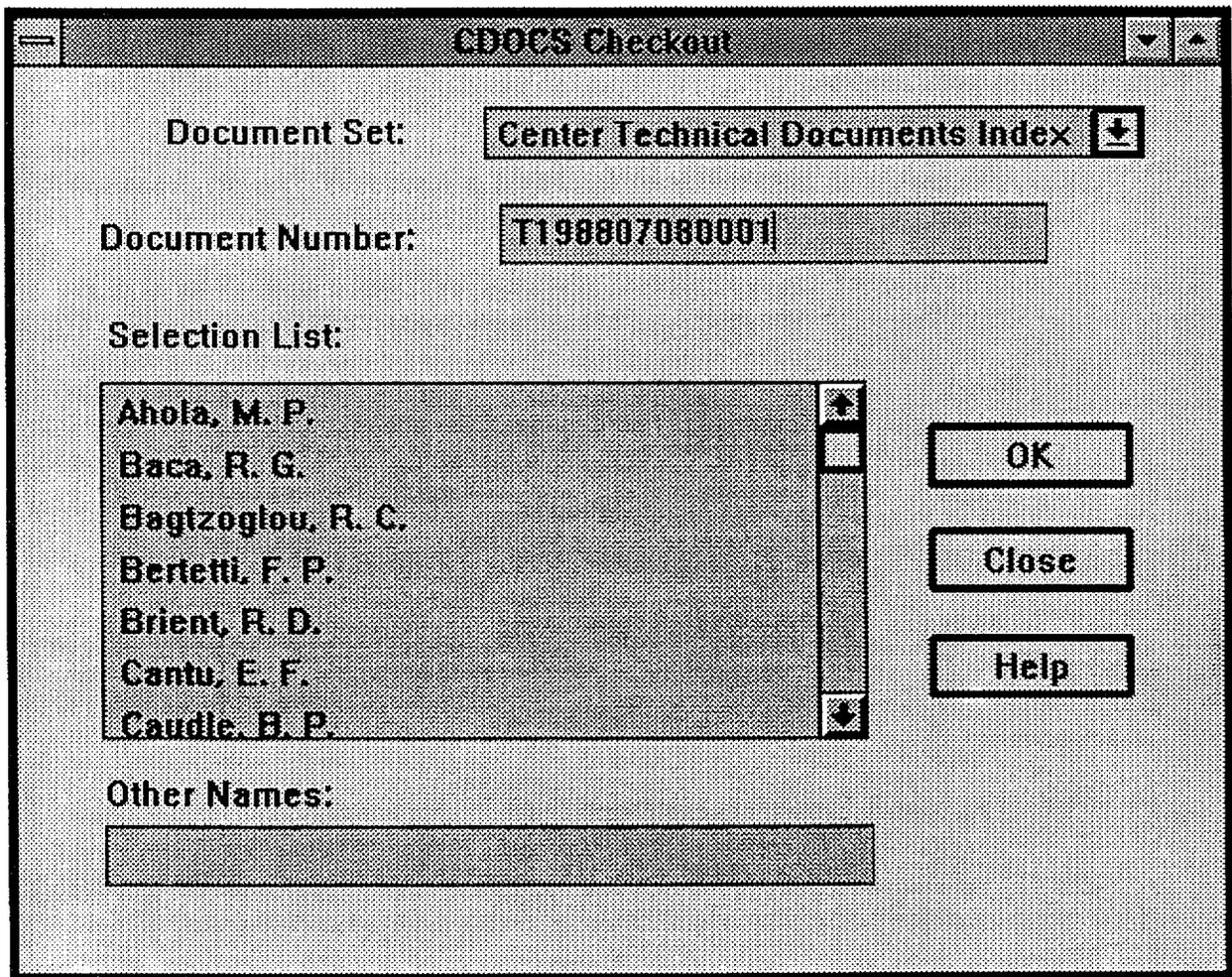


Figure 5-23. CDOCS Checkout entry screen

4. Select the *OK* push-button at the right of the screen to check out the record.
5. The check out process validates the document number that was entered. If an invalid document number was entered, an error message appears prompting reentry of the document number. If the document is already checked out to someone else, an error message is displayed, and prompts for reentry of the document number again. If the document number is valid and the document is not already checked out, the document check out process displays an advisory message, including the title of the record being checked out, to indicate that the checkout process was completed successfully.
6. To exit the *CDOCS Checkout* entry screen, select the *Close* push-button at the right of the screen.

If the *Close* push-button is selected before selecting the *OK* push-button, the record is not checked out.

5.8.2 Checking In a Consolidated Document System Record

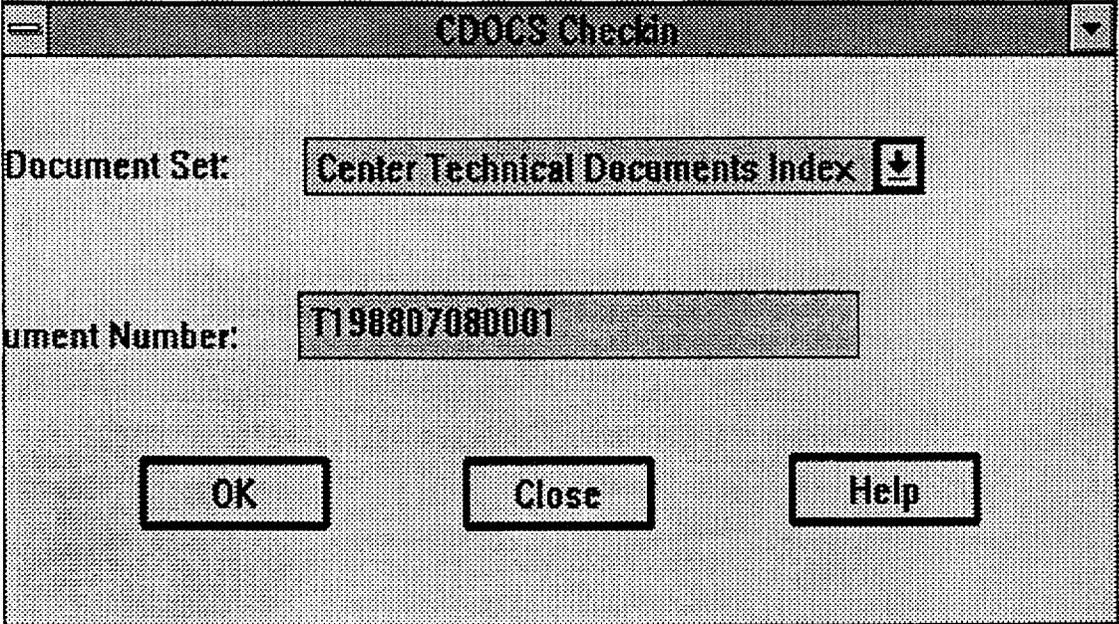
CDOCS provides facilities for circulation control of hard-copy documents associated with certain document sets. The circulation control facilities permit the document to be checked in when the document is returned to the CNWRA library.

To check in a CDOCS record:

1. If the *CDOCS Checkin* entry screen (Figure 5-24) is not visible, select *Checkin Document* from the CNWRA *Custodian* pull-down menu in the *CDOCS Main Menu* (Figure 5-3).

The *CDOCS Checkin* entry screen appears and the *Document Set* drop-down list is initialized to the default document set.

2. Enter the document number in the *Document Number* entry field.
3. Select the *OK* push-button at the right of the screen to check in the record (Figure 5-24).



The screenshot shows a graphical user interface window titled "CDOCS Checkin". The window contains the following elements:

- A "Document Set:" label followed by a dropdown menu showing "Center Technical Documents Index" with a downward arrow.
- A "Document Number:" label followed by a text input field containing the alphanumeric string "T198807080001".
- Three rectangular buttons at the bottom: "OK", "Close", and "Help".

Figure 5-24. CDOCS Checkin entry screen

The checkin process validates the document number that was entered. If an invalid document number is entered, an error message appears prompting reentry of the document number again. If the document is not checked out to someone, an error message is displayed and prompts for reentry of the document number again. If the document number is valid and the document is currently checked out, the document check-in process displays a confirmation screen including the title of the record being checked in. Select *OK* to check in the record. The system displays an advisory message to indicate that the check-in process has completed successfully.

4. To exit the *Document Checkin* entry screen, select the *Close* push-button at the right of the screen. If the *Close* push-button is selected before selecting the *OK* push-button, the record is not checked in.

5.9 MAIN MENU—REPORT ENTRY

CDOCS custodians have access to the standard reference and database status reports and new acquisition reports. For further information on how to select, view, and print CDOCS reference reports, database statistics reports, and new acquisition reports, see Section 3.9.

The availability of reports depends on the users authorities and permissions. Reports that the custodians are authorized to access appear on the *Report* pull-down menu (Figure 5-25).

In addition to the standard reference reports, database status reports, and new acquisition reports, custodians also have access to the following additional CDOCS reports:

Circulation—Circulation status for hard-copy documents in the CNWRA library.

Labels—Labels to be affixed to hard copy documents (books, reports, etc.) to assist in document tracking.)

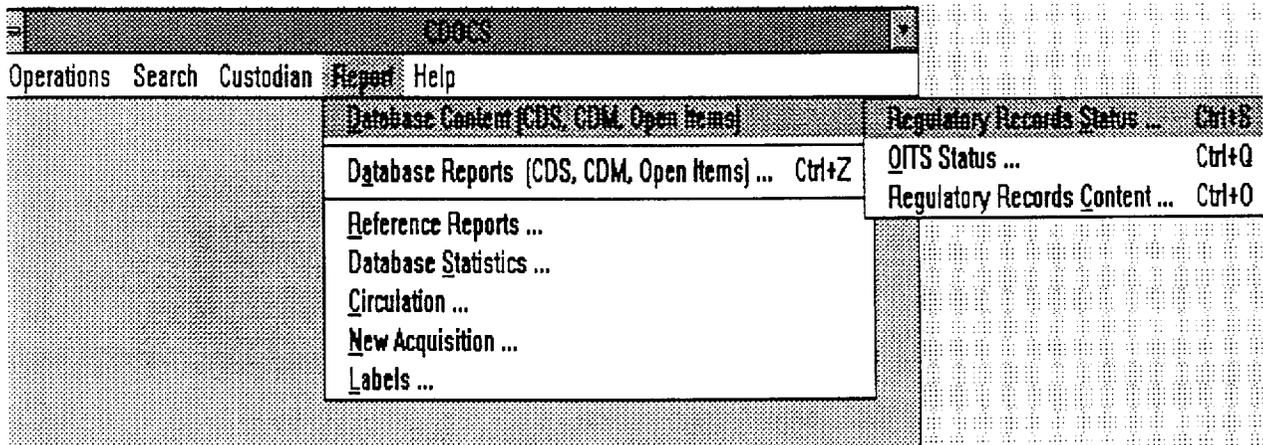


Figure 5-25. Report pull-down menu for database custodians

5.9.1 Report Menu—Circulation Reports

The CDOCS circulation reports comprise a suite of related reports that assist in locating physical documents. The specific circulation reports are accessed through the *CDOCS Circulation Reports* screen (Figure 5-26).

To use the CDOCS circulation reports:

1. Select *Reports* from the *CDOCS Main Menu* (Figure 5-3). The *Report* pull-down menu is displayed (Figure 5-25).

CDOCS Circulation Reports

Document type: **Center Technical Documents Index**

Current Checkouts

Who has a certain document...

Retrieve all documents checked out by a certain person...

Selection List:

- Ahola, M. P.
- Baca, R. G.
- Bagtzoglou, R. C.
- Bertetti, F. P.
- Briant, R. D.
- Cantu, E. F.

Other Names:

OK

Close

Help

Figure 5-26. CDOCS Circulation Report selection screen

2. Select *Circulation* from the *Report* pull-down menu. The *CDOCS Circulation Reports* selection screen is displayed (Figure 5-26).
3. Select the radio button for the desired type of report.
4. If the radio button for *Who has a certain document* was selected, enter the document number in the corresponding entry field.
5. If the radio button for *Retrieve all documents checked out by a certain person* was selected, select the person's name from the selection list, or enter the name in the *Other Name* field.
6. Select the *OK* push-button to execute the report.
7. Select the *Print* push-button to print the report.
8. Select the *Close* push-button to exit from the *CDOCS Circulation Reports* selection screen.

5.9.2 Accessing the Consolidated Document Management System Labels

These labels are affixed to hard copy documents (books, reports, etc.) to assist in document tracking.

To use the CDOCS labels function:

1. Select *Reports* from the *CDOCS Main Menu* (Figure 5-3). The *Report* pull-down menu is displayed (Figure 5-25).
2. Select *Labels* from the *Report* pull-down menu. The *Labels Report* selection screen is displayed.
3. Select *Print* to print the labels.

5.10 MAIN MENU—HELP ENTRY

For information about how to use the *Help* facility, see Section 3.10.

6 DATABASE ADMINISTRATOR GUIDELINES

The previous chapters provided a general introduction to CDOCS and its primary functions and described the functions available to most CDOCS users and the database custodian. This chapter introduces the functions available to the CDOCS database administrator.

6.1 DATABASE ADMINISTRATOR AUTHORITIES AND PERMISSIONS

This chapter discusses authorities, permissions, and functions available to the database administrator. Where functions available to the database administrator are the same as those available to other CDOCS users, reference is made to prior sections of the *User's Guide*. Familiarity with the CDOCS primary functions presented in previous sections prepares the administrator to operate CDOCS and utilize these additional functions. The database administrator has extensive authorities and permissions to access all functions of other CDOCS users as well as to the exclusive abilities to add new users to the system and to alter user permissions and preferences.

6.2 CONSOLIDATED DOCUMENT SYSTEM MAIN MENU

After the logon process has been completed, the system displays the *CDOCS Main Menu* for the database administrator (Figure 6-1). This screen contains a menu bar at the top of the screen with the following major functions that can be accessed by the database administrator:

Operations—Copy a regulatory program or OITS record, use WordPerfect to edit a regulatory program or OITS record, change passwords (for CNWRA users), or exit from CDOCS

Search—Use information searches to find and access CDOCS records

Custodian—Perform operations to submit, delete, check out, or check in CDOCS records

Report—Access CDOCS report facilities to display and/or print standard reports

System—Use system maintenance functions

Help—Access CDOCS help facilities to get more information about how to use CDOCS

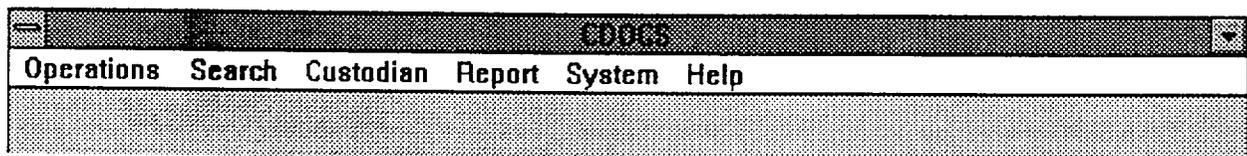


Figure 6-1. CDOCS main menu for database administrator

6.3 MAIN MENU—OPERATIONS ENTRY

The *Operations* entry in the menu bar of the *CDOCS Main Menu* permits performance of general functions that are available to all users. Selecting *Operations* from the menu bar of the *CDOCS Main Menu* causes the *Operations* pull-down menu to appear (Figure 6-3). The *Operations* pull-down menu includes options for (i) copying a regulatory program or OITS record, (ii) using WordPerfect to edit a regulatory program or OITS record, (iii) changing passwords (for CNWRA users), (iv) setting user preferences, (v) scan and optical character recognition, or (vi) exiting CDOCS. For further information about how to use the *Operations* entry in the *CDOCS Main Menu*, see Section 3.7; for further information on Password Logon, see Appendix A.

6.4 MAIN MENU—SEARCH ENTRY

CDOCS provides powerful and easy-to-use facilities for identifying and viewing records. The TOPIC search and retrieval software permits the user to find records by searching for specific words or phrases in: (i) the text of the document, and/or (ii) certain document header fields, such as the author or title. For further information about how to use the *Search* entry in the menu bar of the *CDOCS Main Menu*, see Section 3.8

6.5 MAIN MENU—CUSTODIAN ENTRY

The database administrator has permissions and authorities that permit maintenance of CDOCS records. The record maintenance capabilities available through the *Custodian* pull-down from the *CDOCS Main Menu* include submitting, deleting, checking in and checking out CDOCS records, and maintaining regulatory records. These functions are fully described in Chapter 5.

6.6 MAIN MENU—REPORT ENTRY

The availability of reports depends upon the authority and permissions of the individual user. Reports that are authorized for a particular user appear on the *Report* menu. The database administrator has unique reporting capabilities (Figure 6-4). For further information on how to select and print database content reports, see Section 3.9.

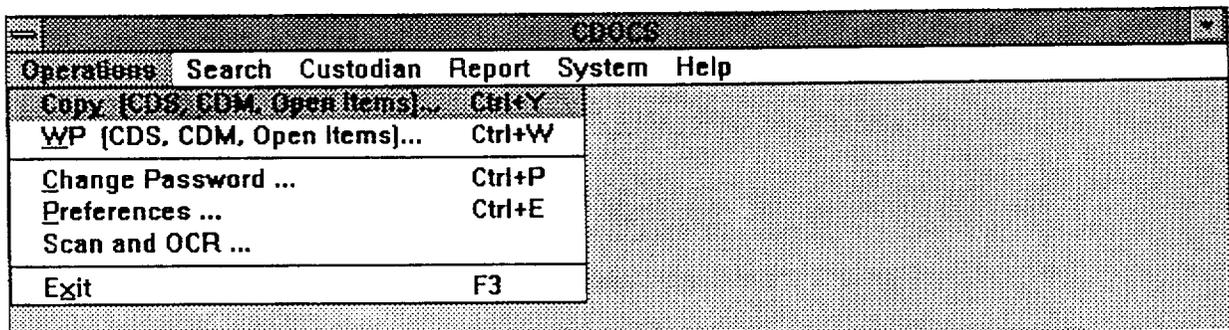


Figure 6-2. CDOCS Database administrator operations pull-down menu

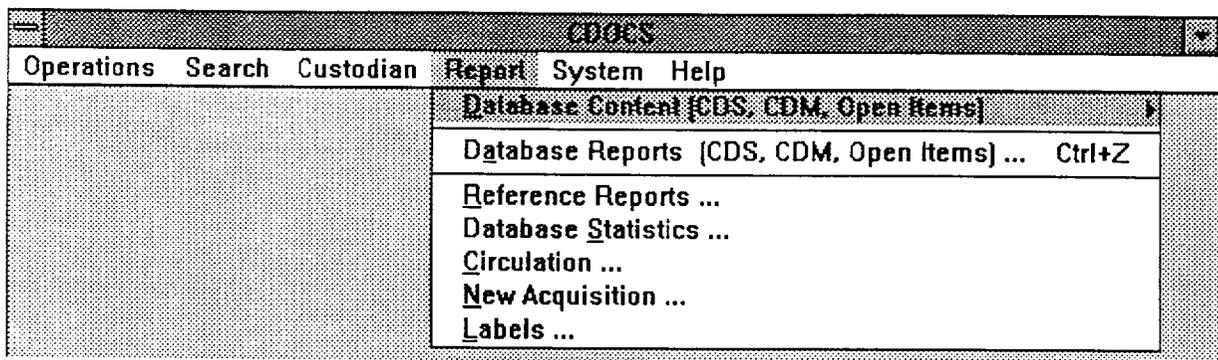


Figure 6-3. Report pull-down menu for database administrators

To view database administrator reports:

1. Select *Report* from the menu bar of the *CDOCS* Main Menu. The system displays a pull-down menu of report types (Figure 6-3).
2. Select *Database Content* from the *Report* pull-down menu. The system displays a cascading menu (Figure 6-4).
3. The DB Dump and DBA reports, which appear on the menu, provide detailed information on the database development, and may be selected for viewing or printing as required.

6.7 MAIN MENU—SYSTEM ENTRY

The *System* main menu entry permits the database administrator to perform maintenance on the list of authorized users of the system. This facility permits users to be added, deleted, or changed.

Adding a New User ID

To add a CDOCS User ID:

1. Select *System* from the menu bar of the *CDOCS* Main Menu. The system displays a pull-down menu that contains the *User IDs* entry (Figure 6-5)
2. Select the *User IDs* entry in the *System* pull-down menu. The *CDOCS User ID Maintenance* screen (Figure 6-6) appears
3. Enter the user identification number in the *User ID* entry field.
4. Enter the password in the *Password* entry field. The password that is entered in this field is the initial password for the user.

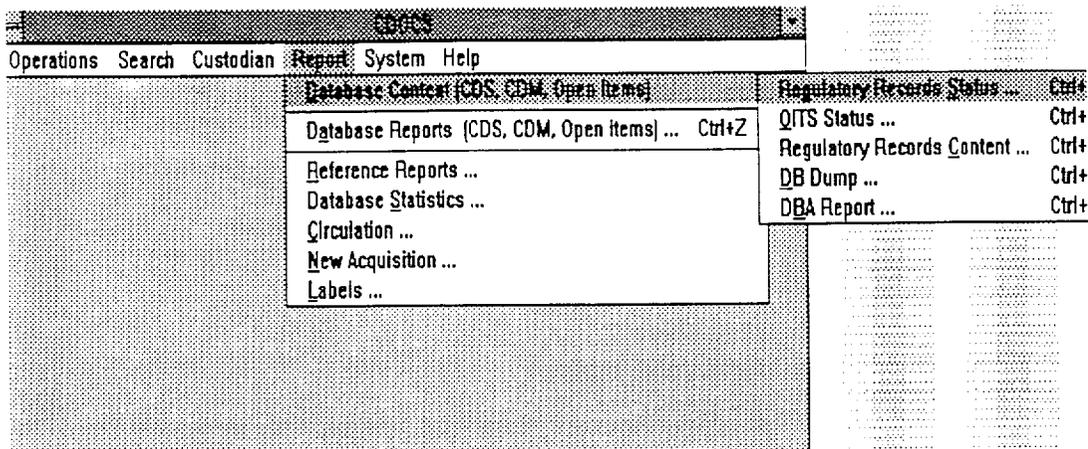


Figure 6-4. Database Content cascading menu

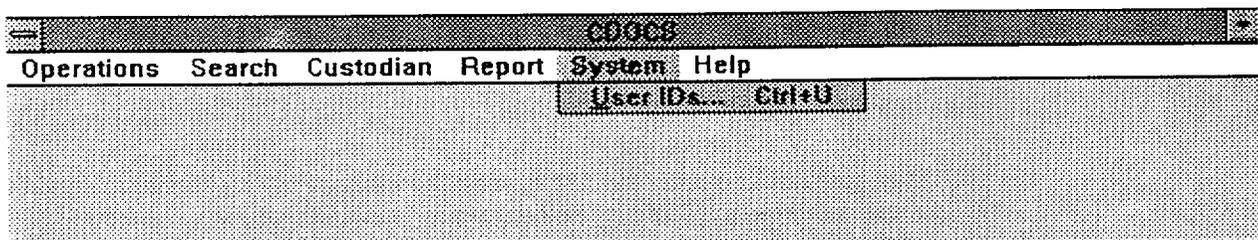


Figure 6-5. CDOCS system pull-down menu

5. Enter the name of the user in the *Username* entry field.
6. Select the desired privilege from the *Privilege* drop-down list.
7. Review the information that has been entered and make corrections if necessary. When all of the information is correct, select the *Add* push-button at the bottom of the *User ID Maintenance* screen to add the new User ID.
8. To exit from the CDOCS *User ID Maintenance* screen, select the *Close* push-button at the bottom of the screen. If this screen is exited before selecting the *Add* push-button, any information that was entered is discarded, and the new *User ID* is not added.

6.7.1 Deleting a User ID

To delete a CDOCS User ID:

1. Select *System* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu that contains the *User IDs* entry (Figure 6-5).

2. Select the *User IDs* entry in the *System* pull-down menu. The *CDOCS User ID Maintenance* screen (Figure 6-6) appears.
3. Select the *User ID* to be deleted from the scrollable list view of User IDs and privileges.
4. Review the selected User ID, and select a different User ID if necessary. When the correct User ID has been selected, select the *Delete* push-button at the bottom of the *User ID Maintenance* screen to delete the User ID.
5. To exit from the *CDOCS User-ID Maintenance* screen, select the *Close* push-button at the bottom of the screen. If this screen is exited before selecting the *Delete* push-button, the User ID that was to be deleted remains valid.

6.7.2 Changing User Privileges

The following steps are required to change the privileges of a CDOCS User ID:

1. Select *System* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu that contains the *User IDs* entry(Figure 6-5). .

