4.0 Managing Relational Data

The relational database contains approximately 190 tables that hold information used by the application software. As described in Section 3.2, Building Relational Data, some of the tables are preloaded with records before the system is deployed. As the system is used, new information is added and some of the initial information may be modified or deleted.

The FEMIS application software, including the models, is largely responsible for managing the information in the relational database. This section discusses the default information in the database and then describes the general purpose query tool that allows users to browse and modify data.

In the FEMIS system, all data access protection is performed by means of user interface windows. The procedures for giving FEMIS users the correct privileges to perform their tasks are provided in the System Administration topic of FEMIS Help.

Security was improved with the v1.4.6 relational database. The FEMIS software uses a database schema that has limited privileges so it is no longer possible to accidentally change the structure of a table or delete a table. Also available, is the capability to change database passwords. This additional security is transparent to users of FEMIS. Section 12.2, Database Security, in the ***FEMIS System Administration Guide*** has more details on security features.

4.1 Site Default Information and Considerations

When the database for a new CSEPP site was created, a set of default information was defined that met the specialized requirements of the site. This information was solicited from the EOC users at the site and was loaded into the EOC_Objective table for each EOC.

The census data is gathered by asking people in residential areas how many people live at that residence. Since most people in a residence are more likely to be at home during the night than the day, these counts best define night time numbers. Also, since many families have routines that are structured around the 5-day workweek, the counts are good indicators of weekday populations while not accounting for the whereabouts of people on weekends or special events. Based on these considerations, the normal condition for population information is weekday, nighttime conditions.

4.2 Data Manager

This FEMIS application has many user interface windows for accessing and managing relational data. The online help function provides a convenient user guide. A collection of the relational tables has no formal user windows and relies on a general-purpose tool to manage the records in them. This section describes how this tool is used and provides guidelines to manage the relational database while FEMIS is in use.

The Data Manager is activated by clicking on Start → Programs → FEMIS → Data Manager. The
FEMIS login window displays and the user must enter a valid username and password for the EOC
database that will be accessed. Then the Data Manager window displays.

The appearance of the window depends on the privileges of the user. Edit privilege for UN.DB_mgr is
required for the full function version shown below. A view only version of the window is displayed if the
user has at least View privilege for UN.DB_mgr. The view only window does not include the Recordset
Type: Edit button or the SQL Statement window. Other differences depend on which Form Type: is
selected prior to opening a FEMIS table.

Figure 4.1. Data Manager Window
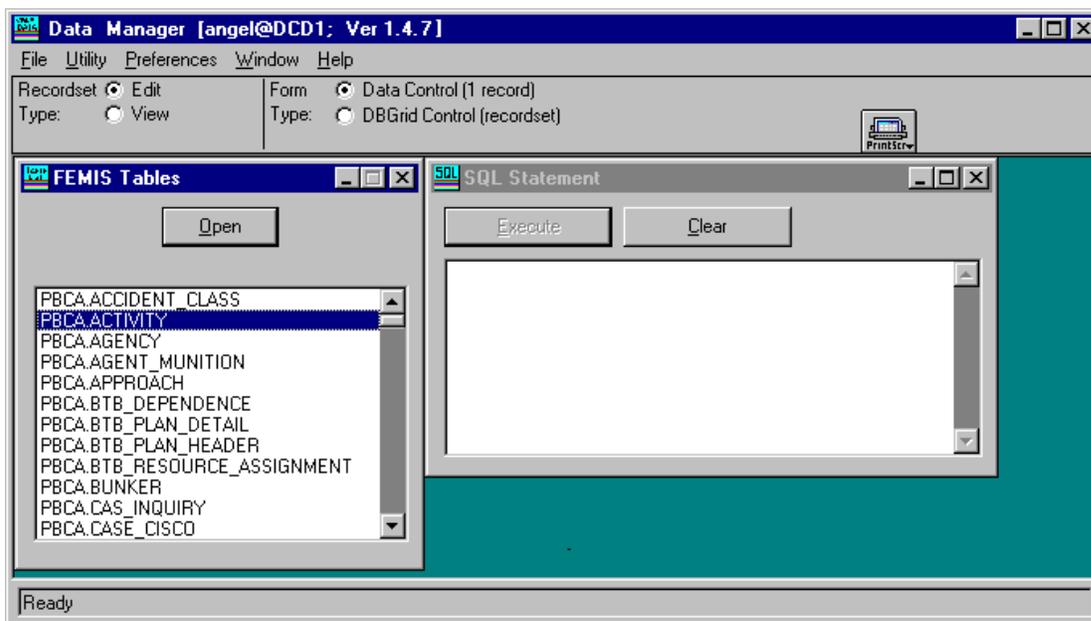
The FEMIS Tables window contains a list of all tables in the relational database which are appropriate to
the user's Recordset Type: selection and the current default EOC. Replicated tables (S_xxx...) are
removed from the list when in Edit mode; system tables and MLOG$ tables are never shown.