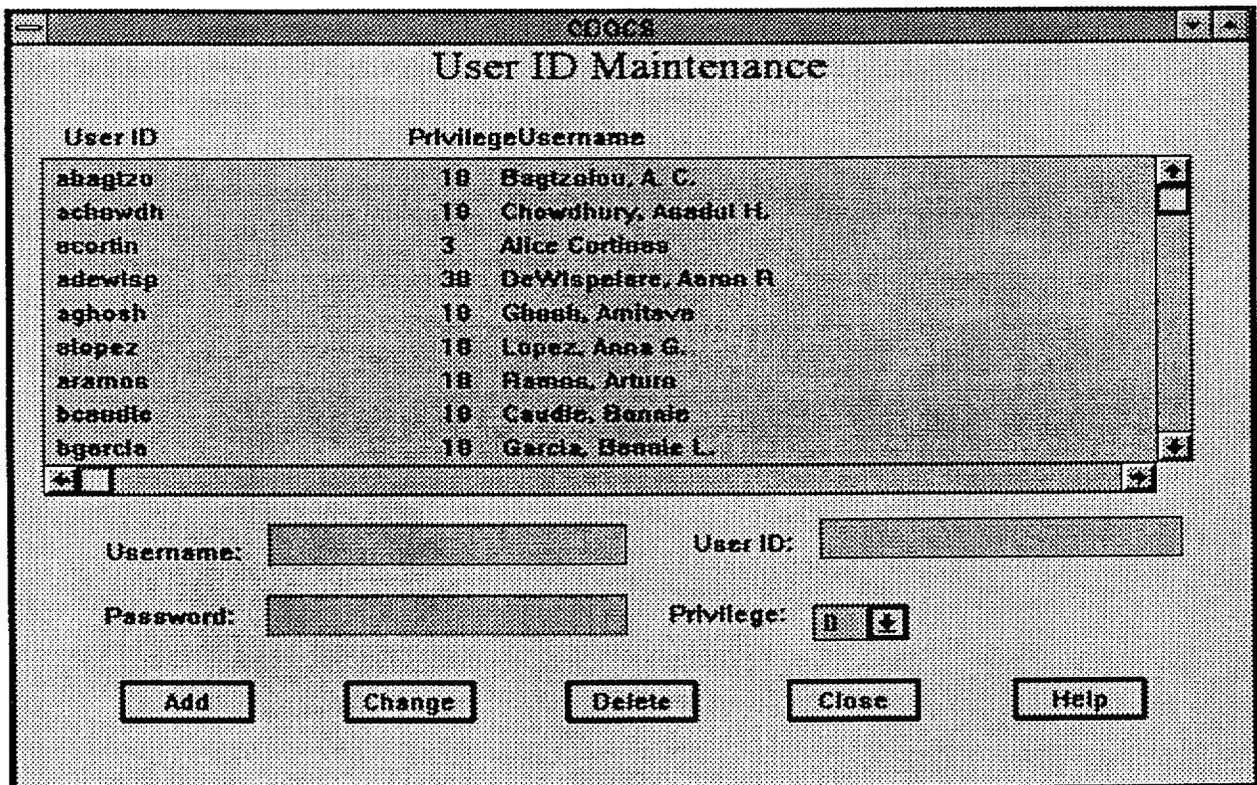


Figure 6-6. CDOCS User ID Maintenance screen

2. Select the *User IDs* entry in the *System* pull-down menu. The *CDOCS User ID Maintenance* screen (Figure 6-6) appears.
3. Select the User ID of the privilege to be changed from the scrollable list of User IDs.
4. Review the selected User ID, and select a different User ID if necessary.
5. Select the *Privilege* push-button to view the *Privilege* drop-down lists. Privileges are as follows:
 - 0—NRC User
 - 1—NRC Custodian
 - 2—CNWRA User
 - 3—CNWRA Custodian
 - 60—Database Administrator
7. Select the *Change* push-button at the bottom of the *User ID Maintenance* screen to change the user's privileges.
8. To exit from the *CDOCS User ID Maintenance* screen, select the *Close* push-button at the bottom of the screen. If this screen is exited before selecting the *Change* push-button, the privileges and password for the User ID is not changed.

6.8 MAIN MENU—HELP ENTRY

For information about how to use the help facility, see Section 3-10.

7 REFERENCES

- Center for Nuclear Waste Regulatory Analyses. 1993. *Technical Operating Procedure (TOP-001-015)*. San Antonio, TX: Center for Nuclear Waste Regulatory Analyses.
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APPENDIX A
PASSWORD LOGON

A PASSWORD LOGON

A.1 OVERVIEW

When CDOCS is started for a CNWRA user, the first screen displayed is the *Logon* screen (Figure A-1). This screen requires entry of an User ID and password so the system can identify the user and enable the appropriate access authorities and permissions.

A.2 LOGON PROCEDURE

The following steps are required during the logon process:

1. When the *CDOCS Logon* screen appears, enter User ID in the *User ID* entry field and press the [Tab] key or use the mouse to select the *Password* entry field.

Note: The *User ID* field is case sensitive and must be keyed in exactly. For example: The User ID "User:" During logon, a capital "U" followed by lower case "ser" (User) must be entered. If any variation, such as "user" or "USER" are entered, the logon will not be successful.

2. Enter current password in the *Password* entry field, and press the [Return] or [Enter] key or select the *Logon* push-button at the bottom of the screen. Note, for security reasons, the password does not display as it is entered.

The system verifies the User ID and password. If they are valid, the *CDOCS Main Menu* screen displays (Figure 3-3) indicating a successful logon has been completed.

If the User ID or password is not valid, the system displays an error message, and requests re-entry of the User ID and password.

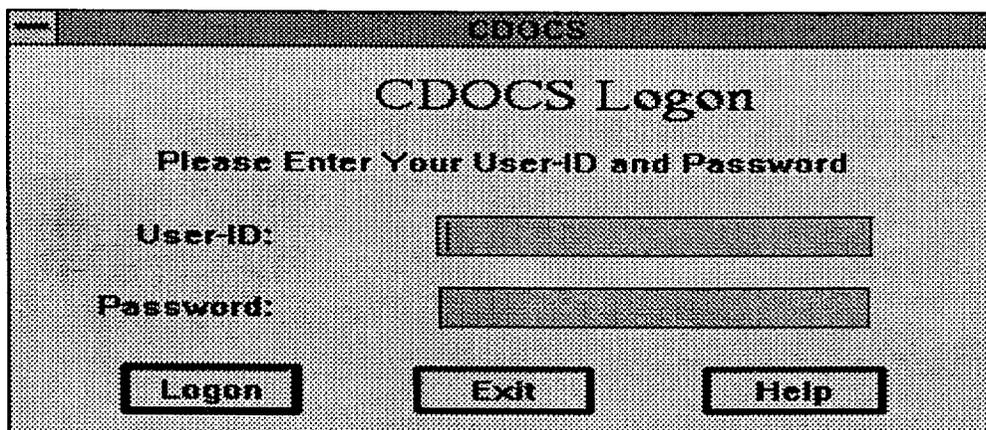


Figure A-1. CDOCS Logon screen

3. If the User ID and password cannot be entered correctly, exit from CDOCS by selecting the *Exit* push-button at the bottom of the *CDOCS Logon* screen or by pressing the [Esc] key. For logon assistance, contact the Center for Nuclear Waste Regulatory Analyses (CNWRA) IMS staff at (210) 522-5258, or the NRC System Administrator at (301) 415-8087.

If help is needed during the logon procedure, select the *Help* push-button at the bottom of the *CDOCS Logon* screen to display the help information.

A.3 OPERATIONS—CHANGING PASSWORD

Before a CNWRA user first uses the CDOCS, the CNWRA IMS staff assigns an arbitrary password to the user. This password should be changed the first time the user logs on to the system to make the User ID secure. For continued User ID security, the user should change passwords at least every 60 days. The system permits users with the appropriate security class to change their password at any time through the *Operations* entry in the menu bar of the *CDOCS Main Menu*.

To change password:

1. Select *Operations* from the menu bar of the *CDOCS Main Menu*. The system displays a pull-down menu (Figure Figure A-2) that contains options for changing password or exiting the CDOCS.
2. Select *C*hange Password from the *Operations* pull-down menu. Alternatively, the mnemonic [c] may be typed or the accelerator key [Ctrl+P] pressed. The system displays the *Change Password* screen (Figure A-3).

The *Change Password* screen may be exited before the password has been changed by selecting the *Close* push-button at the bottom of the screen. If this option is selected, the system terminates the change password process and leaves the old password in effect.

3. Enter the new password in the *New password* entry field and press the [Tab] key or use the mouse to select the *Reenter new password* entry field.

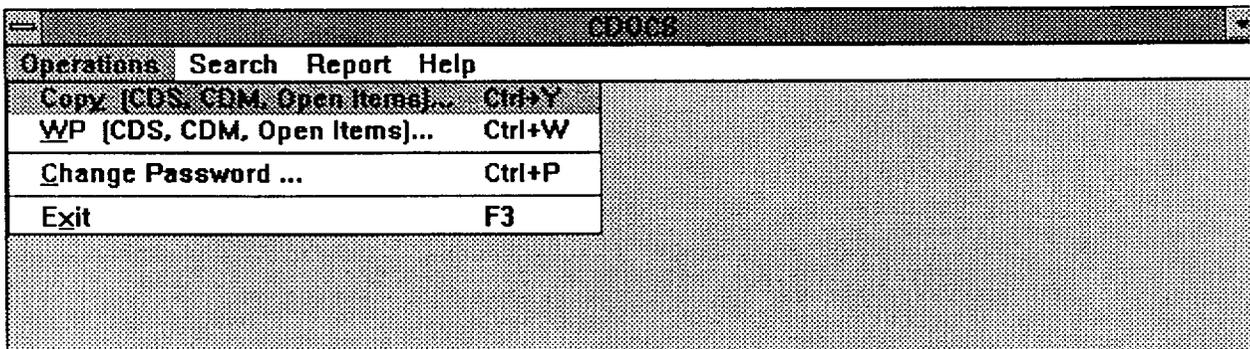


Figure A-2. Operations pull-down menu

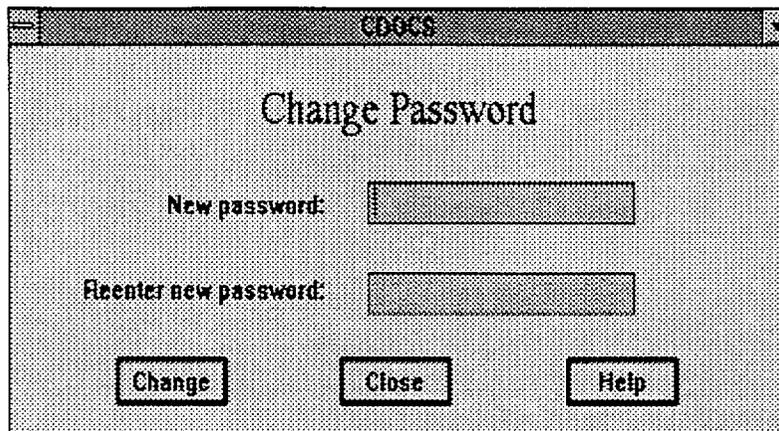


Figure A-3. CDOCS Change Password screen

4. Enter the new password again in the *Reenter new password* entry field to verify that it was keyed in correctly, and either press the [Return] or [Enter] key or select the *Change* push-button at the bottom of the *Change Password* screen. Note, for security reasons, the password does not display as it is entered.

If the new password was the same both times it was entered, the system changes the current password to the new password and a PASSWORD CHANGED message displays. Otherwise an error message is displayed asking for re-entry of the new password again.

5. When the password has been changed, select the *Close* push-button at the bottom of the *Change Password* screen to exit from the change password process. At this point, the new password is in effect. Subsequent logons will require entry of the assigned User ID and the new password.

To obtain help during the change password procedure, select the *Help* push-button at the bottom of the *Change Password* screen to display help information

APPENDIX B

ERROR MESSAGES

B ERROR MESSAGES

Custodian/administrator assistance is available at the following phone numbers:

- NRC System Administrator (310) 415-8087(8:00 am - 5:00 pm, EST)
- CNWRA Help Desk (210) 522-5258(8:00 am - 5:00 pm, CST)

ERROR MESSAGE	ERROR INFORMATION/USER ACTION
Bad working directory.	Server cannot change to proper directory. Contact the database custodian/administrator and report the error message.
Can not check out document.	Verify the correct document number was entered and the correct document set was specified. Check to determine if the document is already checked out. If the problem persists, contact the database custodian/administrator and report the error message.
Can not delete deleted document.	The document specified for deletion has already been deleted. Verify correct document number was entered and the correct document set selected. If the problem persists, contact the database custodian/administrator and report the error message.
Can not delete document.	Verify the correct document number was entered and the correct document set selected. Check to determine if the document is checked out. If the problem persist after verifying that the information entered is correct, and that the document is not checked out, then contact the database custodian/administrator and report the error message.
Check in error.	Verify the correct document number was entered and the correct document set selected. Check to determine if the document is checked out. If the problem persists after verifying that the information entered is correct and that the document is checked out, then, contact the database custodian/administrator and report the error message.
Client file error (%Id).	Cannot save file to local disk. (i) Use the owner account (permissions). (ii) Clean off the disk.
Client Memory Error.	Client out of memory. Close some applications.
Could not write document.	Contact the database custodian/administrator and report the error message.

ERROR MESSAGE	ERROR INFORMATION/USER ACTION
Document already checked in.	The document specified for check in is already checked in. Verify the correct document number was entered and the correct document set specified.
Document already checked out.	The document specified for check out is already checked out. Verify the correct document number was entered and the correct document set specified. This message can be overridden to check out multiple copies of a document. See Section 6.5.16.
Document synchronization failed	Retry the operation. If the problem reoccurs, verify that the server is up and functioning. If the network connection is up and functioning, and the problem persists, contact the database custodian/administrator and report the error message.
Error connecting to server.	Server is not functioning. Contact the database custodian/administrator and report the error message.
Input Data Too Long.	Input data too long for field(s). Re-enter abbreviated form of data.
Invalid Document Type.	Unknown document type passed to server. Contact the database custodian/administrator and report the error message.
Invalid logon name/password.	Server could not verify User-ID or password. Logon using the correct User-ID and password
New password does not match the re-entered new password.	When attempting to change the user's password, there was a password mismatch between the password and the re-entered password. Select OK to dismiss the error message and then re-enter the new password twice to verify its correctness.
No more records.	Contact the database custodian/administrator and report the error message.
NULL password entered.	When attempting to change the user's password, the RETURN key was pressed or the CHANGE button was selected when the Re-enter new password field was empty. Select the OK button to dismiss the error message and then re-enter the new password twice to verify its correctness.
Password must be at least 4 characters.	The password entered is less than the minimum 4 characters, Re-enter a password with a minimum of 4 characters.

ERROR MESSAGE	ERROR INFORMATION/USER ACTION
Password must be no longer than 16 characters.	The password entered is longer than the maximum 16 characters. Re-enter a password with less than 16 characters.
RPC Call timed out.	System error. Contact the database custodian/administrator and report the error message.
Server File Error (%Id).	Cannot read/write file. Contact the database custodian/administrator and report the error message.
Server list data error.	Contact the database custodian/administrator and report the error message.
Server Memory Error.	Server out of memory. Contact the database custodian/administrator and report the error message.
SQL Error (%Id).	System error. Improper installation. Contact the database custodian/administrator and report the error message.
Unable to find ipc.dll	Contact the database custodian/administrator and report the error message.
Unknown Server Error.	Contact the database custodian/administrator and report the error message.
Version Error	Installation problem. Contact the database custodian/administrator and report the error message.
You entered an invalid User-ID or password.	When logging on, an incorrect User-ID and/or password was entered. Re-enter the User-ID and password.
You MUST enter both a User-ID and password.	When logging on, either the User-ID or password was not entered. Try again, using both the User-ID and password.

APPENDIX C

ScanWorX—SCANNING, OPTICAL CHARACTER RECOGNITION, AND DOCUMENT CLEANUP

C ScanWorX—SCANNING, OPTICAL CHARACTER RECOGNITION, AND DOCUMENT CLEANUP

C.1 OVERVIEW

The scanning, Optical Character Recognition (OCR), and document cleanup processes involve several distinct steps.

- The document is examined to determine if exception conditions must be accommodated.
- A new or existing document is specified and the system assigns a job name.
- A user-supplied document name is entered and options for text and full-page images are selected.
- The pages are placed in the document feeder, or on the scanner bed, and scanned.
- Pages are zoned as required to designate areas of text versus areas that contain images.
- Pages of text are accessed through a special editor to correct scanning/OCR errors.
- The corrected text is exported to the file system, along with any associated images, for loading into the full-text and image databases.

C.2 STARTING THE SCANNING OPERATION

The scanning process is initiated from the *SCAN and OCR* entry in the *Operations* pull-down menu (Figure C-1) on scan capable workstations. If the workstation is not scan-capable (does not have the appropriate scanner and software installed) this option does not appear.

To start the scan operation:

1. Select the *Operations* entry from the *CDOCS Main Menu*.
2. The *Operations* pull-down menu appears.
3. Select the *SCAN and OCR* entry in the *Operations* pull-down menu, and the scanning facilities is started.

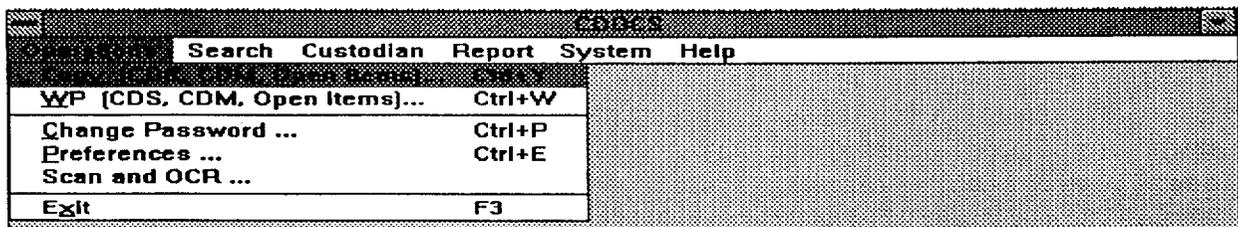


Figure C-1. CDOCS—Operations pull-down menu

C.3 ScanWorX CONTROL WINDOWS

The following sections provide an overview of the screens used to control the ScanWorX scanning process. Sample screens (windows) are shown with instructions for accessing the window and brief descriptions of option selections. The windows overviewed in this section are:

Main window (Section C3.1):

- *General Help* window
- *Pause* window
- *Document Settings* window (Section C3.2)
- *Scanner Settings* window (Section C3.3)
- *Start Processing* window (Section C3.4)
- *Text Format* pop-up window (Section C3.4.2)
- *Image Format* pop-up window (Section C3.4.3)
- *Text Options* pop-up window (Section C3.4.4)

C.3.1 Main Window

The ScanWorX main window is illustrated in Figure C-2. The items in this window fall into five general categories.

Input Source—Defines the origin of pages to be processed: the scanner or Tag Image File Format (TIFF) image files loaded in the TIFF Queue

Process—Defines what type of data is to be output during the job: text, image, or both

Options—Indicates the interactive tools that can be used during the scanning procedure: preview, verify, or feedback

Settings—Provides access to subwindows that are used to define job settings, save and load settings files, and save/restore default settings

General Commands—*Help, Quit, Start, Pause, Resume, Convert, About ScanWorX*

C.3.1.1 Commands

The ScanWorX *Main* window offers all of the commands and options that can be selected to prepare for a scanning. Seven general commands can be selected from the main window by use of the mouse. In general, ScanWorX does not provide a keyboard interface to menu options. Three of the commands are displayed at the top of the main window: *Help, About ScanWorX, and Quit.*

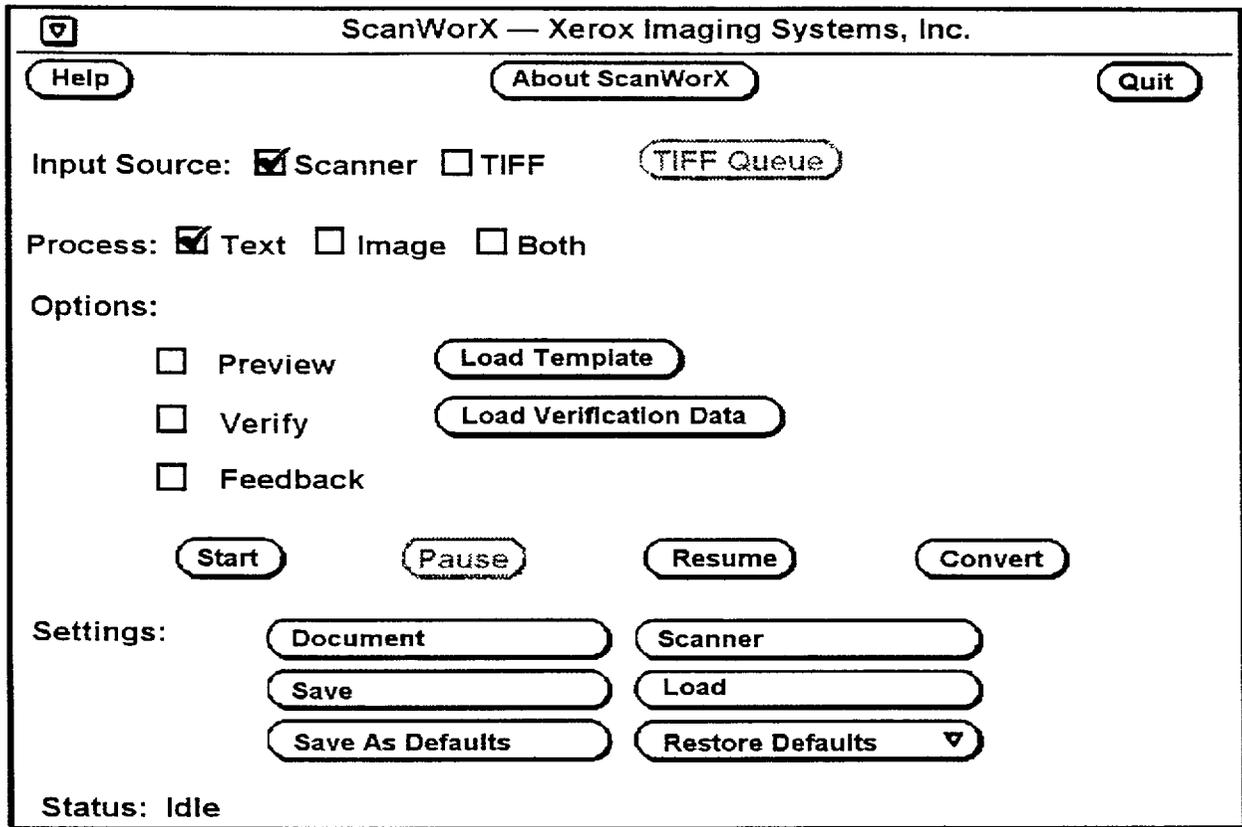


Figure C-2. ScanWorX—main window

Help—Accesses a general message that describes how to use the built-in context-sensitive Help system (Figure C-3). The *Help* window opens onto the desktop. Select the push pin in the upper left corner window to exit from the *Help* window. To use the context-specific help, point to a menu item and press the [Help] key or the [F1] key.

About ScanWorX—Displays a help window with basic ScanWorX product information such as version number and copyright information. Select the *Help* window (or anywhere on the desktop) to close it.

Quit—Closes the ScanWorX main window, all other open subwindows, and terminates the scanning process.

The next four commands are located two-thirds of the way down the *Main* window.

Start—Displays the *Start Processing* window. The *Start Processing* window enables the start of a new job and allows specification of the directory and names of the files to be created. This window is discussed in further detail in Section E.3.4.

Pause—Suspends processing of the current document. A pop-up window (Figure C-4) provides six choices: *Continue*, *Preview Current Page*, *Interrupt*, *End Document*, *Cancel Page*, or *Cancel Document*. *Pause* may be used to change settings and then continue with the job.

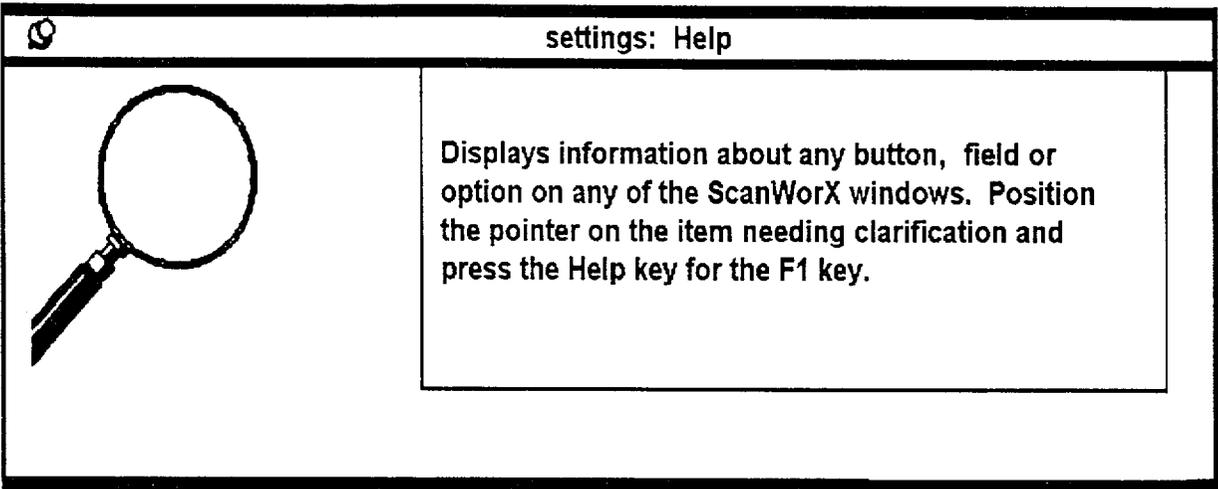


Figure C-3. ScanWorX—general Help window

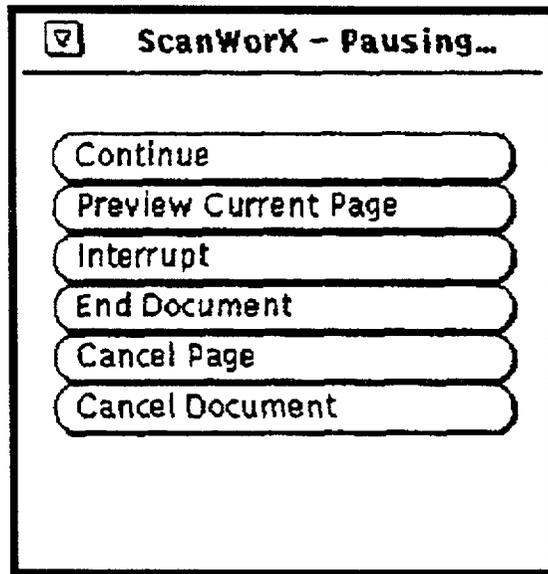


Figure C-4. ScanWorX—pause window

Examples: Select *Pause*, leave the *Pause Window* displayed while changing the settings, then select *Continue* to proceed with the new settings.

Resume—Allows processing of a document that was interrupted to resume. The *Resume* command displays a window where the file name and directory of the interrupted document can be specified.

Convert—Allows conversion of a Format Analyzed Text file to one of the other supported text formats: Interleaf, FrameMaker, WordPerfect, American Standard Code for Information Interchange (ASCII), etc Options

Main window options are listed as headers on the left side of the *Main* window (Figure C-2). The following summarizes the option selections available from the *Main* window.

Input Source

- *Scanner*—Input will be from the scanner.
- *TIFF*—Input will be from *TIFF Queue*. The *TIFF Queue* button becomes available when *TIFF* is selected. Selecting the *TIFF Queue* button displays the *TIFF Queue Manager* window. The *TIFF Queue Manager* allows selection of the files to be processed. The directory displayed may be changed by entering a new pathname and selecting the *Show Files* button. If a group of files is to be processed, ScanWorX automatically treats the group as a document and reads them in the specified order from the *TIFF Queue*. The *TIFF Queue* command allows editing of the “stack” of TIFF files to be recognized.

Process

- *Text*—Only text will be processed from the input source.
- *Image*—Only images will be processed from the input source. A “picture” of each scanned page will be stored in a separate image file.
- *Both*—Both text and images will be processed from the input source. Also known as “compound scanning.” With this option, images will only be processed as line art.

Options

- *Preview*—Opens the *Preview* window for manual zoning.
- *Verify*—Opens the *Verifier* for manual text verification.
- *Feedback*—Opens the *Feedback* window, which displays the scanned page with words being highlighted as they are recognized.

Load Template—Loads a template file (a predefined set of page zones) to use to process the job.

Load Verification Data—Loads a named verification data file to process job.

Settings—Allows viewing and changing of document and scanner settings; saving and loading settings files; saving user defaults, and restoring system or user default settings (Figure C-5).

C.3.2 Document Settings Window

The *Document Settings* window (Figure C-5) is used to inform the system about the document to be processed. These settings include *Page Settings* (*Orientation, Page Size, Column Layout*) and *Recognition Settings*. *Recognition Settings* describe the text to be processed, which optimizes character recognition.

To specify document settings:

1. Select the *Document Settings* command from the *Main* window (Figure C-2). The *Document Settings* window will appear (Figure C-5).
2. Specify document settings for the document to be processed.

Orientation—Select *Portrait* or *Landscape*.

Page Size—Select one of the listed page sizes. When scanning images, select the standard page size that most closely approximates the size of the image to be scanned.

Columns

Specify the *quantity of columns* (1, 2, 3, or 4) for pages that have evenly-spaced columns of equal width..

- *Auto Detect*—Select this option for pages that have an irregular layout, or have more than four columns.
- *Next Page*—Enter the number of the next page to be scanned. In general, if starting a new document, use the default setting of 1.

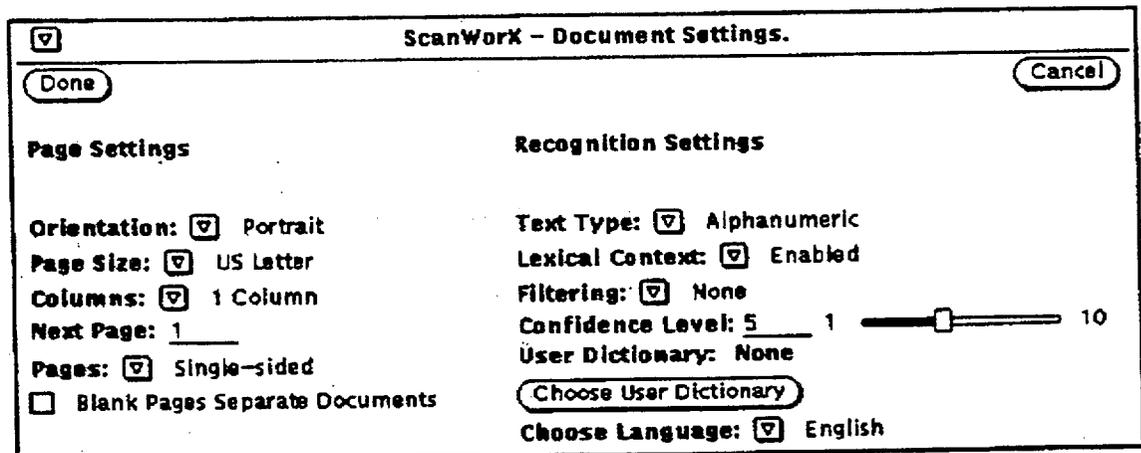


Figure C-5. ScanWorX—Document Settings window

- *Page*—Select *Single-sided* or *Double-sided*
- *Blank pages separate documents*—If set *ON*, multiple documents will be scanned as part of the same job. When *ON*, ScanWorX will interpret a blank page as the start of a new document and open a new output file automatically.

Text type

- *Alphanumeric*—Select this option for scanning input with both numbers and letters.
- *Number Only*—Select this option for scanning financial or other numeric data.
- *Letters Only*—Select this option for scanning input which has few or no numbers.

Lexical context

- *Enabled*—Select this option to specify that the system's language dictionary and context rules are to be used during character recognition. If a user dictionary is loaded, it will also be used.
- *Disabled*—Select this option to prevent the system from using the system (or user) dictionary.
- *No Rules*—Select this option to prevent the system from using either the dictionary(ies) or the context rules.

Filtering

- *None*—Select this option to keep all filters off.
- *Remove Halftones*—Select this option to filter out embedded halftone pictures and speed up character recognition.
- *Enhance Dot Matrix*—Select this option for draft-quality dot matrix documents.

Confidence Level—This entry is an assurance value that the recognition software tries to attain for each character before it releases it as “recognized correctly.” The higher the confidence level, the greater the number of characters that the system will flag as possibly incorrect.

User Dictionary—This is the name of the currently loaded user dictionary, if there is one.

Choose User Dictionary—Key in the full path name of the user dictionary to be loaded.

Load Language—Select the language of the document being recognized. English is the default.

3. Select *Done* to close the *Document Settings* window.

C.3.3 Scanner Settings Window

The *Scanner Settings* window (Figure C-6) is used to inform the system about the document to be scanned. These settings include *Scanner Resolution*, page feeding method, *Output Brightness*, and halftone specifications.

To specify scanner settings:

1. Select *Scanner* in the *Settings* category of the *Main* window (Figure E-2). The *Scanner Settings* window appears (Figure C-6).
2. Specify scanner settings for the document to be processed.

Scanner Resolution—Three resolutions are available: 400 dpi (default), 300 dpi, and 200 dpi. In general, the highest available resolution achieves the most detailed image. To obtain the most accurate image file, try to match the resolution of the scanned image with the device that will be used to print it. For example, for a 300 dpi laser printer, the images should be scanned at 300 dpi. If the image to be scanned is relatively simple, for example a line drawing, a lower resolution can be selected. This reduces the amount of time it takes to scan and recognize the images, and the size of the resulting file. If the image is a continuous tone (contone) image, the higher the resolution, the greater the number of gray levels that can be represented by the halftone pattern, thus the more accurate the resulting image file. Use the default (400 dpi) for all text documents.

Use Automatic Document Feeder (ADF)

ON—Select *ON* if pages will be loaded in the ADF.

OFF—Select *OFF* if pages will be manually placed on the flatbed. Scanning images on the flatbed eliminates the possibility of skew induced by the ADF mechanism.

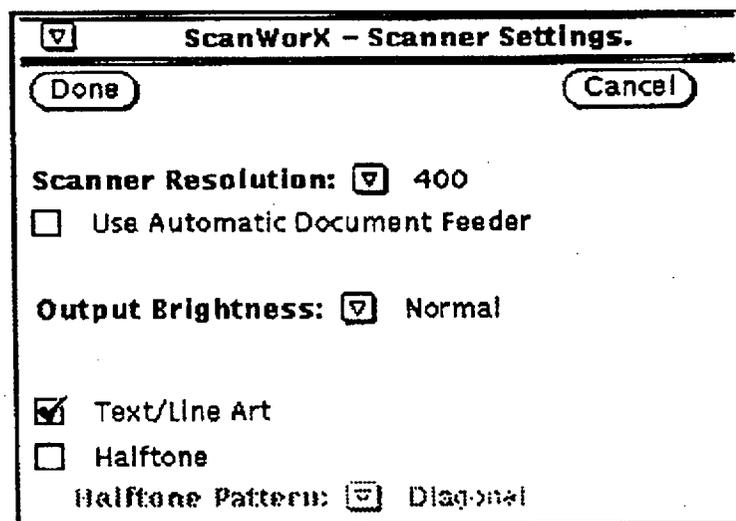


Figure C-6. ScanWorX—Scanner Settings window

Output Brightness

- *Normal*—Use this setting unless the document is very dark or very light. *Normal* is the default setting: it is usually adequate for most good-quality images.
- *Light/Lighter*—Select this setting if the characters appear too bold, are starting to fill in, are touching, or if words are separated by very small spaces (as in some magazines). Also, recognition of document with a lot of background noise, or with colored backgrounds, may improve considerably by using a lighter setting.
- *Dark/Darker*—Select this setting if the characters appear faint, broken, or very thin.
- *Custom*—Select this setting to access the slider bar so brightness can be adjusted in finer increments.
- *Text/Line Art*—Select this setting for text scanning, or if scanning a black and white line drawing, or to achieve a posterized look from a continuous-tone image.
- *Halftone*—Select this setting for image scanning to simulate the continuous tone of a photograph or color illustration with different bit-mapped patterns and densities of black dots. Leave *OFF* for text scanning.
- *Halftone Pattern*—This option becomes available when *Halftone* is selected. If scanning a halftone image, one of ten halftone patterns can be specified.

3. Select *Done* to accept the new scanner settings. The *Start Processing* window (Figure C-7).

C.3.4 Start Processing Window

The *Start Processing* window (Figure C-7) enables starting a new job, specification of the directory and names of the files to be created, and specification of the text and image file formats.

C.3.4.1 Output File Names

When specifying the document name, do not include a file extension. For all output files, ScanWorX appends an identifying extension (Table C-1).

When scanning images, the name specified will be the *base* name. This *base* name is used for all of the image files created during a scanning session (multiple images may be scanned during one session). To differentiate between image files created during one scanning session, the system appends a three digit page number to the *base* file name. For example, if “tampa” is entered as the *base* name, the first file name will be:

tampa_pg001.ext

The file extension is dependent upon the image or text format selected from the *Text Format* or *Image Format* pop-up screens (see Figure C-8, Section C.3.4.3 and Table C-1).

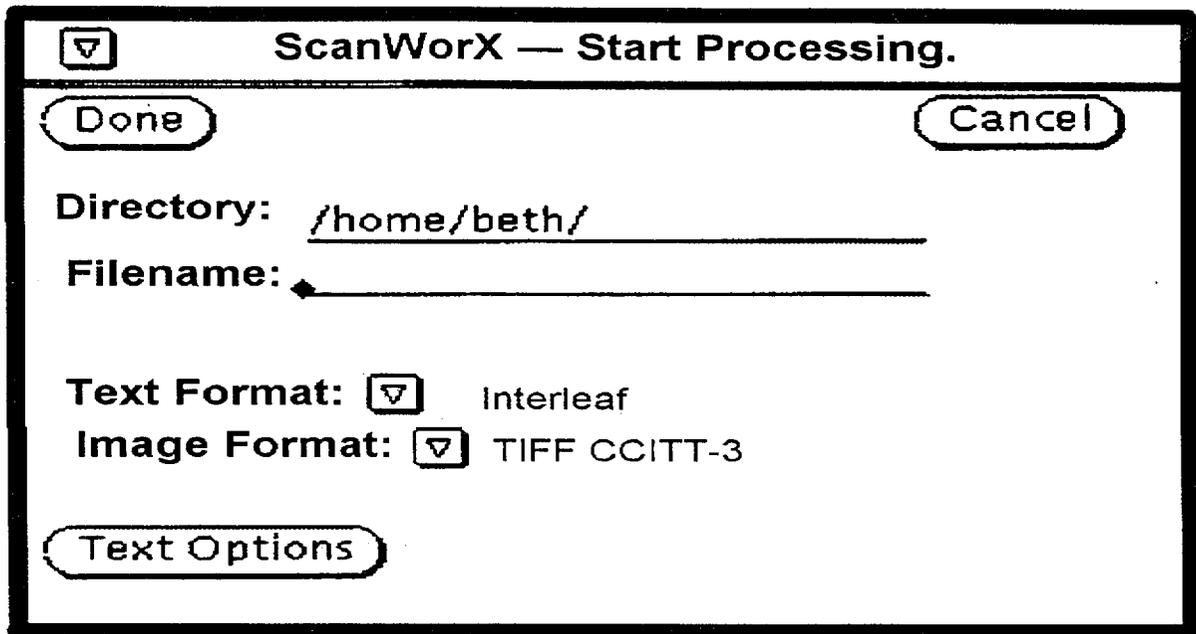


Figure C-7. ScanWorX—Start Processing window

Table C-1. File types and file extensions

File Type	File Extension	Description
Interleaf	.doc	Text files in Interleaf ASCII format.
FrameMaker	.mif	Text files in FrameMaker's Interchange Format.
WordPerfect 4.2	.txt	Text files in WordPerfect 4.2 ASCII format.
WordPerfect 5.X	.txt	Text files in WordPerfect 5.0 format.
ASCII	.txt	Text files in straight ASCII format.
Raster Image	.ras	Image files in Sun Raster or Raster Encoded format.
TIFF Image	.tif	Tag Image File Format (TIFF) images.
KDOC	.kdc	An unconverted file containing recognized text and formatting for later conversion to Computer Acquisition and Logistics Support (CALs) or other third party format.
Interleaf Image	.img	Image files in Interleaf Graphics Format.
Format analyzed text	.@fa	Unconverted document file containing formatting information. This file, created when Format Analyzed Text was selected, must have a companion .@fc file.

Table C-1. File types and file extensions (cont'd)

File Type	File Extension	Description
Document content	.@dc	Unconverted file containing document content. This file must have a companion .@fa file.
Verification data file	.@cs	Contains a reloadable verification data set created with the ScanWorX Verifier option.
Template file	.@tm	Contains a reloadable set of zones defined with the Preview option.
Settings file	.@in	Contains a reloadable group of settings to streamline job processing.
User dictionary	.@lx	User-defined word list to improve text recognition.
Temporary	.@ti	Temporary settings file created when files are interrupted.
	.@tc	Temporary verification data file.
	.@tf	Temporary unconverted document file.
	.@tq	Temporary TIFF Queue file.
	.@tt	Temporary template file.

C.3.4.2 Text Format Pop-Up Window

ScanWorX supports output of recognized text to seven final formats, and two proprietary formats for later conversion.

To specify the output text file format:

1. Select the *Text Format* button of the *Start Processing* window. The *Text Format* pop-up window appears (Figure C-8). The default selection is outlined with a double border.
2. Change the text format selection by holding down the right mouse button, pointing to the new format, then releasing the button. The text format selections are described below:

Text with Linebreaks—Select this format if the scanned document consist primarily of text in a simple format. The *Text with Linebreaks* settings output end-of-line and end-of-paragraph codes to maintain line and paragraph breaks. All tabs used in the original document are replaced by spaces. Therefore, if the document contains tabular information that needs to be maintained, choose *Tab Delimited*.

Text Only—Select this format if the scanned document contains only text with little or no formatting. The *Text Only* settings outputs end-of-paragraph marks only. It does not output end-of-line codes and wraps text continually until it reaches an end-of-paragraph mark. Line

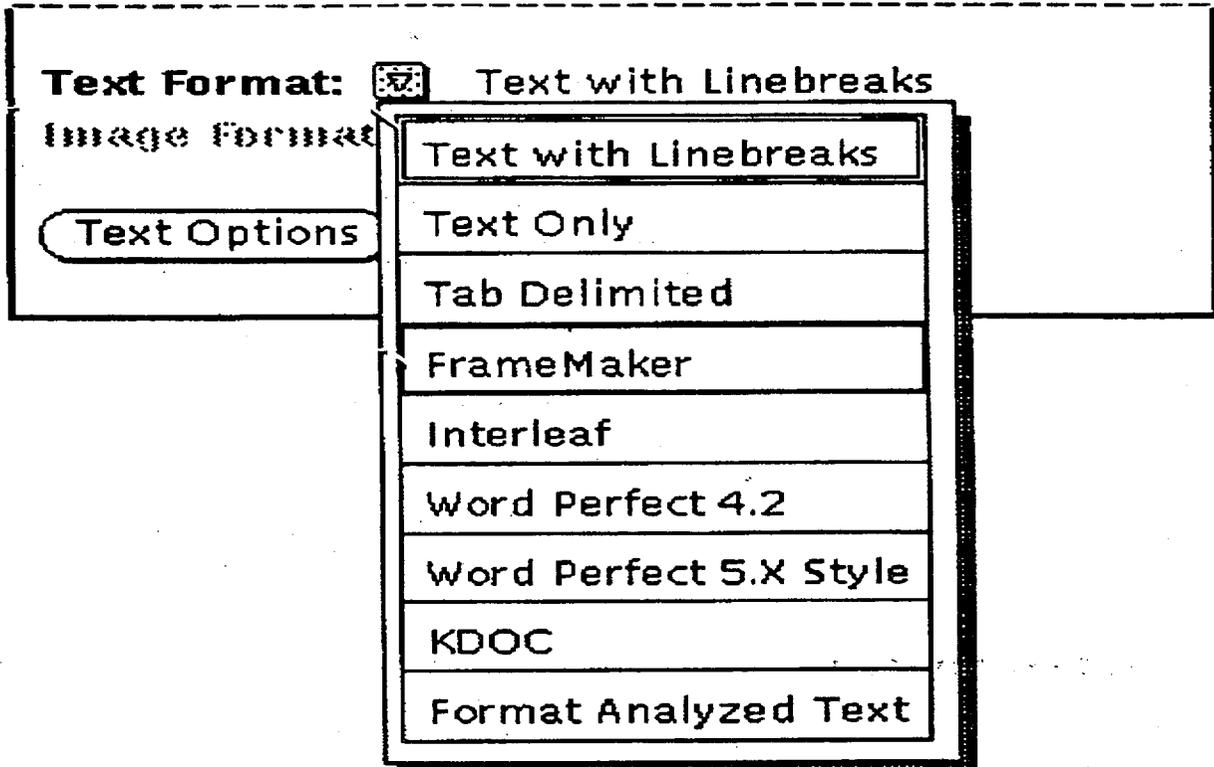


Figure C-8. ScanWorX—Text Format pop-up window

length (number of characters per line) is determined by the application used to import and edit the scanned text.

Tab Delimited—Select this format if the scanned document contains tabular information that needs to be maintained, such as spreadsheets or tables. the *Tab Delimited* setting recognizes and outputs: tabs, end-of-line codes, and end-of-paragraph codes.

FrameMaker—Select this format if the text output from the scanned document is to be output to the Maker Interchange Format (MIF), Frame Technology's ASCII format with embedded markup codes.

Interleaf—Select this format if the text from the scanned document is to be output to Interleaf ASCII Format, Interleaf's ASCII format with embedded markup codes. Interleaf's ASCII Format files can be imported to Interleaf TPS 4.0 and later on the Sun system.

WordPerfect—ScanWorX converts scanned text to two WordPerfect text formats:

- *WordPerfect 4.2*—This option supports simple text formatting including tabs, indents, underlines, and centers.
- *WordPerfect 5.X Style*—This option supports the same text formatting as 4.2 plus more complex features such as styles.

KDOC—Select this format if the text from the scanned document is to be output to a file for eventual conversion to CALS. *KDOC* is the ScanWorX-proprietary interim format for eventual conversion to CALS and other third-party formats.

Format Analyzed Text—This is an interim (unconverted) format for eventual conversion to one of the final formats: *Text with Line Breaks*, *Text Only*, *Tab Delimited*, *FrameMaker*, and *KDOC*. The benefit of saving text as *Format Analyzed Text* is that the *Convert* command can be used to convert it to more than one format. For example, it can convert the file to *Text with Line Breaks* to use in an on-line database. Then, it can be converted to *FrameMaker* for desktop publishing. The *Format Analyzed Text* file remains intact until it is manually removed.

C.3.4.3 Image Format Pop-Up Window

ScanWorX supports six output formats for scanned images.

To specify the image file output format:

1. Select the *Image Format* button of the *Start Processing* window with the right mouse button. The *Text Format* pop-up window appears. The default selection is outlined with a double border.
2. Change the image format selection by holding down the right mouse button to display the pop-up menu, pointing to the new image format, then releasing the button. The image formats supported are:
 - Interleaf (IGF)
 - TIFF Uncompressed
 - TIFF CCITT-3
 - TIFF CCITT-4
 - Sun Rasterfile Standard
 - Sun Rasterfile Encoded

C.3.4.4 Text Options Pop-Up Window

To define the text options, select the *Text Options* button on the *Start Processing* window to display a *Text Options* selection window (Figure C-9).