The SQL Statement window on the right is used to formulate a user query, but normally it is not used.
You can minimize it by selecting the Close option or by double-clicking on the control box in the upper
left corner of this window.
Regardless of mode, two options exist for viewing the data in a table. This is controlled by selecting a
Form Type. A Form Type: Data Control (1 record) will present the data one record at a time with a Data
Control bar to move from record to record. A Form Type: DBGrid Control (recordset) will present the
data in a spreadsheet format with scroll bars.

Note: The only time records can be edited are when you have selected Recordset Type: Edit and Form
            Type: Data Control and opened the table using the FEMIS Tables window. Otherwise all data is
            read-only.

4.2.1 Data Control

The Form Type: Data Control, which presents a single record at a time for viewing or editing (if in Edit mode), contains some additional command buttons which are sometimes useful. The Add, Update, and Delete buttons (available only in Edit mode) allow editing of the current record in the Data Control window. The Filter, Sort and Move buttons provide search and organization options for viewing the data regardless of mode. The Refresh button will requery the database and all previous sorting and filtering activities will be cleared. The Close button will close the window and prompt you to commit changes, if any were made.

> **Note:** Tables with more than 40 fields cannot be seen in the Data Control window and cannot be edited.

**Figure 4.2**. Data Control on the Data Manager Window
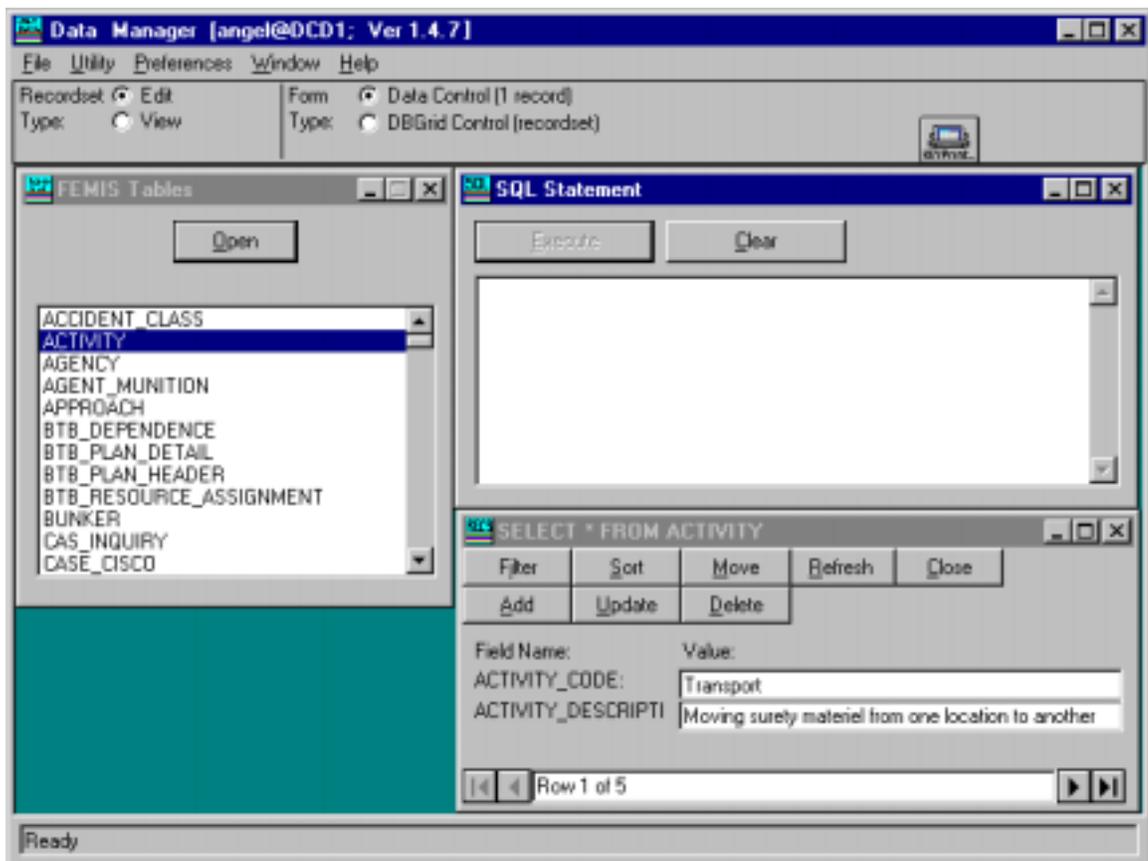
4.2.2 DBGrid Control

To view multiple records, select the DBGrid Control radio button and select a table from the FEMIS Tables list. You can double click on a table name, or highlight it and then click on the Open button. This will display a read-only window of the selected table and display it in a multi-record grid display. If the record is longer than the width of the window or there are more records available than can be shown,

scroll bars are presented to view all the records and fields. The Refresh button will requery the database and all previous sorting and filtering activites will be cleared. The Sort and Filter buttons are search and organization options for viewing the records in the table. The Close button will close the window. The control bar at the bottom of the window can be used to quickly move through large numbers of records or to view current data control properties. These properties are not editable regardless of mode.

Figure 4.3. DBGrid Control on the Data Manager Window
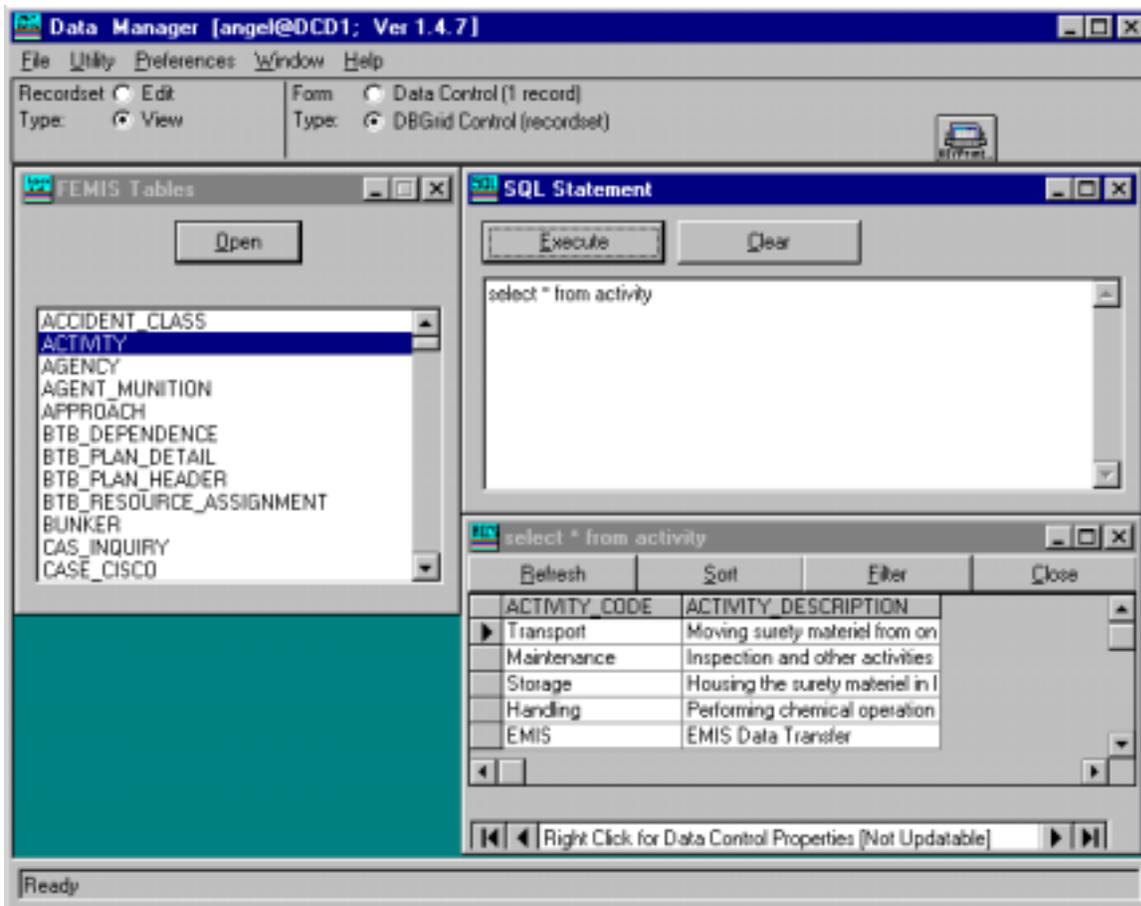
4.2.3 Other Data Manager Functions