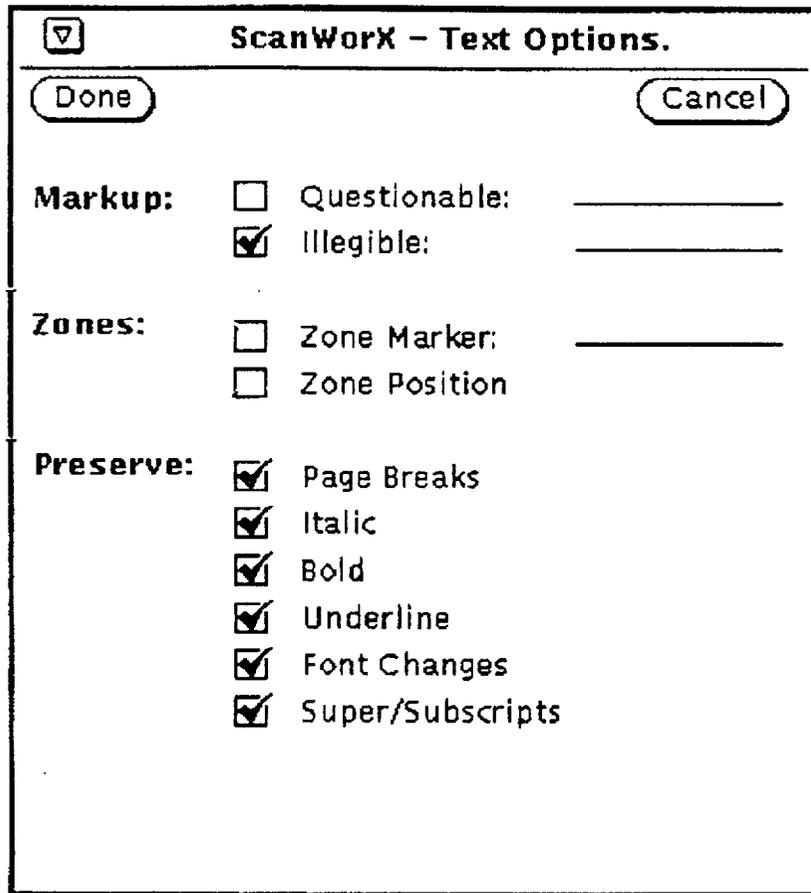


Figure C-9. ScanWorX—Text Options pop-up window

The *Text Options* selections are defined as:

Markup

- *Questionable*—This selection allows specification of characters used to flag any character ScanWorX is unsure about. The flag appears directly before the questionable character in the output file.
- *Illegible*—This selection allows specification of characters to flag characters ScanWorX could not recognize. A flag appears in place of the illegible character.

Zones

- *Zone marker*—This selection allows specification of characteristic flags that ScanWorX will write in the output file at points where new columns or zones in the original hard copy begin. For example:

<z>

- *Zone position*—This selection allows output of zone coordinate information in the output file. Each zone position code has six values, separated by commas and enclosed in square brackets. For example:

[185,0,153,623,t,0]

The syntax of the zone position code is as follows: **[lm,tm,w,h,t,0]**

lm—distance from the leftmost edge of the original page to the left edge of the zone, in points

tm—distance from the topmost edge of the original page to the top edge of the zone, in points

w—width of the zone in points

h—height (vertical length) of the zone, in points

t—a fixed value set by the system

0—a fixed value set by the system

- *Preserve*—Allows preservation of italic, bold, underlines, font changes, page breaks, and subscripts and superscripts. (Preserve options other than page breaks are available only for Interleaf, FrameMaker, and WordPerfect 5.X Style formats.)

C.4 MULTIPLE-PAGE AND DOUBLE-SIDED DOCUMENTS

C.4.1 Multiple-Page Documents

The ScanWorX scanner is a 400 dpi flatbed scanner with an ADF. The ADF has a capacity of 50 pages. Individual pages may be placed face-down on the flatbed for individual scanning (optimum method for image scanning), or the ADF may be used for volume processing of multiple page documents.

C.4.1.1 Loading Portrait Oriented Pages

Place the stack of pages (do not exceed 50 pages) in the ADF oriented in the following manner:

- Face down
- Page top entering the scanner first

C.4.1.2 Loading Landscape Oriented Pages

Place the stack of pages in the ADF, oriented in the following manner:

- Face down
- Page top along the left edge of the ADF

C.4.1.3 Using Document Separators

Multiple documents of similar format that require identical settings may be scanned as a single job and output to different files by using document separators. When document separators are used, each time ScanWorX encounters a blank page, it will end the current output document and begin another one.

To scan multiple documents as a single job:

1. Setup for the job (*Document Settings, Image Settings, Text Formatting, etc.*).
2. Load the pages to be scanned into the ADF, inserting a blank piece of paper between each separate document.

C.4.2 Double-Sided Documents

ScanWorX provides automatic collation of double-sided documents. Thus, all of the odd pages can be scanned first, then the stack can be flipped and the reverse sides scanned. When scanning a double-sided document, perform job setup as necessary for the document to be scanned (*Text Scanning, Image Scanning, Compound Scanning*). Then continue with the following steps to process the double-sided document.

1. Load the document in the scanner. If using the ADF, place the documents in the ADF face down, with the top of the pages entering the scanner.
2. Specify *Document Settings*. Be sure to select double-sided in the *Pages* field. To start scanning on an even-numbered page, specify the correct number in the *Next Page* field so ScanWorX can correctly collate the pages.
3. Select *Done* in the *Start Processing* window. The scanner scans the odd sides of all the pages in the ADF. When all pages have been scanned, the system displays the *Out of Input* window (Figure C-10).
 - To process more right-hand (front side) pages go to Step 4.
 - To process more reverse sides of the double-sided pages, go to Step 6 To end the document before ScanWorX scans the even pages, recognizes text, converts, automatically collates, and outputs the document to a file formatted for a text application, go to Step 7.
4. Load more pages in the scanner, then select *Continue*. The system scans and recognizes the pages, then again displays the *Out of Input* window.
5. Turn the stack over and place it in the ADF so the last even-numbered page is in position to be scanned next.
6. Select the *Flip and Continue* button (Figure C-10). The *Next Page* number in the *Document Settings* window is updated appropriately and scanning resumes. When all of the pages have been scanned, the *Out of Input* window is redisplayed.

Note: If multiple stacks of pages have been scanned, be sure to process the reverse sides in descending order.

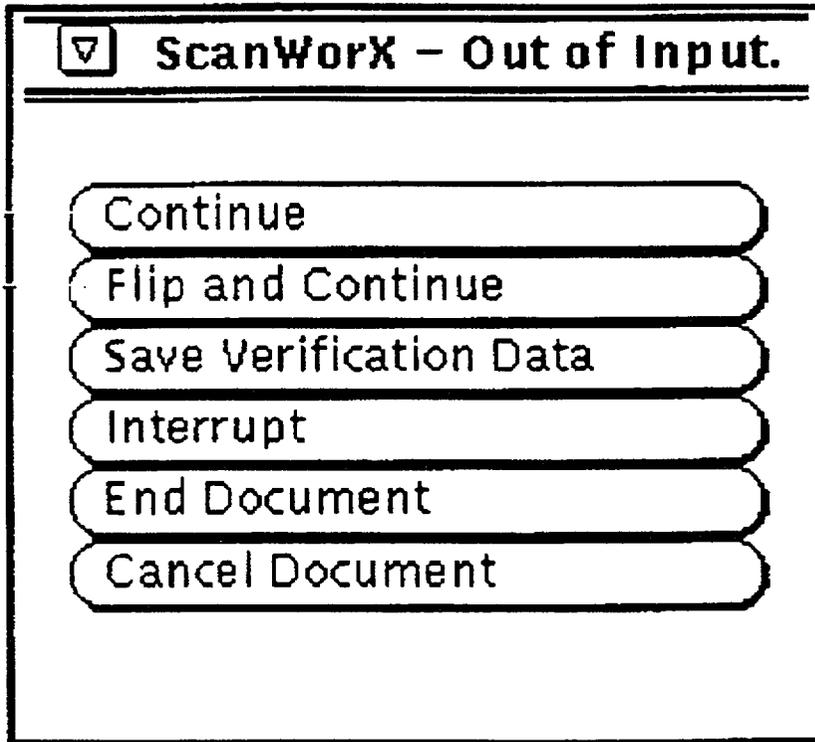


Figure C-10. ScanWorX—Out of Input window

7. When all pages of the document have been processed, select the *End Document* button.

The system outputs the recognized text in the selected format. During the conversion process, the system performs automatic collation, sequencing the scanned text in the same order it appeared in the original double-sided document.

C.5 SCANNING TEXT

To scan a text document into a text-editable file: specify document settings, specify scanner settings, start the job, specify text options, and process the document. The following steps provide a guide through this process. If many similar scan jobs are to be performed, the setup process can be streamlined by creating a *settings file* that may be loaded to process future jobs.

1. Select *Scanner* as the *Input Source* on the *Main* window (Figure C-2).
2. Select *Text* as the *Process Type* on the *Main* window.
3. Select the *Start* command on the *Main* window. The *Start Processing* window appears (Figure C-7).
4. Specify the output directory and document name. (Do not include a file extension.) (Reference Section C.3.4.1)

5. Specify the Text Format (Figure C-8). Select the pop-up menu with the right mouse button. The default is outlined with a double border. To change the selected format, hold down the right mouse button, point to the new format, then release the button.
6. Load the document in the scanner. If using the ADF, place the documents in the ADF face down, with the top of the pages entering the scanner.
7. Select *Done* in the *Start Processing* window.

The scanner scans all the pages. When all pages have been scanned, the system displays the *Out of Input* window (Figure C-10).

8. If there are more pages to scan, load the additional pages, then select *Continue*. If there are no more pages, select the *End Document* button.

The system outputs the recognized text to the selected formatted file type for use with word processing, desktop publishing, or other text applications.

C.6 SCANNING IMAGES

For image scanning, only some of the settings in the *Document Settings* window are appropriate. These are *Orientation* and *Page Size*.

1. Select the *Document* command in the *Main* window. The *Document Settings* window appears (Figure C-5).
2. Specify document settings appropriate for the image to be scanned (see Section C.3.2).
3. Select *Done*. The *Document Settings* window closes.
4. From the *Process* category in the *Main* window, select *Image*. The *Image* button is turned on.
5. Select *Scanner Settings* from the *Main* window. The *Scanner Settings* window appears (Figure C-6).
6. Specify scanner settings (reference Section C.3.3.).
7. Select *Done*. The *Scanner Settings* window closes.
8. Select the *Start* command from the *Main* window. The *Start Processing* window is displayed (Figure C-7).
9. Specify the output directory and file name. Do not include a file extension.
10. Select *Done*. ScanWorX displays the *Start Processing* window and scans the image on the flatbed. The system then displays the *Out of Input* window.
11. Continue or end the job. To continue, go to Step 12; to end the job, go to Step 13.

12. Place another image on the scanner flatbed, then select *Continue*. The image is processed to the same base name.
13. To end the image scanning document, from the *Out of Input* window select *End Document*. The images that were scanned are written to the system.

C.7 COMPOUND SCANNING (TEXT AND IMAGES)

Text scanning creates a binary image of the page and then performs character recognition on the image. Any graphics on the page are ignored. During image scanning, all print on the page is read as black and white pixels and the data is stored in the specified image file format. Compound scanning allows text and images to be processed at the same time. Separate files result from compound scanning; a text file for the recognized text and an individual image file for each page of the document. Note: With compound scanning, the page images will be saved only as binary (Text/Line Art) data.

With compound scanning, all of the text and graphics in a document can be processed in a single procedure. Later, an image editor can be used to edit the desired specific graphics.

To scan text and images in a single process:

1. Set up the text scanning options. Refer to Section C.3.2 for settings.
2. Load the document into the scanner.
3. Select the following options on the *Main* window (Figure C-2):
 - a. *Input Source* = Scanner
 - b. *Process* = Both
4. Select the *Start* command from the *Main* window. The *Start Processing* window appears (Figure C-7).
5. Specify the output path and file name.
6. Specify the *Text Format* (refer to Figure C-8) and the *Image Format* (refer to Section C.3.4.2).
7. Define the *Text Options* (refer to Section C.3.4.4).
8. In the *Start Processing* window, select *Done*.

The scanner now scans all of the loaded pages. When all of the pages have been scanned, the *Out of Input* window is displayed (Figure C-10).

9. When all pages have been scanned, select the *End Document* button in the *Out of Input* window.

The system outputs the recognized text to the specified format for use with a text application.

The page images are stored in image files in the format specified in Step 6.

C.8 PREVIEWING DOCUMENTS

ScanWorX provides previewing tools that allow control of how each page of a document is processed. A page can be viewed and zones created to identify data as text, image, or to be ignored.

To open the *Document Preview* window, select the *Preview* box in the *Main* window (Figure C-2). The *Document Preview* window is organized in three sections: commands, a toolbox, and a preview window.

C.8.1 Preview Commands and Options

At the top of the *Document Preview* window (Figure C-11), directly below the title bar, are eleven commands and options. They are as follows:

Process—Recognizes the current page, and then scans the next page of the document or reads in the next TIFF file and displays it in the *Preview* window.

Scan Page— Scans a page or reads in another TIFF file at any time.

Interrupt—Saves all the intermediate character recognition and format analysis files for pages of the document that have been recognized so far. Processing of this document can be resumed later.

Cancel Page—Cancels the page being processed. All previous pages are retained.

End Document—Converts all pages of the document that have been recognized so far. This option brings the system back to the idle mode and recognition processing and scanning are no longer in process.

Cancel Document—Cancels processing of this document, removes all temporary files, and clears the document preview window.

Load Template—Loads a set of zones previously saved in template files.

Save Template—Saves the set of zones currently displayed in the preview window to a named template file that can be reloaded for future jobs.

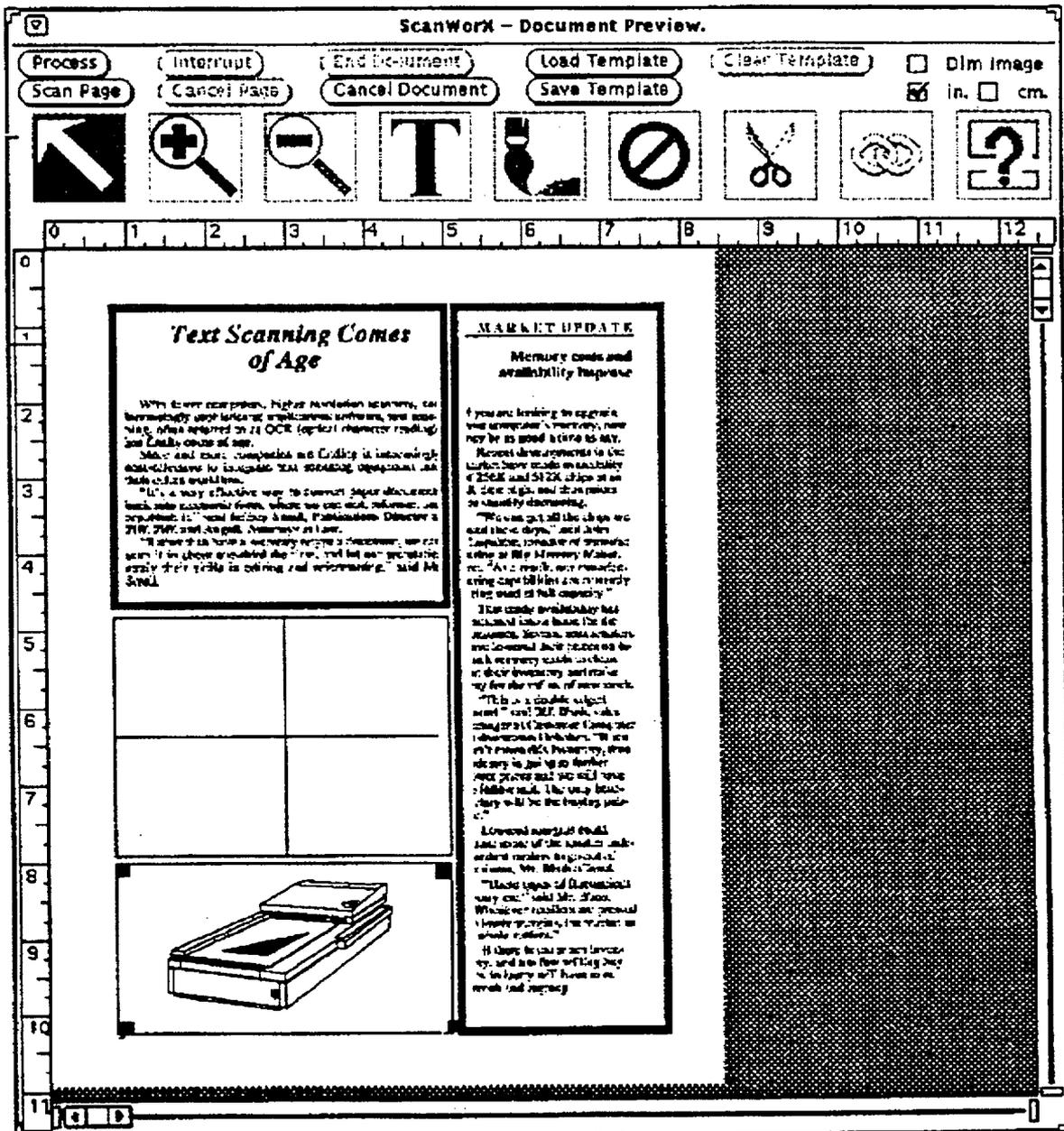


Figure C-11. ScanWorX—Document Preview window

C.8.2 Preview Toolbox

The toolbox is the series of icons near the top of the *Preview* window directly beneath the commands (Figure C-11). There are nine icons that enable a variety of operations in the *Preview* window. When the icon is selected and the cursor moved within the *Preview* window, the cursor takes the shape of the icon. The intended operations can then be performed.

The functions of the nine tools are as follows:

-  **Edit Zone**—Use to select, move, and resize rectangles
-  **Zoom In**—Use to zoom in on the previewed page
-  **Zoom Out**—Use to zoom out on the previewed page
-  **Text Zone**—Use to outline text areas for text recognition
-  **Image Zone**—Use to outline areas to be processed as image files
-  **Ignore Zone**—Use to outline areas to be ignored during processing
-  **Delete Zone**—Use to delete text zones, image zones, ignore zones, and cut links
-  **Link Zones**—Use to link the order in which zones of the same type are to be processed
-  **Zone Attributes**—Use to specify recognition settings for individual text zones

C.8.3 Previewing a Page

The following procedure provides basic instructions for previewing and zoning a page for scanning and character recognition.

1. From the *Options* category in the *Main* window, select the *Preview* check box.
2. Select the *Input Source*.³ Prepare the scanner or *TIFF Queue*. If the input is the scanner refer to Section C.3.
4. Select the *Process* type that applies to this job (text only, images only, or both).
5. Select the *Start* push-button. The *Document Preview* window opens (Figure C-11).
6. Select the *Scan* page command at the top of the *Document Preview* window. The *Start Processing* window is displayed (Figure C-7).

7. Specify the appropriate entries in the *Start Processing* window, then select *Done*. Refer to Section C.3.4.

The image is scanned (or read from a TIFF file) and is displayed in the *Preview* window.

C.8.4 Zoning Pages

Identifying precise areas of a page to be processed is referred to as zoning. Areas of the page can be zoned as text zones, image zones, and ignore zones by use of the *Preview* window tools. Using text zones can speed up the recognition process by excluding areas of the page not to be processed. A total of 39 zones can be setup on a single page.

C.8.4.1 Creating a Text Zone

To create a text zone:

T

1. With a page displayed in the *Preview* window, select the *Text Zone* icon (left) in the toolbox. The mouse pointer becomes the “T” symbol icon.
2. Draw the text zone rectangle. Select and hold on the upper left corner of the area to be defined as a text zone. Drag the mouse toward the lower right corner of the zone. A zone rectangle is drawn around the text area (Figure C-12). Release the mouse button when the rectangle outlines the entire text zone.
3. Use the *Edit Zone* tool (left) to select and edit zones.
4. Use the *Zoom In* tool (left) to magnify the page display so the edges of the rectangles can be precisely defined.
5. Use the *Zoom Out* tool or the scroll bars to display the next area to zone. A text zone can be created that overlaps another zone. The last text zone created takes precedence over the zone that it overlaps. Any text contained in both zones belongs to the topmost zone.



Repeat this procedure until all of the text zones for the page have been defined.

C.8.4.2 Specifying Text Zone-Specific Recognition Settings

Without specific instructions, ScanWorX recognizes all text zones on a previewed page with default recognition settings. These include text type (alphanumeric, numbers only, or letters only); and whether to use context verification during recognition.

To control how individual text zones on a page are to be processed, zone-specific recognition settings must be specified. When all text on a page is generally the same type, *Document Settings* in the *Main* window for all zones can be specified; zone specific recognition settings are not necessary.



Figure C-12. ScanWorX—Text Zone

However, if the text to be processed differs in format, such as a financial table that includes both text and numbers, zone-specific settings should be used. For a zone containing a financial table, zone-specific settings might include *Numbers Only* and *Context Verification OFF*. This should result in recognitions being faster and more accurate than using normal text default settings.

To specify zone-specific settings:

1. Use the *Text Zone* tool to identify the text zones. All of the text zones on a page may be setup before defining the recognition settings for individual zones.
2. Select the *Zone Attributes* tool (left).
3. Define the zone information for a specific text zone. Place the mouse pointer (now displayed as the *Zone Attributes* icon) inside a text zone on the page, then press the mouse button. The *Recognition Settings* window is displayed (Figure C-13).
4. Specify *Recognition Settings* as required by the type of text.

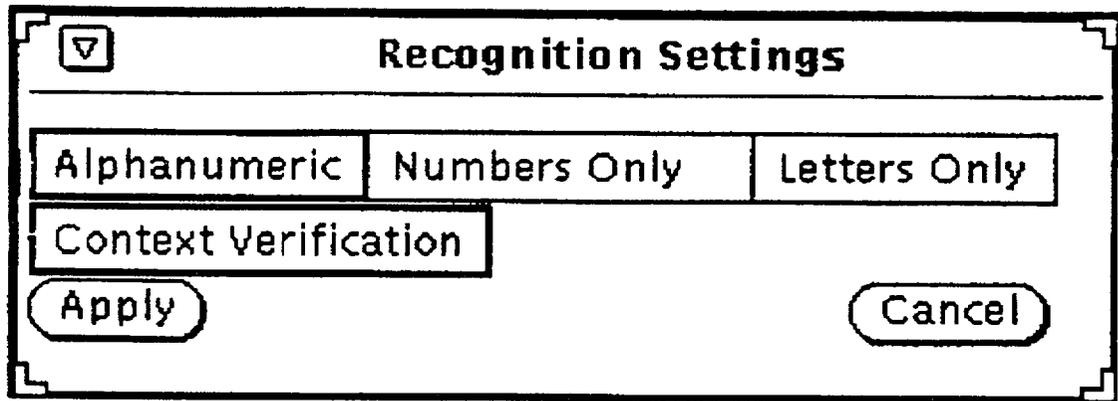


Figure C-13. ScanWorX—Recognition Settings for individual text zones window

5. Select *Apply*.
6. Repeat Steps 2 through 5 for each zone requiring specific recognition settings.

C.8.4.3 Creating an Image Zone

The process of creating image zones is very similar to the process for creating text zones. When a page with image zones is processed, each image zone is output to a separate file that can be used with compatible applications.

When setting up to process a document with images, either *Image* or *Both* must be selected as the *Process* on the *Main* window (Figure C-2). Otherwise, image zones are not processed.

To create image zones:

1. With the page displayed in the *Preview* window, select the *Image Zone* tool (left).
 2. Draw the image zone rectangle.
 - a. Select and hold the upper left corner of the area to be defined as an image zone.
 - b. Drag the mouse toward the lower right corner of the zone. A zone rectangle is drawn around the image area.
 - c. Release the mouse button when the rectangle outlines the image zone. Handles appear in the corners of the image zone, indicating that the zone is currently selected.
 3. Use the *Edit Zone* tool (left) to select and edit zones.
 4. Use the *Zoom In* tool (left) to magnify the page display so the edges of the rectangles can be precisely defined.
 5. Use the *Zoom Out* tool or the scroll bars to display the next area to zone.

Repeat this procedure until all of the image zones for the page have been defined. A total of 39 zones (of all types) can be created on a single page. A zone may be created that overlaps another zone. The last image zone created takes precedence over the zone that it overlaps. Any part of an image contained in both zones belongs to the topmost zone.

Image files zoned from a page use the document name as the base name. A three-digit page number and a two digit figure number are appended. For Example: `tampa_pg001_fg01.ext`

In the above example, “tampa” is the base name, “001” is the page number, “01” is the figure number on that page, and “.ext” is the extension that identifies the output format (reference Section C.3.4.1, *Output file names*).

C.8.4.4 Creating Ignore Zones

It may be desirable to specify areas of the previewed page to be ignored when the job is processed. For example, there may be a logo or a portion of an article that you do not wish to process, ignore zones are used for this purpose.

To create ignore zones:

-  1. With the page displayed in the *Preview* window, select the *Ignore Zone* tool (left).
2. Draw the ignore zone rectangle.
 - a. Select and hold the upper left corner of the area to be defined as an image zone.
 - b. Drag the mouse toward the lower right corner of the zone. A zone rectangle is drawn around the image area. An ignore zone rectangle is divided into four quarters by two thin, solid lines (Figure C-14).
 - c. Release the mouse button when the rectangle outlines the ignore zone. Handles appear in the corners of the image zone, indicating that the zone is currently selected.
-  3. Use the *Edit Zone* tool (left) to select and edit zones.
-  4. Use the *Zoom In* tool (left) to magnify the page display so the edges of the rectangles can be precisely defined.
5. Use the *Zoom Out* tool or the scroll bars to display the next area to zone.

Repeat this procedure until all of the ignore zones for the page have been defined. A total of 39 zones (of all types) can be created on a single page.

C.8.4.5 Linking Text or Image Zones

Normally, ScanWorX processes zones on a page from left to right, top to bottom. However, the sequences in which the zones are processed can be specified by use of the *Link Zones* tool. *Text zones* can only be linked to text zones, and image zones can only be linked to image zones.

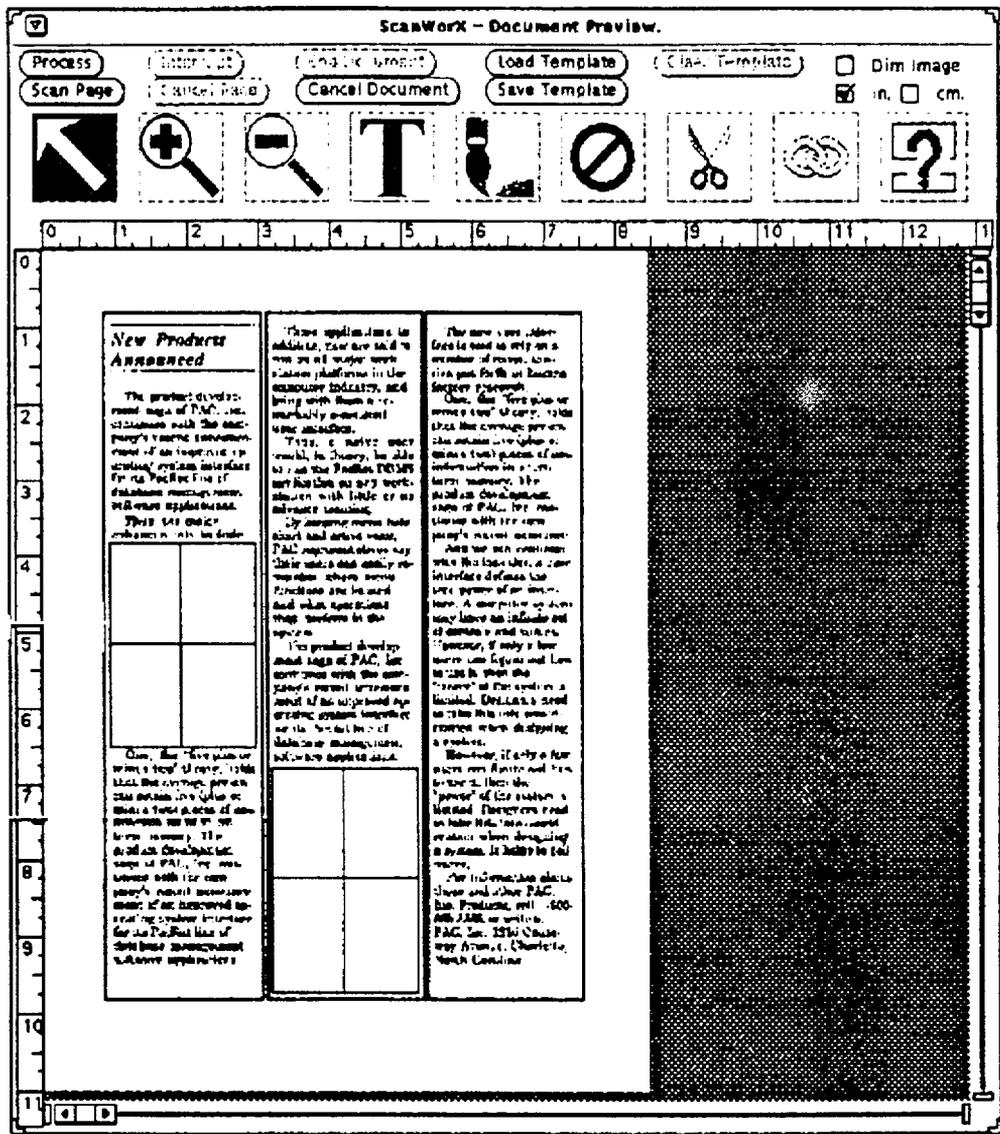


Figure C-14. ScanWorX—ignore zones

With text zones, the *Link Zone* tool can link multiple text zones to determine the order in which the recognized text is output to a text file. With images (each of which are output to separate files), the *Link Zone* tool controls the order in which they are processed and, by extension, the figure numbers that are appended to image file name.

To link zones:

1. With the page displayed in the *Preview* window, select the *Link Zones* tool (left).
2. Position the cursor in the zone to be processed first.

3. Hold down the left mouse button and drag the cursor into the second zone. The cursor draws an arrow from the first to the second zone. This arrow indicates the order in which the zones are to be processed (Figure C-15).
4. Position the cursor in the second zone, hold down the left mouse button, and drag the cursor into the third zone.
5. Repeat Step 4 until all of the zones to be linked are connected. If any zones are left unlinked, they are processed after all linked zones.

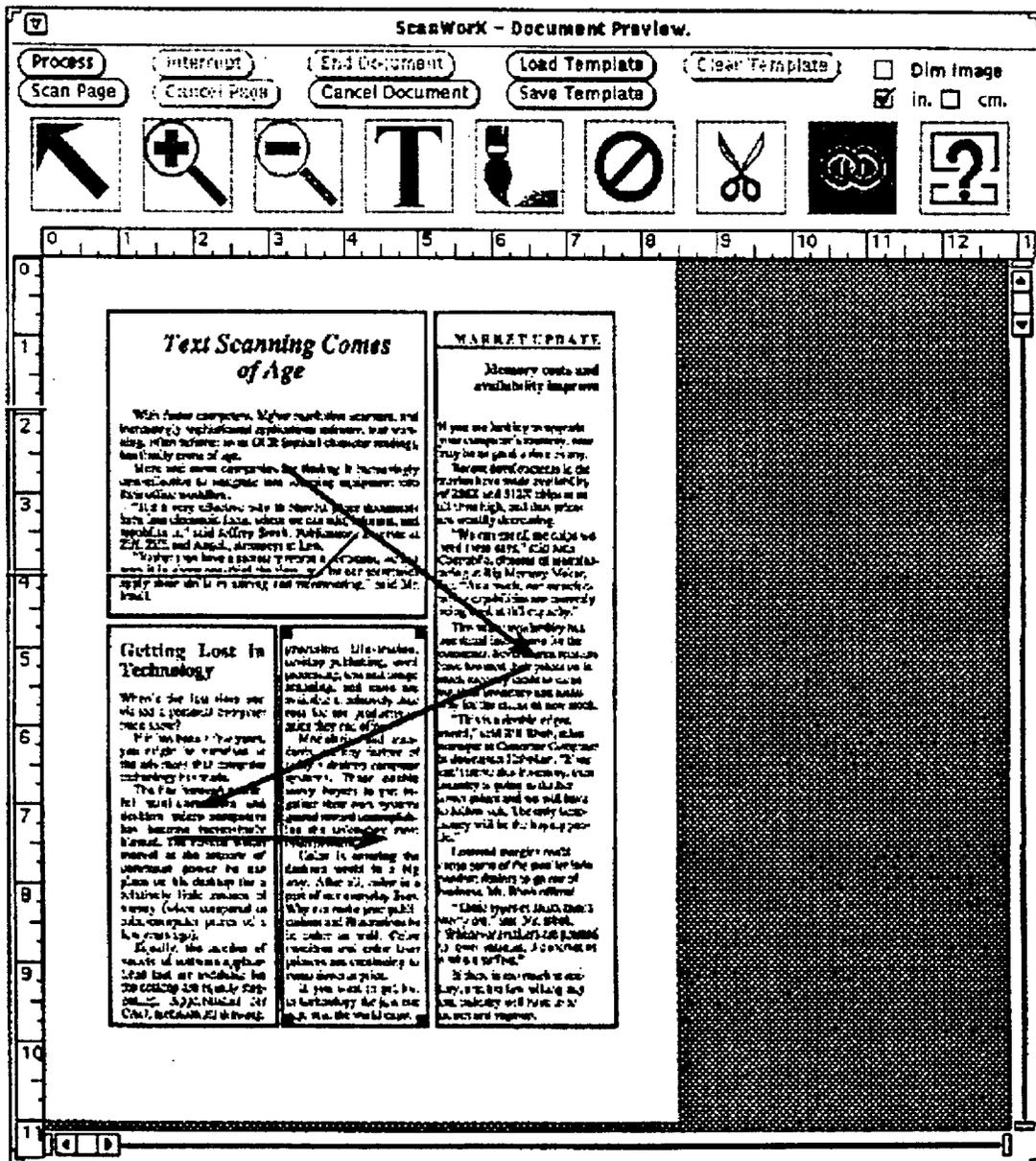


Figure C-15. ScanWorX—linked zones

C.8.5 Processing a Previewed Document

After the first page of a document has been displayed in the *Preview* window, it can be processed. There are two options for processing the document: (i) display and zone each page individually, or (ii) set up a page template (set of zones) on the first page and process all pages with the same template.

With the first page of the document displayed in the *Preview* window, use the following procedure to process the document.

1. Create zones and perform other previewing operations, as required, for the displayed page. Refer to the previous sections in C.8 for details.
 - To process each page individually, go to Step 2.
 - To process all pages with the same template, go to Step 3.
2. Leave the preview window open, and select the *Process* command at the top of the window. Text and/or images are processed, then the next page in the scanner (or in the *TIFF Queue*) is displayed in the *Preview* window.

Proceed from Step 1 to process each additional page.

When all pages have been processed, the *Out of Input* window is displayed (Figure C-10). Proceed to Step 4 to end the document.

3. Select the *Preview* check box in the *Main* window (Figure C-2). The *Preview* window closes, and all pages in the scanner (or the *TIFF Queue*) are processed according to the same template.

When all pages are finished, the *Out of Input* window is displayed.

4. When the job is completed, select *End Document* in the *Out of Input* window. A single text file is created and saved in the specified directory and path name. Image files are saved in the specified format.

C.9 VERIFYING TEXT

Certain document characteristics can cause character recognition accuracy to decline. Examples are: ornate, thin-stroke typefaces, dirt, smudges, handwritten notes, and documents with *noise*—such as second or third generation photocopies.

To ensure the optimum character recognition, ScanWorX provides interactive text verification tools collectively call the Verifier. The Verifier is a subsystem that enables the user to view and interact with the system's Intelligent Character Recognition to verify recognized text, and to correct errors. The Verifier also allows the user to provide values for special characters or symbols that have no ASCII identification. By verifying the first one or two pages of a long document, the accuracy rate for the entire document can be improved.

The results of a verification session, called verification data, can be saved in reusable files. Whenever it is necessary to process the same type of document, the verification data file can be reloaded.

C.9.1 Verifier Window

When the *Verifier* checkbox is selected in the *Main* window (Figure C-2), the *Verifier* window and *Verifier Toolbox* open onto the desktop. When text recognition is initiated, the system displays and highlights questionable characters in the *Verifier* window (Figure C-16). The current character (the one ready for verification) is highlighted (white type in a black rectangle).

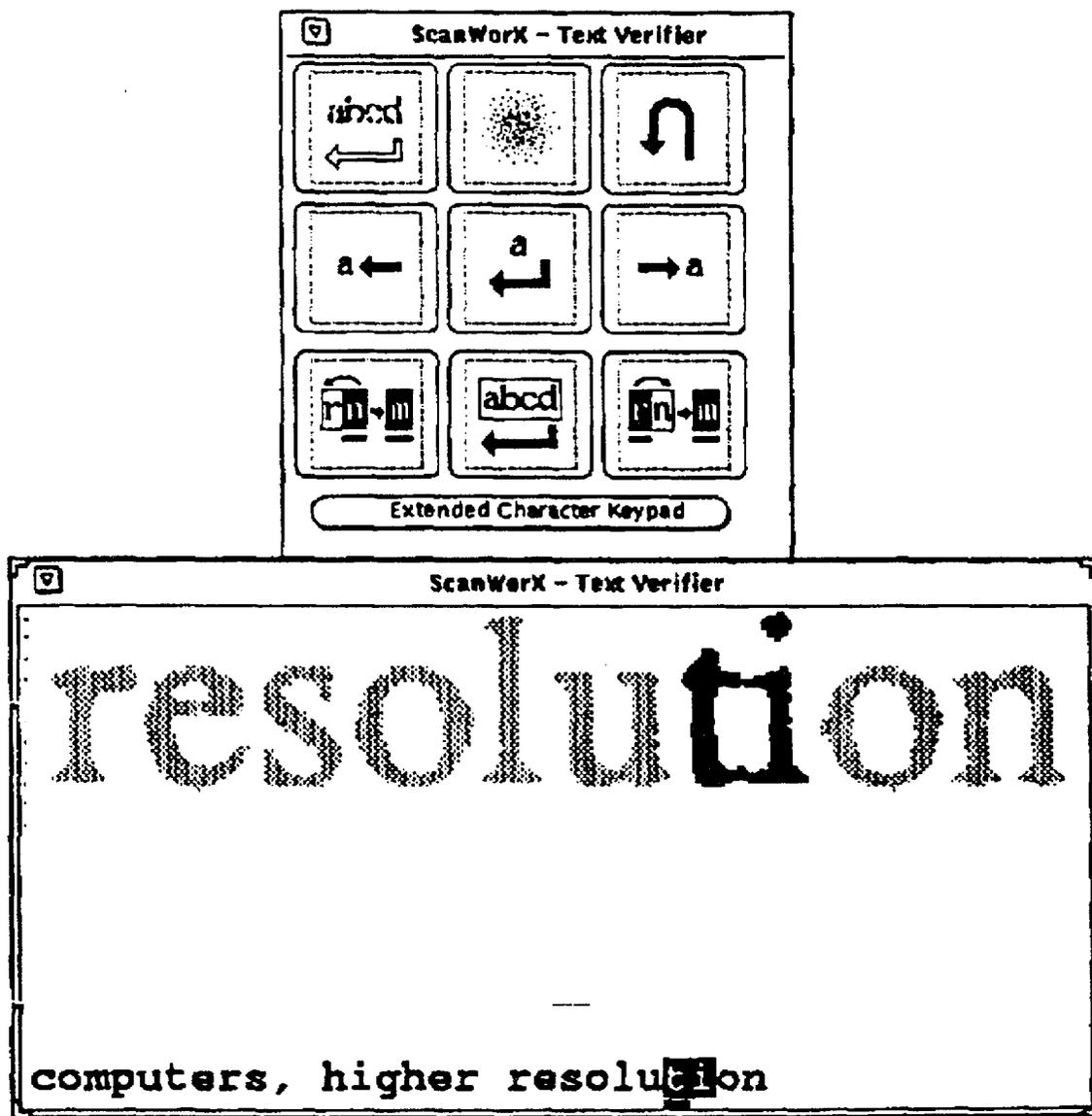


Figure C-16. ScanWorX—Text Verifier window

C.9.2 Verifier Toolbox

Above the *Verifier* window is the *Verifier Toolbox*. The toolbox provides nine icons that can be selected with the mouse to perform the different verification tasks in the *Verifier* window.

The functions of the nine verifier tools are documented below:



Accepts the whole word without saving verification data.



Ignores the highlighted character group, it may be simply noise.



Undoes any operations to the previous entire group.



Moves the cursor left one character within the block.



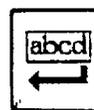
Accepts the character with verification. Character was recognized correctly.



Moves the cursor right one character.



Joins this character (or group of characters) with the previous character. Cursor is now in overstrike mode, and anything typed replaces the characters.



Accepts the entire group with verification.



Joins this character (or character group) with the next character. Cursor is now in overstrike mode.

APPENDIX D

CALERA M/SERIES PROFESSIONAL—SCANNING, OPTICAL CHARACTER RECOGNITION, AND DOCUMENT CLEANUP

D CALERA M/SERIES PROFESSIONAL—SCANNING, OPTICAL CHARACTER RECOGNITION, AND DOCUMENT CLEANUP

D.1 OVERVIEW

The scanning, optical character recognition (OCR), and document cleanup processes involve several distinct steps:

- The document is examined to determine if exception conditions must be accommodated.
- A new or existing document is specified, and the system assigns a job name.
- A user-supplied document name, four characters or less in length, is entered, and options for text and full-page images are selected.
- The pages are placed in the document feeder or on the scanner bed and scanned.
- Pages are zoned as required to designate areas of text versus areas that contain images.
- Pages of text are accessed through a special editor to correct scanning/OCR errors.
- The corrected text is exported to the file system, along with any associated images, for loading into the full-text and image repositories.

The scanning process is initiated from the *SCAN and OCR* entry in the *Operations* pull-down menu (Figure D-1) on scan capable workstations. If the workstation is not scan-capable (does not have the appropriate scanner and software installed) this option does not appear. Select the *Operations* entry from the *CDOCS Main Menu*. The *Operations* pull-down menu appears. Select the *SCAN and OCR* entry in the *Operations* pull-down menu, and the scanning facility is started.

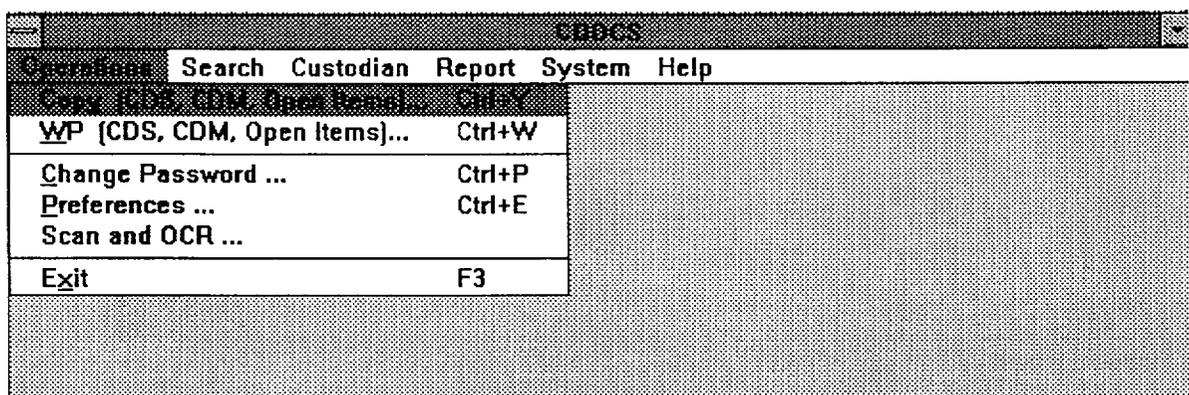


Figure D-1. CDOCS—Operations pull-down menu

D.2 STARTING THE SCANNING OPERATION

The *M/Series Pro* initial scanning screen is illustrated in Figure D-2. This screen includes a menu bar at the top with entries for *File*, *Edit*, *Tools*, *Options*, and *Help*, and an action bar containing icons for the most commonly used functions.

D.2.1 The M/Series Pro Menu Bar

The *M/Series Pro* *File* pull-down menu is illustrated in Figure D-3. This pull-down menu has options for *New*, *Open Document*, *Close Document*, *Delete Document*, *Retrieve Settings*, *Save Settings As*, and *Exit*. Mnemonics for each option are indicated by an underscore. The accelerator key for each option is indicated at the right of the option.

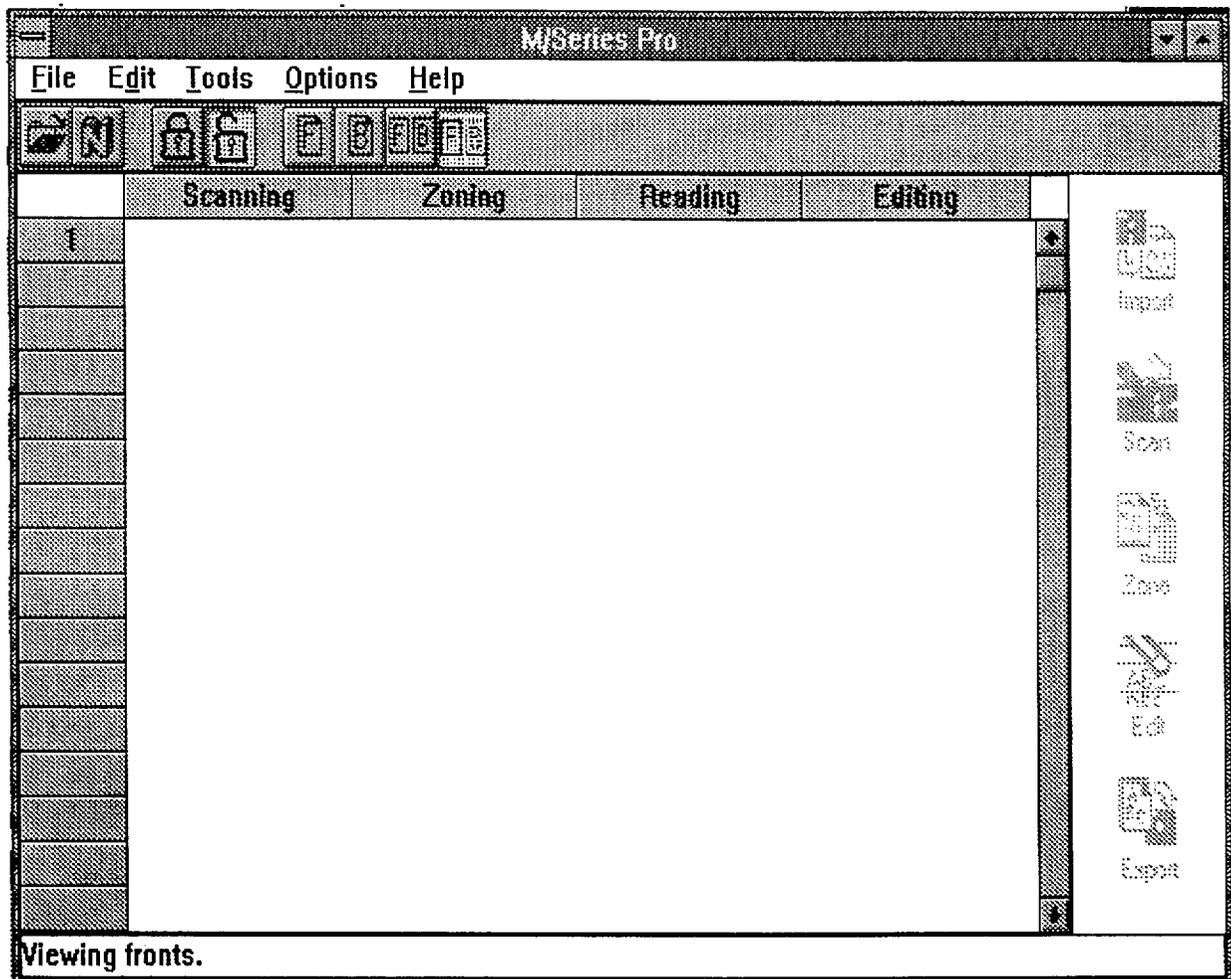


Figure D-2. *M/Series Pro*—initial scanning screen

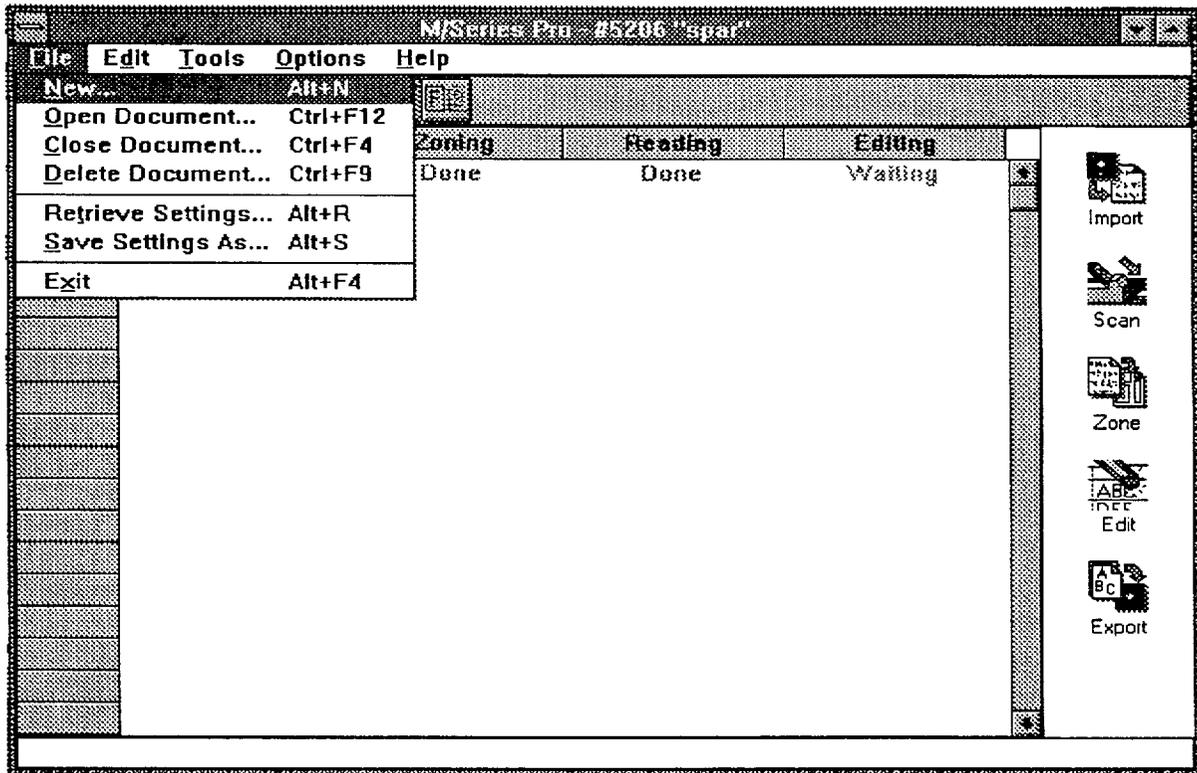


Figure D-3. M/Series Pro—File pull-down menu

New—This option is used to create a new document. This option is also available as an icon on the action bar.