To obtain a list of any errors you may have encountered during your session, click on Errors under the File menu. You can click on Properties to view properties of the DBEngine or Workspace and the Print entry will allow you to print the Current Screen, Current FEMIS Window, Current FEMIS Child Window or Selected Area. The Print button also provides this capability.

The Utility menu provides various options for closing windows.

The Show Performance Numbers option in the Preferences drop-down menu allows you to turn on/off the display of statistics on the opening/loading of tables. This option only applies when the Form Type: Data Control radio button is selected. It is not available when the Form Type: DBGrid Control option is selected.

4.3 Managing Relational Data

This section describes several considerations and provides some guidelines that will help you manage the relational database. Topics included are database integrity, testing modifications, managing exercise data, archiving data, and backup and recovery of the database.

4.3.1 Database Integrity

The information in the relational database has complex inter-relationships that must be maintained. FEMIS has been designed and tested to achieve this integrity.

When changes are made using the Data Manager tool or other tools, such as SQL*Plus, care must be taken to prevent inconsistencies in the database. Only System Administrators that understand the database and its inter-relationships should use these tools to make database modifications.

4.3.2 Testing Modifications

It is recommended that any significant changes to the database should first be tested by implementing them on an exercise dataset, see Section 6.0, Managing Exercise Data. If problems are encountered, the exercise data can be easily deleted without any impact on the operational data. When the changes have been tested, then they may be applied to the operational data.

4.3.3 Exercise Data

Each time a new exercise dataset is generated, approximately one-half of the tables in the relational database gain a significant number of new records. If the obsolete exercise data is not removed, database performance may be impacted. Section 6.0, Managing Exercise Data, describes the maintenance of this type of data. Each dataset should be documented and unnecessary exercises deleted.

4.3.4 Archiving Tables

The Journal table (where events are logged), meteorological tables, and other database tables grow daily as the system is used. For example, if FEMIS is operated 7 days a week for 24 hours a day with continuous meteorological feed, the MET_CONDITION table records could increase by approximately 1,000 records per day. In a month, nearly 30,000 records would accumulate, and in a year the count would be approximately 360,000. The rate of growth for the Journal table would be less than the meteorological tables, but after a year's time, it may approach 100,000 records. These numbers of records would not fill the tables or the database but would be undesirable to view in the meteorological status boards.

Data archiving has been integrated with the Folder functionality in FEMIS v1.4.7. When a Folder is closed and marked for deletion, the information in the database is exported to a file, and then the table records for that Folder are deleted. As an integral part of Folder deletion, meteorological data and Journal data are also archived.

4.3.5 Backup and Recovery of the Database

The database files should be backed up at regular intervals. One backup per day, during off-use times, should be sufficient; your System Administrator may decide that more frequent backups are desirable. In case of disk failures or other serious problems involving the database, the files can be restored from the latest backup. See the Section 13.0, Backup Strategy for FEMIS, in the ***FEMIS System Administration Guide*** for additional details on backing up the database.