Open Document—This option is used to open an existing document for additional processing. This option is also available as an icon on the action bar.

Close Document—This option is used to close and save the current document.

Delete Document—This option is used to delete an existing document.

Retrieve Settings—This option is used to retrieve a named set of settings.

Save Settings As—This option is used to save the current settings with a new name.

Exit—This option is used to exit from the scanning process.

The M/Series Pro *Edit* pull-down menu is illustrated in Figure D-4. This pull-down menu has options for *Lock Document*, *Clear*, *Delete*, *Insert*, *Page Attributes*, *Document Settings*, and *Rebuild Document*. Mnemonics, where available, are indicated by an underscore. The accelerator keys are indicated at the right of the option.

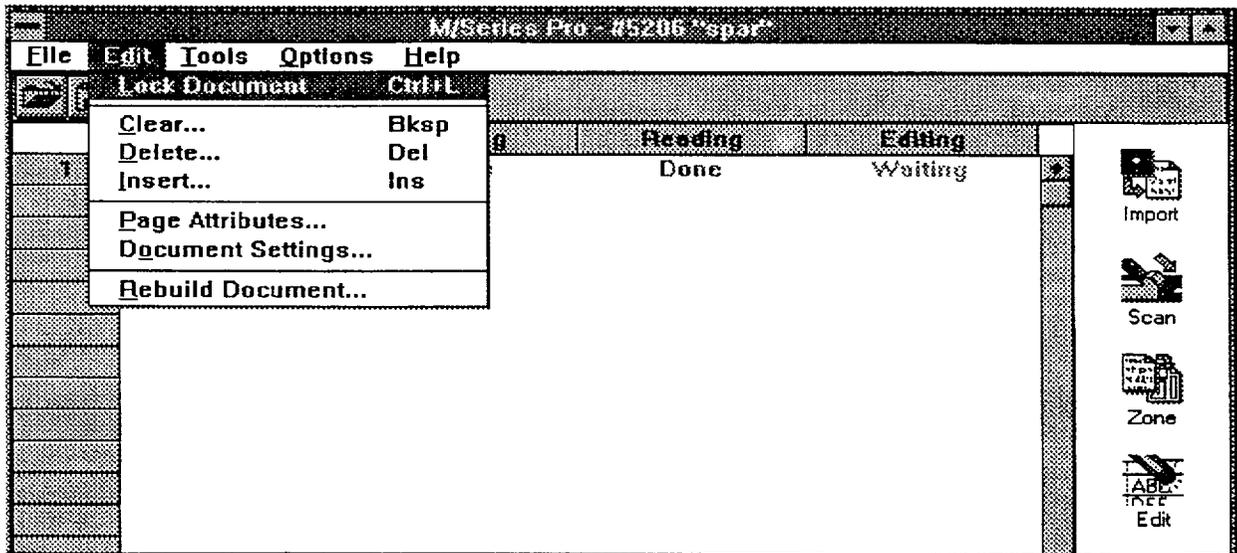


Figure D-4. M/Series Pro—Edit pull-down menu

Lock Document—This option is used to lock or unlock a document. The option works as a toggle switch because selecting this icon reverses the locked status. When the document is locked, a check appears to the left of the option. When the document is unlocked, the check does not appear at the left of the document. This option is also available through icons on the action bar.

Clear—This option is used to clear the status of one or more scanning/OCR functions within a selected page or document.

Delete—This option is used to delete a page within a document.

Insert—This option is used to insert a new page in a document.

Page Attributes—This option is used to display an option screen for setting page attributes.

Document Settings—This option is used to display an option screen for entering document settings.

Rebuild Document—This option is used to display an option screen for rebuilding a document.

The *M/Series Pro Tools* pull-down menu is illustrated in Figure D-5. This pull-down menu has options for *Import*, *Scan*, *Zone*, *Edit*, and *Export*. Mnemonics are indicated by an underscore. The accelerator keys are indicated at the right of each option

Import—This option is used to import a previously saved image and store it in the selected page. This option is also available as an icon at the right side of the screen.

Scan—This option is used to start the scanning process. This option is also available as an icon at the right side of the screen.

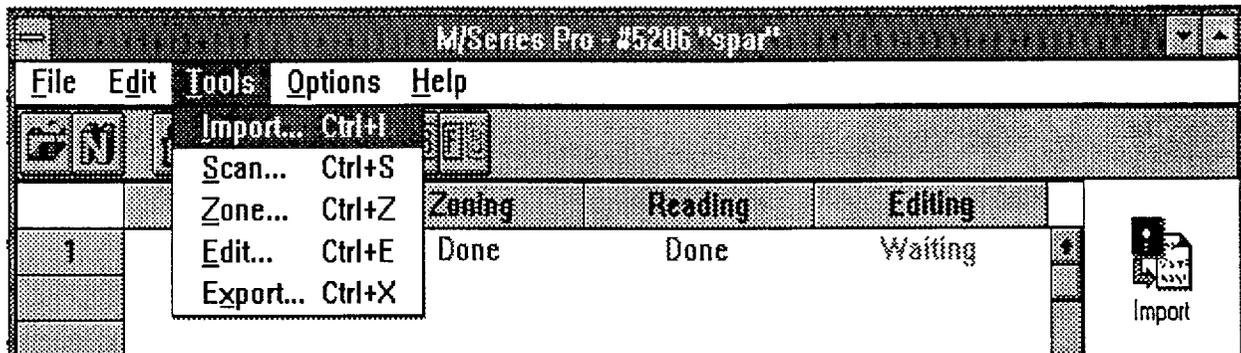


Figure D-5. M/Series Pro—Tools pull-down menu

Zone—This option is used to start the zoning process. This option is also available as an icon at the right side of the screen.

Edit—This option is used to start the editing process for OCR cleanup. This option is also available as an icon at the right side of the screen.

Export—This option is used to export the current document to a named set of text and image files in a specified directory. This option is also available as an icon at the right side of the screen.

The *M/Series Pro Options* pull-down menu is illustrated in Figure D-6. This pull-down menu has options for *Reader Errors*, and *Preferences*.

Reader Errors—This option is used to display a list of scanner errors detected in the current document.

Preferences—This option is used to display an option screen for setting user preferences.

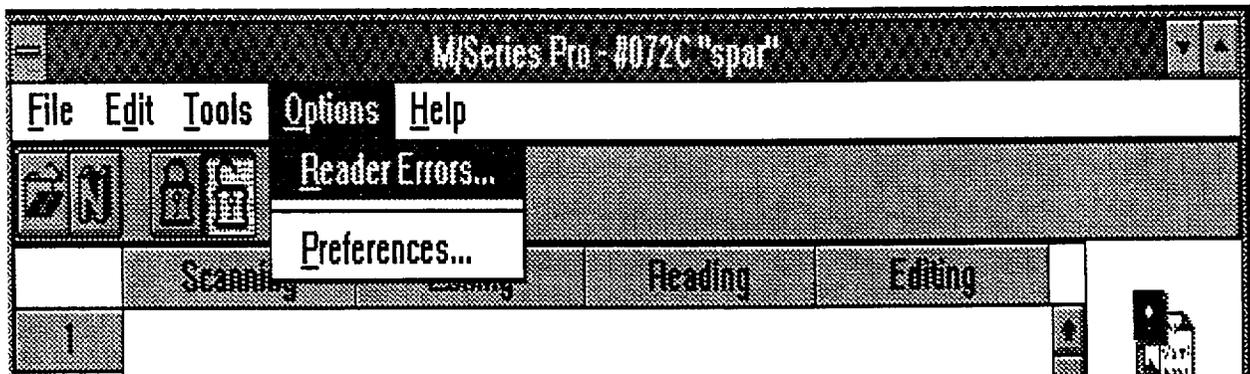


Figure D-6. M/Series Pro—Options pull-down menu

D.2.2 The M/Series Pro Action Bar

Below the *M/Series Pro* menu bar, there is an action bar with icons. The icon functions are:



Open an Existing Document—This icon is selected if an existing document is being updated with newly scanned pages. Selecting this icon causes the document to be opened.



Open a New Document—This icon is selected if a new document is being submitted for scanning and OCR. This is the normal selection for most documents. Selecting this icon causes a new document to be opened.



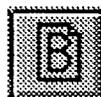
Lock a Document—This icon is selected to lock an existing unlocked document. The appearance of the locked and unlocked icons indicates the current status of the document. If the document is locked, this icon is highlighted, and the icons at the right side of the screen are shaded to indicate that their functionality is not available.



Unlock a Document—This icon is selected to unlock an existing locked document. The appearance of the locked and unlocked icons indicates the current status of the file. If the document is unlocked, this icon is highlighted and the icons at the right side of the screen are not shaded. This indicates that their functionality is available. This icon is initially highlighted to indicate that it has been selected as the default value.



Scan the front sides of the pages—This icon is selected if only the front sides of the pages are to be scanned. This icon is initially highlighted to indicate that it has been selected as the default value. Unless a different icon in this group is selected from the action bar, only the front sides of the document pages will be scanned.



Scan the back sides of the pages—This icon is selected if only the back sides of the pages are to be scanned.



Scan the front and back sides of each document page—This icon is selected if both the front and back sides of the pages are to be scanned, alternating front and back sides.



Scan the front sides of all pages in the document and then all the back sides—This icon is selected if both the front and back sides of the pages are to be scanned, scanning all of the front sides first and then all of the back sides.

The center of the *M/Series Pro* initial scanning screen contains an information display area with columns for *Scanning*, *Zoning*, *Reading*, and *Editing*. This portion of the screen is updated with the status of each page as the *Scanning*, *Zoning*, *OCR*, and *Editing* processes are performed.

The right side of the *M/Series Pro* initial scanning screen contains the following icons that are used to start various functions. These icons are shaded initially to indicate the functions are not available until a new document has been selected or an existing document has been opened.



Import

Import— Retrieve one or more existing images for processing



Scan

Scan—Initiate scanning of document pages



Zone

Zone— Specify areas of document pages as text or image



Edit

Edit— Correct OCR errors



Export

Export— Convert the format of the internal text/image files and store the output text and image files in a directory specified by the user

D.2.3 Selecting the Document and Options

Before scanning can be started, a document must be made available to hold the scanned text and/or images for the scanned pages. The document may be made available by either: (i) opening an existing document, or (ii) creating a new document. In most instances, a new document is created by selecting the *New* icon from the *File* pull-down menu or the *Open a New Document* icon from the action bar.

The type of page scanning (i.e., front, back, front/back, etc.), must also be selected from the action bar.

If *New* is selected, the *Document Settings* entry screen will appear (Figure D-7). The system assigns a job number which is an internal unique identifier for the data. The job number is displayed on the screen following the *Job #* prompt. This job number cannot be changed on the screen but it should be noted for future reference.

An input field is provided following the *Document name* prompt for entry of a name for the document. While the document name can be longer, a four-character identifier for the document is strongly recommended. This four-character identifier is the user-assigned document name, and it must be unique. It is used as the name of the output text file, and it is also used as the first four characters of the names of any associated image files. Entry of the document name is further described in Section D.2.4.

A drop-down selection field is provided below the *Document name* field for setting the *Priority*. The *Priority* field has a default value that is not normally changed.

An entry field is provided below the *Priority* field for specifying the *User Dictionary* file for the spelling checker. The *User Dictionary* field contains a default dictionary name that is not normally changed. If the *Change* push-button is selected, the *User Dictionary* option screen will appear (see Figure D-8). The upper pane of this screen permits the user to: (i) select from a list of existing dictionaries, (ii) create a new dictionary, or (iii) delete an existing dictionary. The lower pane of this screen permits the user to *Add*, *Delete*, *Replace*, or *Import* words into the currently selected dictionary.

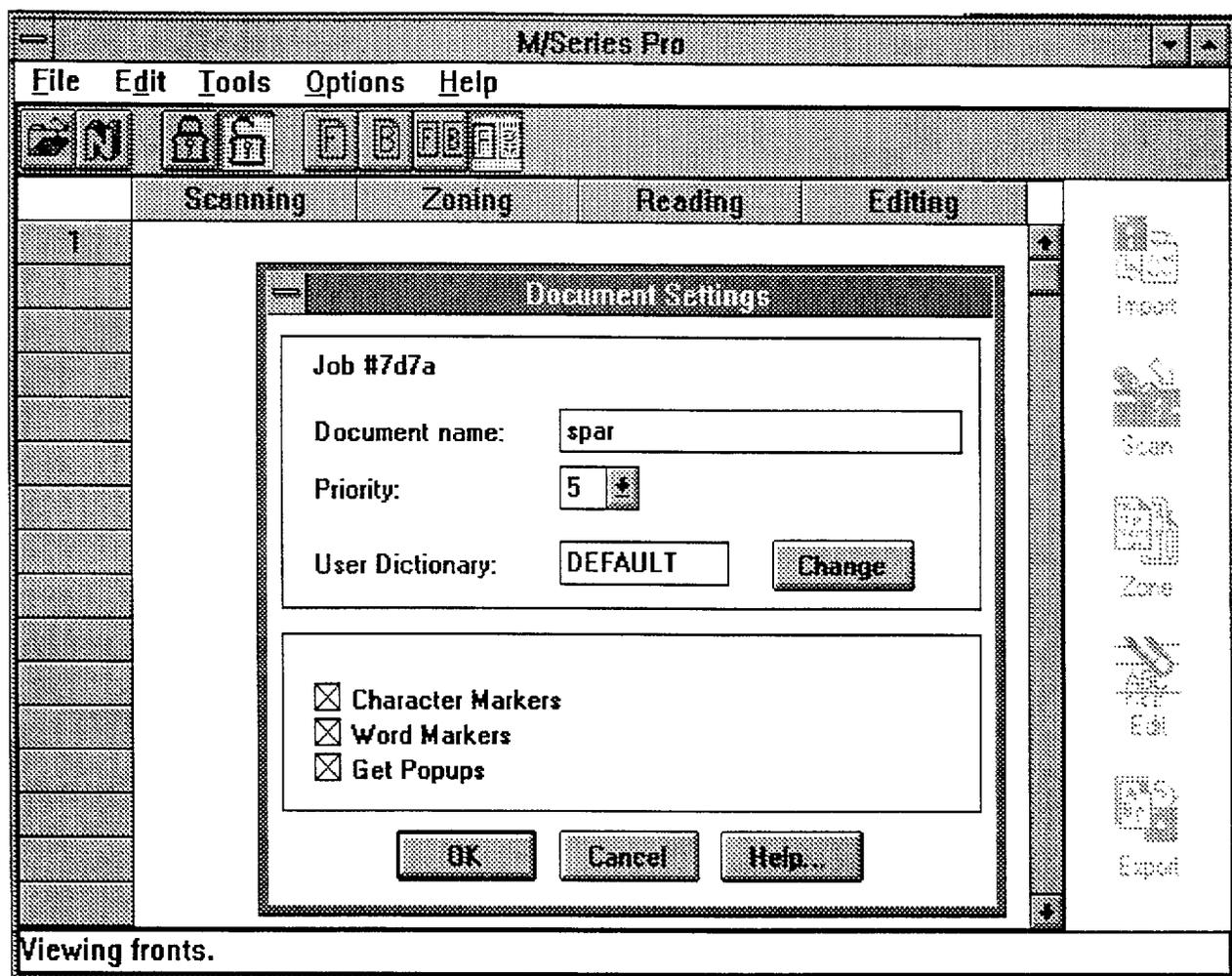


Figure D-7. M/Series Pro—Document Settings screen

In the group area in the lower part of the *Document Settings* screen (Figure D-7) there are three check boxes that control the display of diagnostic information pertaining to OCR errors:

Character Markers—If this option is selected the system will mark ambiguous characters that may have caused an OCR error.

Word Markers—If this option is selected, the system will mark words that the spelling checker found to be in error.

Get Popups—If this option is selected, the system will permit popups of portions of the image to be selected from characters marked as suspected OCR errors.

When all of the document settings have been entered, select the *OK* button to create the new file

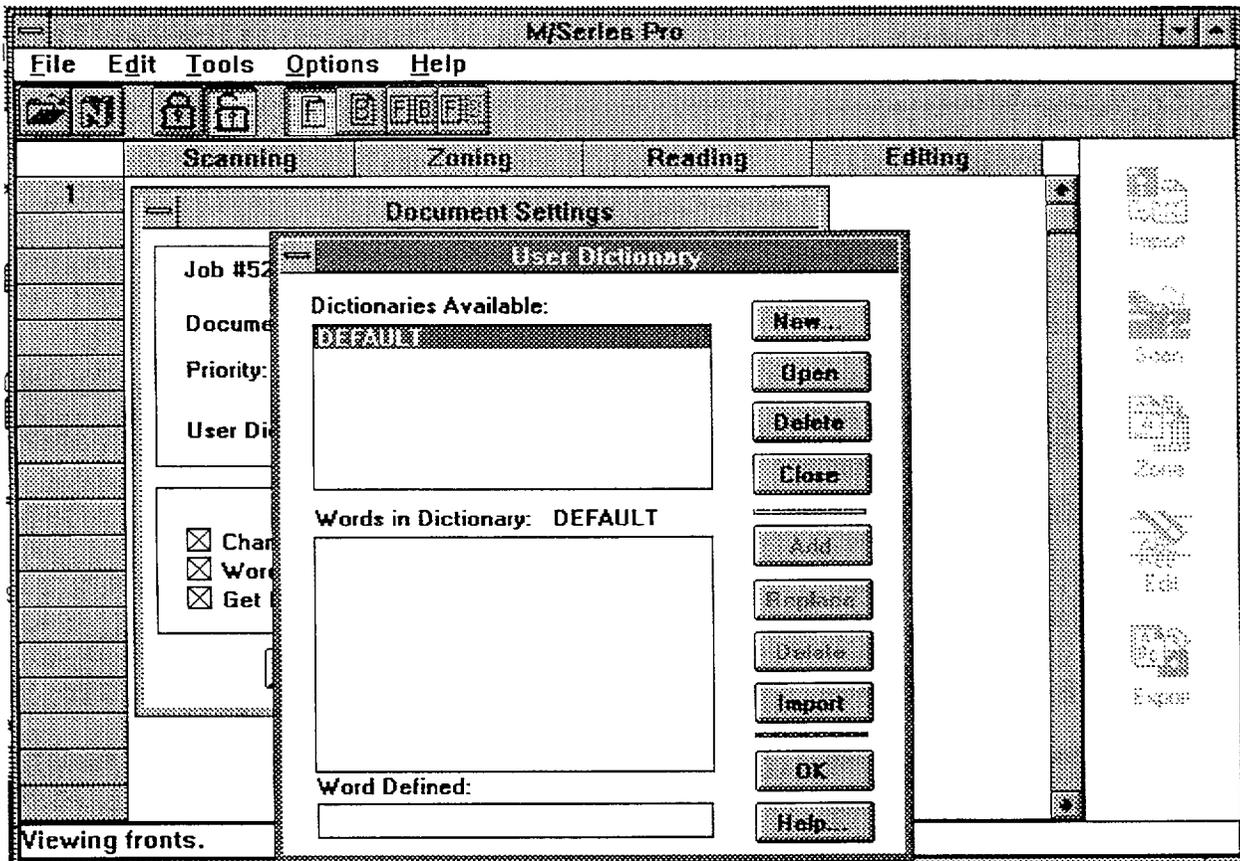


Figure D-8. M/Series Pro—User Dictionary selection screen

D.2.4 Specification of the Document Name

The entered *Document name* is used as the first four characters of the file name for both the text and image output files. Since there can be many image files associated with each document, the system appends a suffix to the four-character document name to form a unique file name for each image. Thus, the document name is limited to a maximum length of four characters. If more characters are entered for the document name, they are truncated. If fewer than four characters are entered, they are not padded, therefore the resulting file name will be shortened.

The following structure is used for the output text file names:

dddd.txt Where—**dddd** is the user-specified document name.

The following structure is used for the output image file names:

dddrrrnA.ttt Where—**dddd** is the user-specified document name.

rrrn is a sequentially assigned number corresponding to the page sequence of the scanned document.

A is an alphabetic suffix sequentially assigned to distinguish additional images within a single page.

*** is a three character file type for the image file (e.g., TIF, GIF, etc.).

D.2.5 Setup for Scanning

Once the new document has been created or the existing document has been accessed, the M/Scan screen will appear (Figure D-9). This screen has a menu bar at the top with entries for *File*, *Edit*, *Options*, *Actions*, and *Help*.

The M/Scan *File* pull-down menu is illustrated in Figure D-10. This pull-down menu has options for *Retrieve Template*, *Save Template as*, *Scanner Selection*, and *Exit*. The mnemonic for each option is indicated by an underscore, and the accelerator key is indicated at the right of the option.

Retrieve Template—This option is used to retrieve an existing document template.

Save Template as—This option is used to save the current document template with a user-specified name.

Scanner Selection—This option is used to select the scanning device.

Exit—This option is used to exit from the scanning process.

The M/Scan *Edit* pull-down menu is illustrated in Figure D-11. This pull-down menu has options for *Undo*, *Delete Zones*, and *Clear Template*. The mnemonic for each option is indicated by an underscore, and the accelerator key is indicated at the right of the option.

Undo—This option is used to reverse the last entry or action.

Delete Zones—This option is used to delete zones defined for the current page.

Clear Template—This option is used to clear the current template.

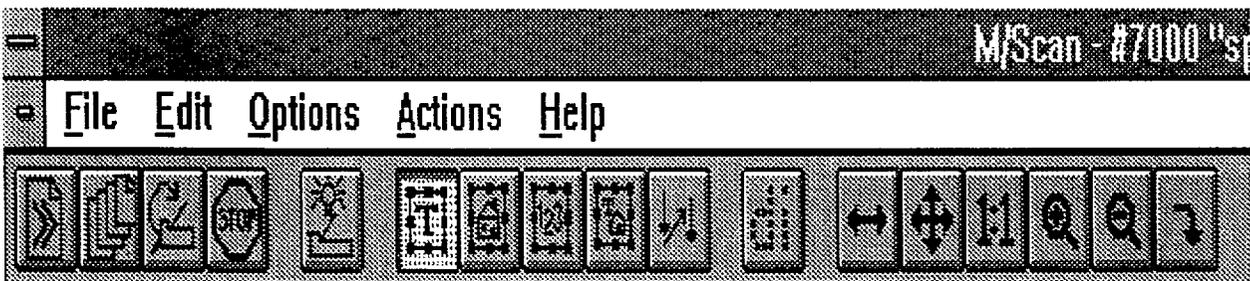


Figure D-9. M/Scan—menu bar

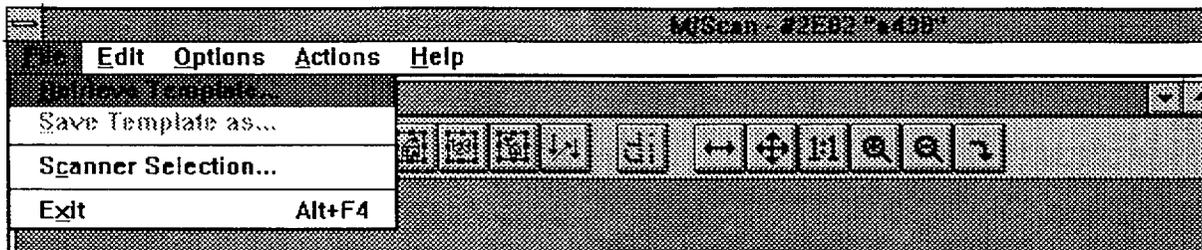


Figure D-10. M/Scan—File pull-down menu

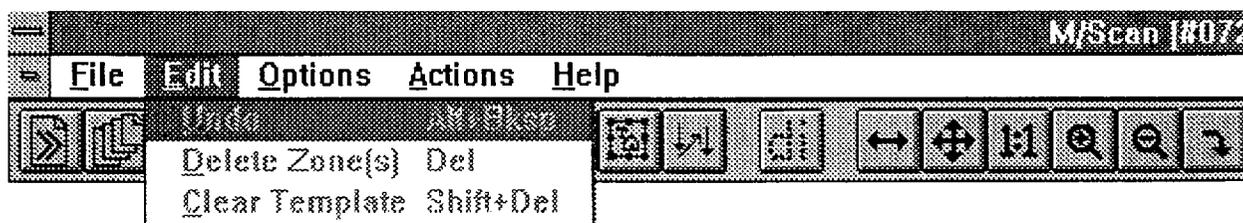


Figure D-11. M/Scan—Edit pull-down menu

The *M/Scan Options* pull-down menu is illustrated in Figure D-12. This pull-down menu has options for *V*iew Settings, *S*canner Settings, *S*how Images, and *P*reserve Template. The mnemonic for each option is indicated by an underscore and the accelerator key is indicated at the right of the option.

*V*iew Settings—This option is used to view the current settings.

*S*canner Settings—This option is used to change the scanner settings.

*S*how Images—This option is used to enable or disable the display of images during scanning.

*P*reserve Template—This option is used to save the current template.

The *M/Scan Actions* pull-down menu is illustrated in Figure D-13. This pull-down menu has options for *N*ext Page, *P*rocess Stack, *R*escan, and *S*top. The mnemonic for each option is indicated by an underscore, and the accelerator key is indicated at the right of the option.

*N*ext Page—This option is used to continue scanning with the next page.

*P*rocess Stack—This option is used to process the remaining document pages in the stack.

*R*escan—This option is used to scan the current page again.

*S*top—This option is used to stop the scanning process.

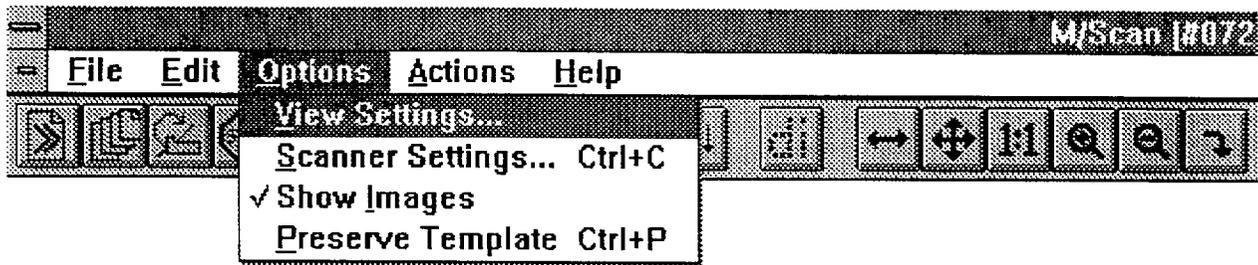


Figure D-12. M/Scan—Options pull-down menu

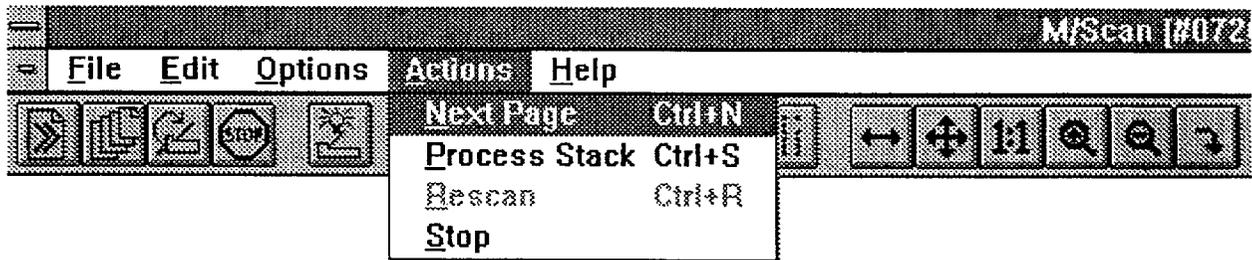


Figure D-13. M/Scan—Actions pull-down menu

Below the menu bar, there is an action bar of icons that are divided into five groups. The icons in the first group control the scanner as follows.



Scan the next page—The scanner is started and scans and processes one page.



Scan a stack of pages—The scanner is started and scans and processes a stack of pages.



Re-scan a page—The scanner is started, and the last page is scanned again.



Stop—The scanning operations are stopped.



Scanning options—A screen is displayed that permits the scanning options to be set or changed.

The next five icons set options for zoning. Four of these five icons have dotted frames. These icons are used to specify the zoning for text and images. One of these four icons should be selected to indicate the type of information on the document page:



Text Zoning—The zoning area contains text without any images.



Image only—The zone contains only images without any text.



Numbers only—The zone contains only numbers without any alphabetic text or images.

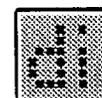


Text and images—The zone contains a combination of text and images.



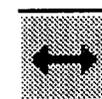
Change zoning order—Selecting this icon causes a zoning order screen to be displayed and permits the order of zoned areas to be changed.

The next icon permits specification of text that was printed on a dot matrix printer.



Dot matrix text—Selecting this icon alternately sets or clears the dot matrix mode. When text is printed on a dot matrix printer, the individual characters are made up of closely spaced dots that may result in OCR errors. When in the dot matrix mode, the OCR software correctly interprets dot matrix text.

The last six icons permit adjustment of the position, size, and orientation of the image.



Full width display—The display of the scanned image is adjusted so that the width of the image fits in the width of the display screen.



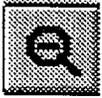
Full-page display—The display of the scanned image is adjusted so that the entire image fits in the display screen.



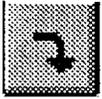
One-to-one display—The display of the scanned image is adjusted so that each picture element (pixel) in the scanned image is represented by one pixel on the display screen.



Magnify the image—The image is increased in size.



Shrink the image—The image is decreased in size.



Rotate the image—The image is rotated 90 degrees in a clockwise direction.

D.2.6 Changing the Scanner Settings

The option to change scanner settings is selected from the *M/Scan Options* pull-down menu. While it is not usually necessary to adjust the scanner settings, some documents may have particularly light or dark images that must be accommodated. When the *Scanner Settings* option is selected from the *M/Scan Options* pull-down menu, the scanner settings screen is displayed (Figure D-14). This screen permits adjustment of *Brightness*, *Contrast*, *Page Size*, and *Scanning Resolution*.

D.2.7 Selecting the Initial Zoning Options

Default zoning for routine loading includes both text and full-page images. This option is also normally selected for on-demand loading. The *Text and Image* icon is selected from the action bar at the top of the initial scanning screen to designate full-page zoning for both text and image.

D.2.8 Starting the Scanner

Once the initial zoning options have been selected to specify the layout of the pages for both text and image, scanning can be started. A decision needs to be made before starting the scanner about whether to: (i) scan and process pages individually, or (ii) scan and process pages continuously. In general, continuous scanning is only appropriate for documents whose pages have a very high degree of uniformity in their format and are primarily textual in nature. Documents that include many equations, interspersed landscape and portrait pages, or require intervention should have their zoning deferred or should be processed in single-page mode.

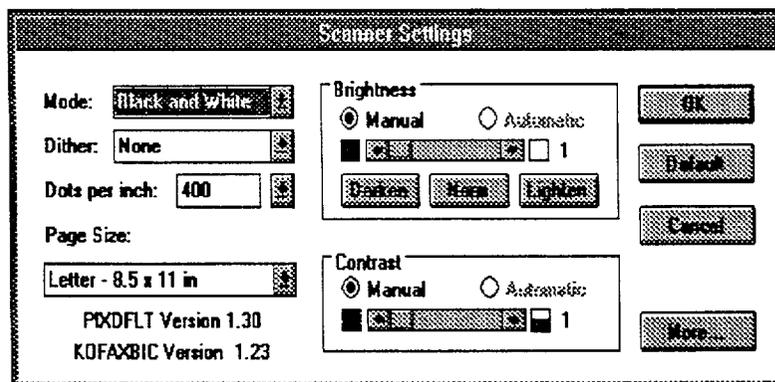


Figure D-14. M/Scan—Scanner Settings screen

D.2.9 Scanning Unbound Documents

If the document is not bound, the pages should be placed face down in the document feeder with the tops of the pages against the scanner head. Depending on whether the document is printed on one or both sides of the pages, the appropriate scanning option icon should be selected to either: (i) scan the front of the pages, or (ii) scan the front and back of the document continuously. The scanning operation is started by either: (i) selecting the icon to scan a stack of pages from the action bar, or (ii) by displaying the *Actions* pull-down menu (Figure D-15) and selecting the *Process Stack* entry. Scanning proceeds automatically until all documents in the scanner have been read.

D.2.10 Selecting Zoning Options

If no zoning options have been selected, a pop-up screen will appear that allows selection of zoning options (Figure D-16). The options displayed on this screen depend on the initial zoning options selected for the document. If the *Text Only* icon was selected, then the *Full-Page* option on this screen will specify full-page text. If the *Text and Image* icon was selected, then the *Full-Page* option on this screen will specify full-page text and images. The option selected on this screen is very important because it will affect the way the OCR process is performed.

Defer—If this option is selected, zoning will be deferred until the scanning has all been performed. This option provides the greatest flexibility in zoning because each page image is available for zoning before the OCR process is started for that page. However, if this option is selected, the text and full-page image must be individually zoned for each page.

Full-Page—If this option is selected, the default zoning selected for the document will be applied to all pages, and OCR will be performed automatically for each page as it is scanned. This option is appropriate for documents with highly uniform pages that are mostly textual in content. However, if this option is selected, the text and full-page images will be zoned automatically for each page, and there will be no opportunity to override that zoning for unusual pages prior to the OCR process.

D.2.11 Scanner Intervention Options

The scanner always tries to read from the document feeder. If the feeder is empty, a pop-up screen will appear to permit selection of the next action to be taken by the scanner (Figure D-17).

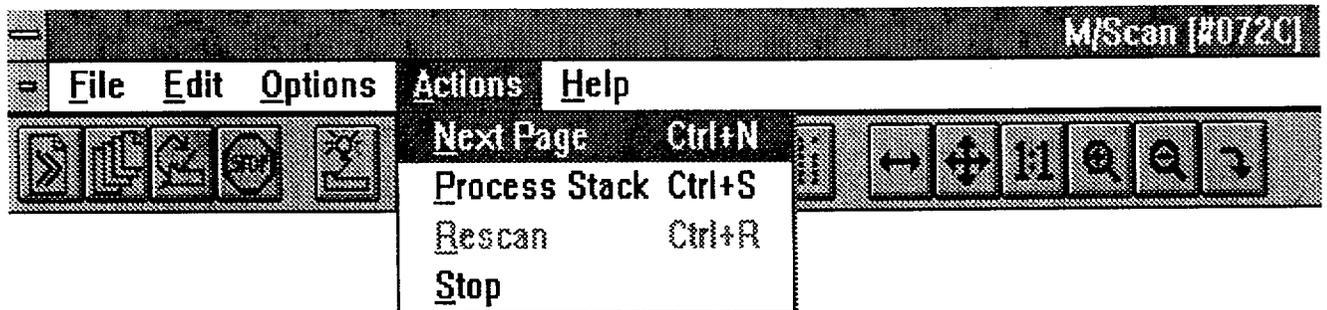


Figure D-15. M/Scan—Actions pull-down menu

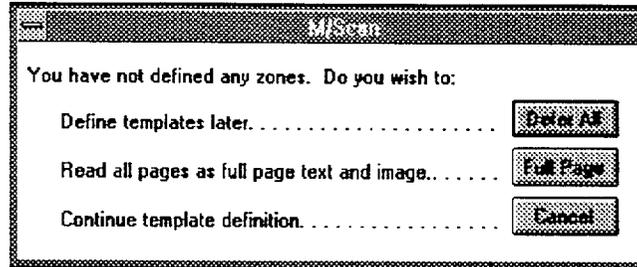


Figure D-16. M/Scan—zoning specification options

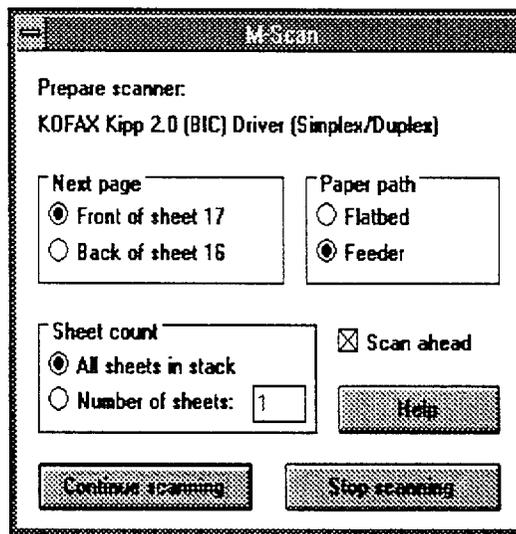


Figure D-17. M/Scan—scanner intervention options screen

- The radio buttons in the *Paper path* group box permit selection of either the document feeder or the flatbed scanner.
- The radio buttons in the *Next page* group box permit selection of the front or back of pages. When both sides of the document pages are being scanned, the fronts of all pages are scanned first. Then, the *Back of sheet...* option is selected, and the backs of the pages are scanned in reverse order. This approach facilitates the use of the document feeder. The front sides of all pages are scanned first. Then the entire stack is turned over and passed again through the

document feeder. This results in the back side of the last page being scanned, followed by successively lower pages until the back side of the first page has been scanned. The order of the pages is very important because the text and images will be associated with the system generated page number as determined by the scanning order.

- The radio buttons and entry field in the *Sheet count* group box may be selected to scan all of the pages in the stack or only a specified number of pages.
- The *Scan ahead* option permits scanning to continue while OCR for previous pages is running.
- The *Continue* scanning button may be selected to continue scanning after adjusting scanning intervention options and/or placing more pages on the scanner. When all pages have been scanned, the *Stop scanning* button is selected to terminate the scanning operation. Scanned Image Displays

As each page is scanned, the image is displayed (Figure D-18). If continuous scanning has been requested, the image for each page is displayed, but the scanning operation does not stop until intervention is required on the scanner.

If continuous scanning was not requested, the system stops after each page has been scanned, and the image is displayed for review and zoning. The scanning operation may be resumed by selecting the icon to scan a single page from the action bar or by displaying the *Actions* pull-down menu and selecting the *Next Page* entry. Scanning will then proceed for the next page. This process is repeated until all pages have been scanned.

D.2.12 Automatic Numbering of Document Pages

The output of the scanning process is a collection of text and image files with appropriate markers for known and suspected scanning and OCR errors. The files created for each page by the scanning and OCR processes are not immediately available for external use because they contain error indicators and links between the text and image. These internal format files are used as input to the *Edit* and *Export* processes.

The sequence in which the documents are scanned determines the page numbers. The text/image files are numbered consecutively as the pages are scanned, and they are listed with these numbers in the scanning status screen. Therefore, to avoid confusion and improper sequencing of the output text file, it is important that the pages of the document be scanned in the proper order. Missing pages also cause problems because the pages following the missing page will be assigned incorrect page numbers. If pages are missed, they may be scanned later and inserted, but it is preferable to assure that the input document is complete and in the correct sequence before scanning it.

D.2.13 Zoning Options

If continuous feeding was selected, scanning will proceed until the document feeder is empty. Then the scanner intervention screen will display (Figure D-17). If the *Stop* scanning option is selected, the scanning operation terminates, and the zoning and OCR processes begin. If no zoning options were selected, another option screen will display that permits selection of zoning options for the images (Figure D-19). The default for the system is to scan and store a single full-page image for each page of text.

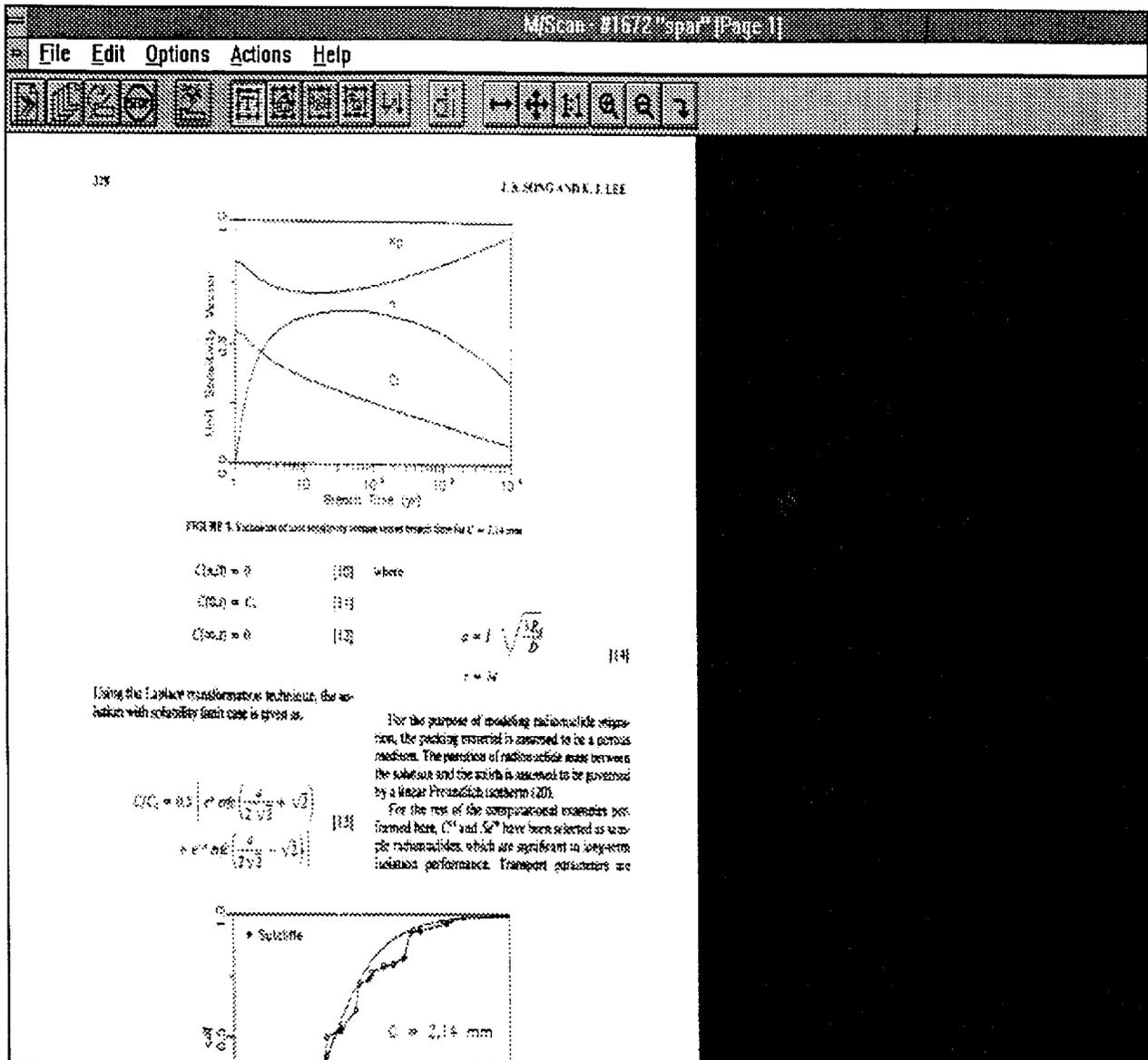


Figure D-18. M/Scan—document image display during scan

Therefore, for documents that contain text only without many equations or figures that might cause OCR errors, the *Full-Page* option should be selected. However, if the format of the pages is highly variable or if there are equations or figures that require zoning, the option to *Defer* zoning should be selected.

D.2.14 Document Status Display

Scanning is normally performed in a way that produces a single full-page image for each page. The output of the scanning/OCR process is a series of text and image files corresponding to the content of each page. The image files are given names, as described in Section D.2.4, that are based on a combination of the document name, the page sequence number, and an image sequence letter.

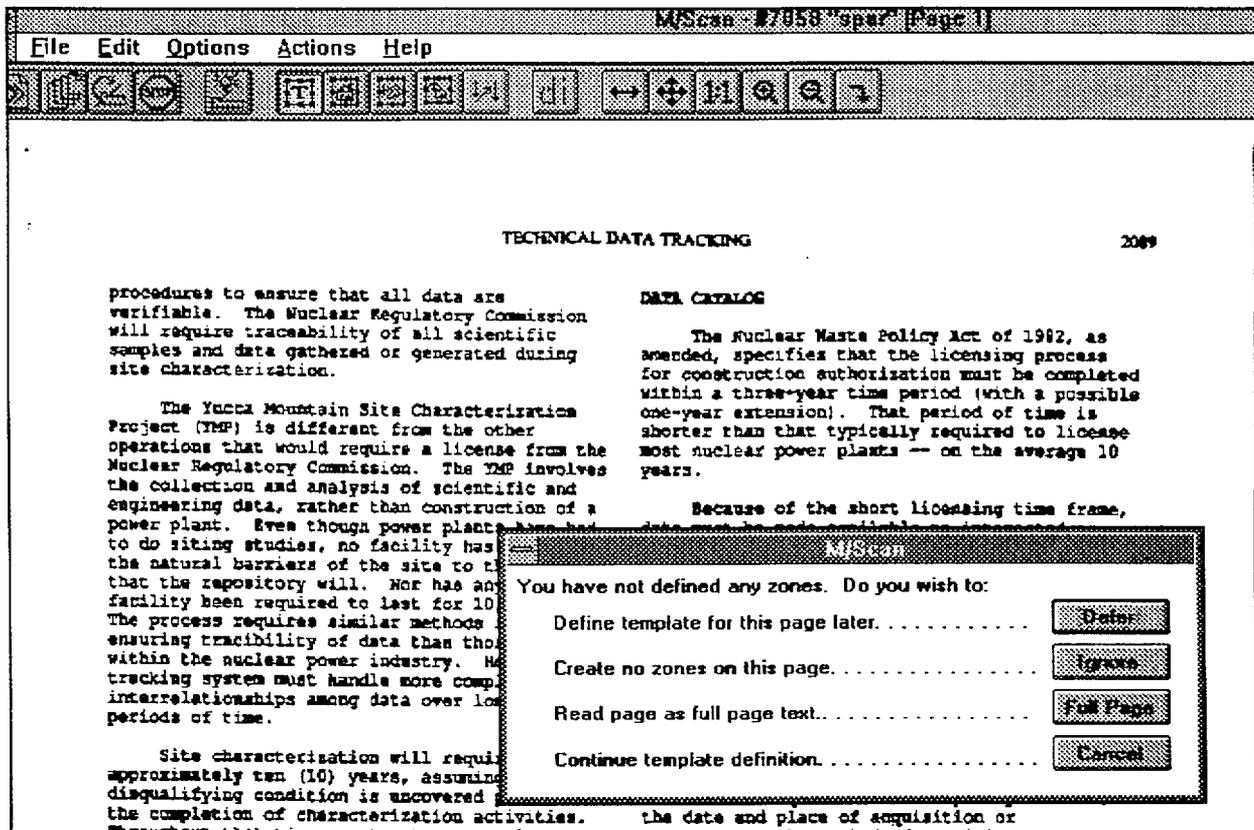


Figure D-19. M/Scan screen—zoning specification options

Scanning is followed automatically by the zoning and OCR processes. As the scanning, zoning, and OCR processes are performed, a status screen is updated (Figure D-20). This screen contains a column of numbers on the left that indicates the scanned page sequence. Four additional columns correspond to the four major steps in the scanning/OCR process.

Scanning—This column indicates the scanning status for each page. When a page has been successfully scanned, the word “Done” appears in this column for the page.

Zoning—This column indicates the zoning status for each page. When a page has been successfully zoned, the word “Done” appears in this column for the page.

Reading—This column indicates the OCR status for each page. When a page has been successfully processed for OCR, the word “Done” appears in this column for the page.

Editing—This column indicates the editing/cleanup status for each page. When a page has been successfully scanned, zoned, and processed for OCR, the word “Waiting” appears in this column for the page. After the page file has been processed by the editor, the word “Done” appears in this column for the page.

	Scanning	Zoning	Reading	Editing
1	Done	Done	Done	Waiting
2	Done	Done	Done	Waiting
3	Done	Done	Done	Waiting
4	Done	Done	Done	Waiting
5	Done	Done	Done	Waiting
6	Done	Done	Done	Waiting
7	Done	Done	Done	Waiting
8	Done	Done	Done	Waiting
9	Done	Done	Done	Waiting
10	Done	Done	Done	Waiting
11	Done	Done	Done	Waiting
12	Done	Done	Done	Waiting
13	Done	Done	Done	Waiting
14	Done	Done	Done	Waiting
15	Done	Done	Done	Waiting
16	Done	Done	Done	Waiting

Figure D-20. M/Series Pro—status display following optical character recognition

The edit/OCR cleanup process normally follows the scanning, zoning, and OCR processes. It is important to do the edit/cleanup function immediately while the source document is available for visual reference, but the editing does not start automatically. It must be started by selecting the Edit icon at the right of the status screen.

Although the individual lines in the status display may be selected for some functions (e.g., *Clear*), the system does not permit zoning or editing files out of sequence. When editing is started, the system accesses each file with a status of “waiting” in the *Editing* column. When the file has been edited and saved, the status is changed to “Done” in the *Editing* column. Thereafter, the file cannot be edited again with the OCR editor.

D.3 ZONING OF INDIVIDUAL PAGES

Document pages, such as the one illustrated in Figure D-21, that contain text, images, and/or equations may require individual zoning to minimize OCR errors. The OCR process normally uses the entire page image as input, but individual zoning may be required if the image contains features that may cause the OCR software to misinterpret the characters, these include:

- Greek characters and mathematical symbols frequently found in equations
- Text with unusual orientations, such as feature labels on maps
- Text with both horizontal and vertical orientations, such as labels on figures and graphs



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J. S. SONG AND R. J. LEE

Geosphere transport to the accessible environment.

Estimation of potential radionuclide releases from the waste package system of a nuclear waste repository is required for two reasons: (a) compliance of engineered barrier system performance with NRC regulation, and (b) providing radionuclide source term to predict the isolation performance of the natural barriers (BPA standard). Due mainly to the inherent variability of the factors relating to the waste form, container integrity, packing material properties, and the host rock environment, and the difficulty in characterizing such variability, it is recognized that significant uncertainties exist in the quantitative description of the various processes that govern the performance of the waste package system. A probabilistic modeling methodology would be advantageous under such conditions because it permits the evaluation of the effect of uncertainties on model predictions.

Single Container Lifetime

The containers are assumed to be made of low-carbon steel and to fail by uniform corrosion. Here, failure is assumed to mean that the waste becomes accessible to the fluid in the repository. From the experiments, a set of empirical equations for the corrosion rates as a function of time for discrete regimes was obtained. To incorporate uncertainty in this estimation of corrosion rates, the coefficients of these equations were assumed to be random variables. A pdf for the failure of a typical container was obtained using the first-order reliability method in the previous section. First of all, a corrosion thickness of container at different times was calculated using the FORM approach [15].

For a typical waste package, the loss of container

In the previous analysis of handling uncertainty by probability tree method [6], the following variables are assumed to be given: $T = 100^\circ\text{C}$, $a = 373\text{ K}$, $K = 0.1706\text{ mm/yr}$, $O = 7\text{ }\mu\text{g/g}$, $\alpha = -1402\text{ K}$, $\beta = 0.2$, $c = 0.543$. For this problem, K , n , and C are assumed to be random variables, X_1 , X_2 , and X_3 , and the FORM methodology is applied to evaluate the probabilistic estimate of the corrosion depth, C . Initially, all the three random variables are assumed to be independent and normally distributed as follows:

$$K: \text{Normal}(4.7, 1.66)$$

$$n: \text{Normal}(0.4677, 0.0313)$$

$$C: \text{Normal}(6.6, 0.8)$$

where the above notation, $N(\mu, \sigma^2)$, is read as random variable X having the normal distribution with mean μ , and standard deviation σ . For $t = 300$ and 1000 yrs, the performance function was formulated such that the analytical solution was compared to an arbitrary target value of C . Here, the reliability index, β , and the estimated probability of failure P_f , associated with target depth values from 0 to 4 mm were calculated. The design point can be determined by using a solving algorithm which minimizes the distance from the origin in the standard space, subject to the point being on the limit-state space [15]. Fig. 1 shows the pdf curves calculated by the FORM method, which closely matches the normal pdf as a fit to the results of Monte Carlo simulations whose mean corrosion depth is 1.05 mm at $t = 300$ yr and 1.88 mm at $t = 1000$ yrs.

After determining the design thickness for the container based on the above analysis, the uncertainty in the failure or breach time is investigated. Using the formula for corrosion depth [Eq. 7], the following equation is assumed to be the deterministic model for the breach time calculation:

Figure D-21. M/Scan—zoning of text area on a page

When these features appear in an image, it is advisable to identify the areas that contain them in order to prevent those areas from being processed by the OCR software. This is done using the zoning capabilities of the system. All document pages are zoned, either automatically by the system or manually by the operator.

D.3.1 Full-Page Zoning

The default mode of operation is to have the system zone pages automatically. This is done by selecting the initial zoning mode and selecting the option to read all pages as full-page text and image (see Section D.2.7). If this default zoning is selected, each page will be zoned automatically, and the zoning and OCR processes will follow scanning without interruption. Therefore, if this option is selected, there will be no opportunity to select special zoning for a particular page. For this reason, full-page zoning is only appropriate for documents in which all pages contain normal text in a consistent format. If the document contains numerous equations or images that may result in OCR errors, full-page zoning should not be selected.

D.3.2 Deferred Zoning

An option is provided to allow the decisions on zoning to be deferred until after scanning is completed. This option is appropriate for documents that contain numerous equations or images of figures that would cause OCR errors. When this option is selected, zoning will be deferred for all pages, and the OCR process will be delayed until zoning options have been specified on a page-by-page basis.

D.3.3 Specifying Areas in a Scanned Image for Zoning

Zoning is initiated by selecting the Zone icon at the right of the document status screen. When the zoning facility is started, it automatically processes all pages that have not yet been zoned (i.e., pages with a status of “waiting” in the *Zoning* column). Pages are processed in sequence, from first to last, and any attempt to select an individual page will result in error messages. Therefore, individual pages should not be selected.

The image of each page with a “waiting” status in the *Zoning* column of the document status screen will be selected and displayed in sequence. By selecting the appropriate zoning icon from the top of the image display screen, areas of the image may be designated as text, image, numbers, or text and image (see Section D.2.5 for a discussion of the zoning icons). When a zoning icon is selected, a cursor that indicates the selected type of zoning appears. This cursor should be positioned at the upper left corner of the area to be zoned, and then, with the left mouse button depressed, the cursor should be dragged to the lower right corner of the area (Figure D-21). A dashed box will be drawn around the zoned area, and the area will be labeled in the upper left-hand corner with the type of zoning (e.g., TXT, IM, etc.), and in the upper right-hand corner with the zoning sequence (e.g., 1,2,3, etc.). The following codes are used to indicate the type of zoning:

- TXT—Text zoning
- IM—Image zoning
- TXT-IM—Text and image zoning
- #—Numeric zoning

- D-TXT—Dot matrix text zoning
- D-#—Dot matrix numeric zoning.

D.3.3.1 Zoning Considerations

Several considerations need to be kept in mind as zoning is specified.

- Zoning should be performed in sequence—The sequence in which text areas are zoned determines the sequence of the text following OCR. There is a provision for altering the sequence of zoned text or inserting a newly zoned area between previously zoned areas, but using this facility requires additional time and effort. Therefore, specification of text zones should proceed in order, top to bottom. If multiple columns of text appear on a page, the left column should be zoned first, top to bottom, and then the right column should be zoned.
- Zone areas from the upper left-hand corner to the lower right-hand corner—The zoning process assumes that the first point identified is the upper left-hand corner of the area, and the second point identified is the lower right-hand corner. If points are specified out of sequence, the image will be inverted or reversed, causing severe OCR errors.
- Specify the zones correctly the first time—There are provisions for changing the zoning after it has been specified, including the ability to adjust the size of the zoning boxes. However, if zoning is specified incorrectly, the zoning corrections require additional time and effort. Therefore care should be taken to specify the zones correctly the first time.
- Leave some white space between the zoning box and the text characters—Each zoning box has black squares, called handles, at the center of the top and bottom and the left and right sides of the box. Any of these handles may be selected and dragged to enlarge or reduce the size of the zoning box in one of its dimensions. Care should be taken to leave some white space between the characters and the zoning box. If the edge of the zoning box is too close to the characters, the image of the characters may be clipped resulting in lost characters or OCR errors.
- The zoning cursor may not appear if the cursor position falls within a previously defined zoning box of the same type. This is because the cursor position may be ambiguous to the software, and it may select the previously defined zone rather than beginning a new zone. Therefore, when defining adjacent zoning boxes of the same type, it is sometimes necessary to initially define the second zoning box somewhat smaller than the text being selected. Then the handles on the sides or top and bottom of the zoning box can be used to expand the box to include the desired text.

D.3.3.2 Zoning for the Full-Page Image

The general approach for documents to be loaded into the permanent database is to store both text and full-page images. When zoning is deferred to permit the requirements of individual pages to be accommodated, the full-page images are not automatically captured. Therefore, after the text has been zoned, the image zoning icon must be selected and the entire page must be zoned for the full-page image. It is important that in zoning the full-page image, that the upper left-hand corner be selected first, followed by

the lower right-hand corner. Selecting corners out of sequence or selecting other corners may result in the image being rotated or reversed.

D.3.3.3 Continuing the Zoning Process

When all zoning operations for a page have been completed, the system must be instructed to: (i) go to the next page, or (ii) suspend the zoning operation. This is done by selecting the *Actions* pull-down menu from the Menu Bar of the *M/SCAN* screen (Figure D-22)

D.3.3.4 Changing the Order of Zoned Areas

Occasionally, zones will be specified out of sequence. If not corrected, this condition will cause the OCR process to produce text that is also out of sequence. Therefore, a facility is available to permit the order of zoned areas to be changed. This facility is accessed by selecting the *Change Zoning Order* icon from the action bar of the *M-Scan* screen. When this icon is selected, the *Change Zoning Order* screen appears (Figure D-23).

D.4 OPTICAL CHARACTER RECOGNITION

As soon as a page has been scanned and zoned, the OCR process is initiated automatically for that page. There are multiple OCR reader processes that are selected automatically by the software. When the OCR process for a particular page is finished, the status for that page is updated in the *Read* column of the status display screen.

D.4.1 Editing and Cleanup of Document Pages

During the OCR process, an internal format text file is created for each page. In these files, the text is flagged with colored markers to indicate the two levels of error:

- Known or suspected scanning and OCR errors are marked with yellow markers.
- Errors detected by the spell checker are indicated by blue markers.

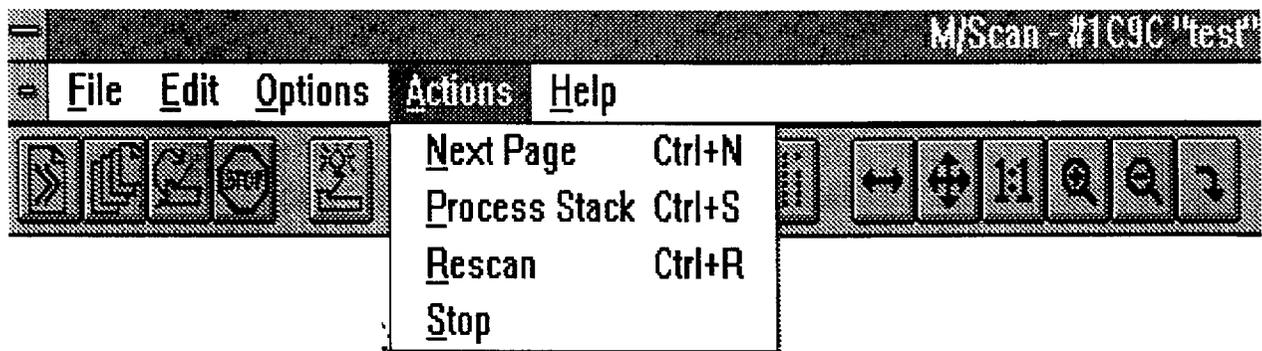


Figure D-22. M/Scan—zoning Actions pull-down menu



TECHNICAL DATA TRACKING

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procedures to ensure that all data are verifiable. The Nuclear Regulatory Commission will require traceability of all scientific samples and data gathered or generated during site characterization.

The Yucca Mountain Site Characterization Project (YSCP) is different from the other operations that would require a license from the Nuclear Regulatory Commission. The YSCP involves the collection and analysis of scientific and engineering data, rather than construction of a power plant. Even though these plants have had to do siting studies, no facility has relied on the natural barriers of the site to the degree that the repository will. Not being an other facility type requires to last for 10,000 years. The process requires similar methods for ensuring traceability of data than those used within the nuclear power industry. However, the tracking system must handle more complex interrelationships among data over longer periods of time.

Site characterization will require approximately ten (10) years, assuming that no disqualifying condition is uncovered prior to the completion of characterization activities. Throughout that time, contractor companies and project personnel will change, as they have during the early evaluation and preparation phases of the program. In addition, samples or data acquired or developed by one contractor or laboratory may be used by one or more other contractors or laboratories for further analysis.

Regardless of changes in personnel, shifts in plans, re-definition of tests, or other variables, there must be a process for identifying and tracking the acquisition and development of data and its use in support of programmatic documentation. The chain of custody must be maintained for samples and for scientific and engineering data. Conclusions must be linked to the data on which they were based -- originating with the raw data and

Because of the short licensing time frame, data must be made available to interested parties in advance of the submission of the license application so that independent investigations may be performed to substantiate or dispute those of the DOE. To facilitate these exchanges, the DOE/NRC Site-Specific Procedural Agreement for Geologic Repository Site Investigation and Characterization (Site Specific Agreement) of June 1985 was developed. One of the provisions of the Site Specific Agreement is that the DOE will provide to the NRC a Site Catalog.

The Site Catalog will include a description of all data acquired or developed by the DOE; the date and place of acquisition or development; the method of acquisition or development; and the location at which the data may be examined. Requests for data are made to the Yucca Mountain Site Characterization Project Office. The provision of data must be tracked to verify compliance with the agreement. Knowledge of the status of particular data collection activities at the time that findings are made available could also be important to discussions with the nuclear regulatory Commission and other interested parties.

Figure D-23. M/Zone—change zoning order screen

These flagged text files are accessed through the edit process, which is started by selecting the Edit icon from the right side of the document status screen. Figure D-24 illustrates a typical page in an OCR text file as it would appear during the editing process.

This sample page illustrates several typical types of scanning/OCR errors:

- The word "Management" contains an extra "i" as a result of a scanning error.

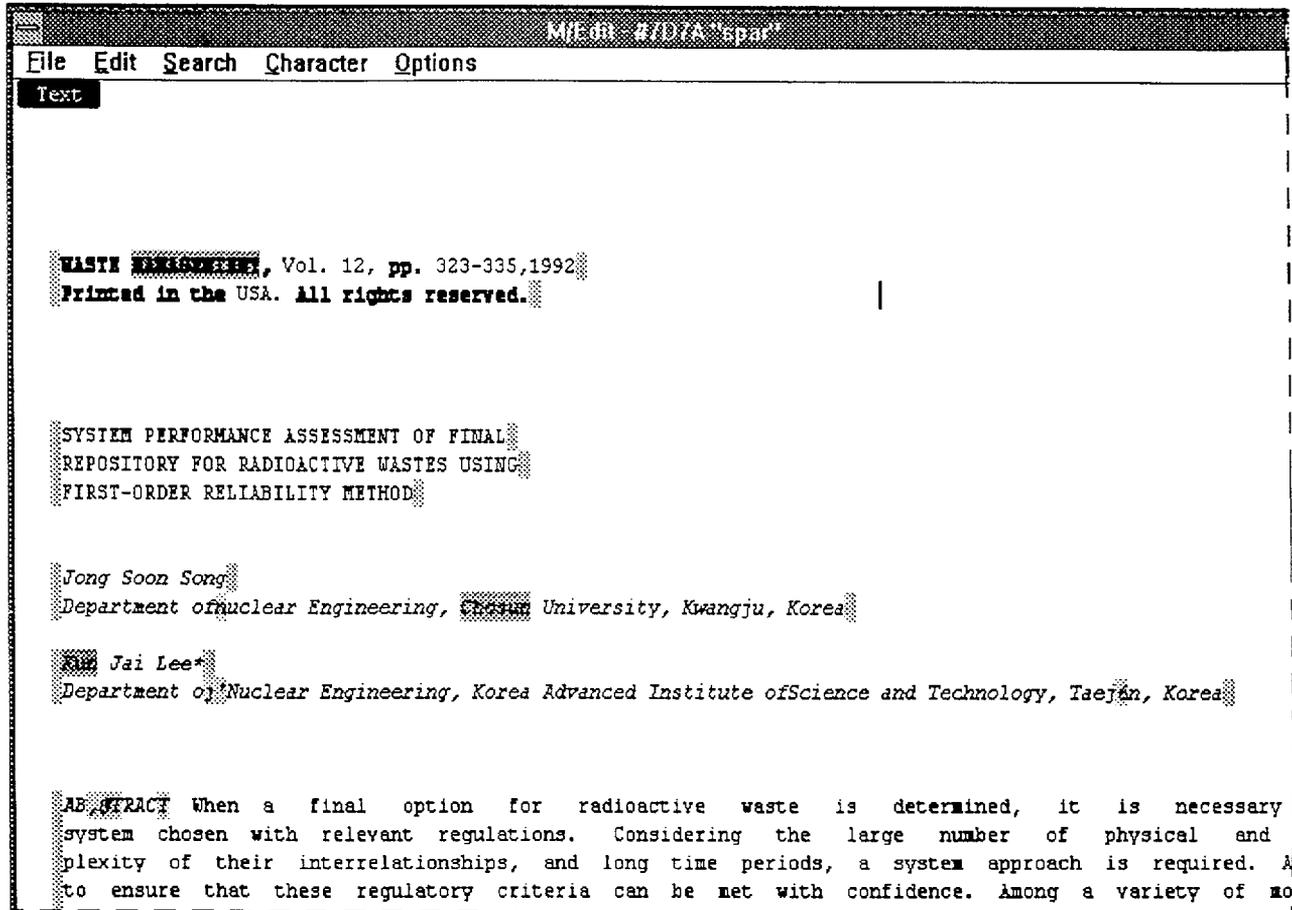


Figure D-24. M/EDIT—edit display for optical character recognition cleanup

- In its first occurrence, “Department of Nuclear Engineering” lost a space character.
- “Chosun University” was flagged by the spell checker, but is actually the correct spelling.
- The name “Kun Jai Lee” was flagged by the spell checker but was correct.
- In its second occurrence, “Department of Nuclear Engineering” misread the word “of”.
- The “o” in “Taejon” was accented and was therefore scanned as a “6”.
- The word “ABSTRACT” was misread.

In this sample page, there are several errors that can easily be corrected. However, the resolution of some of the errors, such as the proper spelling of “Kun Jai Lee,” requires reference to the source document. Therefore, document cleanup should immediately follow scanning and OCR so that the source document will be available for reference to resolve this type of ambiguity.

D.4.2 Use of Pop-up Images to Resolve Scanning Errors

When the OCR process encounters sufficient ambiguity in the interpretation of a character, the location in the text is flagged with a yellow marker and provision is made to pop-up an image of the questionable area. Image pop-ups, such as the one illustrated in Figure D-25, are available during the edit process. To access the image pop-up associated with a particular suspected scanning /OCR error, the cursor is positioned at the yellow highlight and the [Enter] key is depressed.

D.5 DOCUMENT EXPORT

When the scanning, zoning, OCR, and cleanup functions have been completed, the document must be exported to make the text and images available to the user. The system maintains documents in an internal file format that relates each page of text to its associated images. While a document may be saved in this format, it is not fully accessible to the user until it has been exported.

During the export process, the text portions of all pages are combined into a single text file. Each page is accessed in sequence, and within the page, text zones are accessed in sequence. The resulting text file is stored in the directory specified by the user. The first four characters of the user-supplied job name are used as the name of the text file, followed by a file type suffix of "TXT."

Images are extracted, page by page, and stored with the selected image file format in the directory specified by the user. Because there may be multiple images associated with each page, there may be many image files. The names assigned to the image files are structured to indicate the document, page number, and image sequence within the page. Image file names take the form *ddddnnnA*.TIF, where *dddd* is the first four characters of the document name, *nnn* is the page number, and *A* is an alphabetic sequence character distinguishing multiple images on a single page. The file extension (e.g., TIF) indicates the format used for the image file.

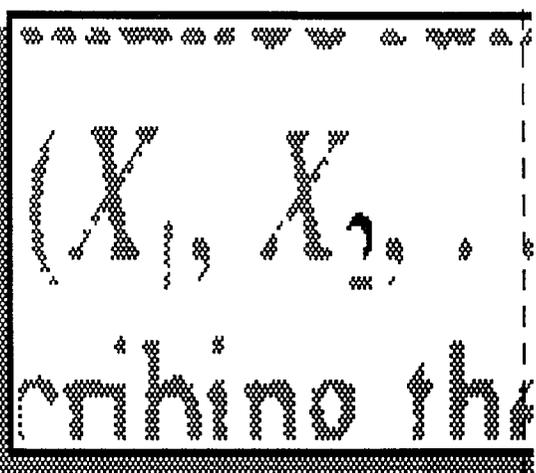
When the *Export* icon is selected, the *M/Export* screen is displayed (Figure D-26). This screen permits the user to specify the directory where the text and image files will be stored, as well as the document name and the format for the image files.

Once a document has been exported, the text and image files are available for use. The user may copy the text and/or image files to a diskette, network disk, or local hard disk where they may be used.

File Edit Search Character Options

tive assumptions caused by the geometry, boundary conditions, and variable variance (1 3). Furthermore, describing the sensitivity of the outcome to the input parameters and their statistics easily obtained.

Theoretically, the method is based on order Taylor series expansion at a specification point to calculate a measure of reliability. A reliability problem is typically formulated as a function describing the performance of interest. In general, the performance function is defined as $Z = g(X)$, when $X = (X_1, X_2, \dots)$ is a vector of random parameters of interest. The failure state is determined by the corresponding Z may be defined against exceeding the performance function. The failure probability is given by:



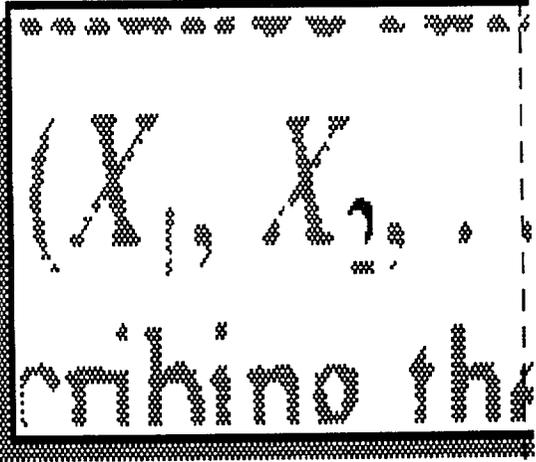
$$P_f = P(g(X) < 0) = P(Z < 0)$$

Figure D-25. Pop-up image for a suspected scanning optical character recognition error

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tive assumptions caused by the geometry, boundary conditions, and variable variance (1-3). Furthermore, describing the sensitivity of the outcome to the input parameters and their statistical properties is easily obtained.

Theoretically, the method is based on a first-order Taylor series expansion at a specific point to calculate a measure of reliability. A reliability problem is typically formulated as a function describing the performance of interest. In general, the performance function is defined as $Z = g(X)$, when $X = (X_1, X_2, \dots)$ is a vector of random parameters of interest. The failure state is determined by the corresponding Z may be defined against exceeding the performance function. The failure probability is given by:



$$P_f = P(g(X) < 0) = P(Z < 0)$$

Figure D-25. Pop-up image for a suspected scanning optical character recognition error