4.4 Data Sharing Between EOCs

Information in the EOC databases is shared between EOCs in order to provide users with a site-wide concept of the current status of conditions. In FEMIS, this sharing is done two different ways.

4.4.1 Depot Owned Tables

The simplest sharing is done with the depot tables that only the depot can modify. Examples are the BUNKER and MET_CONDITION tables. Offpost EOCs are provided with a read only copy of this data that reflects all changes made onpost. These shared tables are as follows:

    BUNKER
    BUNIER_CONTENT
    CSEPP_ACCIDENT
    D2_MET_SELECTION
    MET_CLUSTER
    MET_CONDITION
    MET_TOWER
    WORK_PLAN
    WORK_PLAN_ACT
    WORK_PLAN_ACTIVITY

4.4.2 Site-wide Shared Tables

Another form of data sharing assembles copies of other EOC data in a site-wide view. For example, Facility table data is shared in a view named S_FACILITY that contains information from all EOCs including the local one. There are two options available for this type of data. Table 4.1 shows the tables shared with the site-wide views and indicates the default options. If additional tables are shared, a new version of FEMIS is required.

One option is to share the data conditionally based on the setting of a flag in the table. This allows changes in the local database to occur without propagation of the data until the user wants to share it (if sharing is desired). This option is not modifiable in the current release of FEMIS; if changes are desired, a new version of FEMIS would be required to account for the modifications.

The other option allows the depot to not share its data in these site-wide views. For example, the depot may not want the offpost EOCs to view its resource data. It is possible to modify this option by tailoring data sharing at the site. To do this, modify the default settings in the vuelist.tpl file in the /home/femis/database/dba directory. To remove the depot FACILITY table from the offpost S_FACILITY views, change the Restricted condition from N to Y. This modification has to be done at the time of a fresh install or a complete reinstall of FEMIS.

CAUTION

Be very careful when changing data sharing options since errors may cause FEMIS to operate incorrectly and serious errors could be introduced.

Table 4.1. Site-wide View Tables

Table Name	Conditional	Restricted
AGENCY	N	N
ALTERNATE_ACCESS	N	N
CONTROL_POINT	Y	N
D2_INPUT	Y	N
D2_ITEM_OF_INTEREST	Y	N
D2_I_CONCENTRATION	Y	N
D2_I_DOSAGE	Y	N
D2_I_MET	Y	N
D2_I_QUANTITY	Y	N
D2_I_RELEASE_NUM	Y	N
D2_O_POSINP	Y	N
DEPARTMENT	N	N
EOC_ZONE	N	N
EXERCISE_CONTROL	N	N
FACILITY	N	N
G_DEF_COMMUNITY	N	N
G_DEF_COMMUNITY_VAL	N	N
G_DEF_EMERGENCY	N	N
G_DEF_EMERGENCY_LEVELS	N	N

Table Name	Conditional	Restricted
G_DEF_HAZARD_CLASS	N	N
G_DEF_NAV_BUTTON	N	N
G_DEF_NAV_FUNCTION	N	N
G_DEF_NAV_FUNCTION_IO	N	N
G_DEF_PAD_LABELS	N	N
G_EMERGENCY	N	N
G_NAVIGATOR_ITEM	N	N
GENERIC_TEXT	Y	N
GEO_OBJECT	N	N
GEO_OBJECT_ZONE	N	N
GIS_LAYER	N	N
GIS_THEME_DATA	N	N
INTERVAL_QUANTITY	Y	N
JOURNAL	Y	N
KNOWN_POINT	N	N
KNOWN_POLYGON	Y	N
KP_CLASS_DEF	N	N
KP_SUB_CLASS_DEF	N	N
LOCAL_CONFIG	Y	N
MEMO_UNDERSTANDING	N	N
PA_DECISION_MATRIX	Y	N
PA_UNIT	N	N
PERSON_SHELTERED	N	N
PLUME	Y	N
POLYGONAL_LAYER	N	N
POSITION	N	N
POTENTIAL_ACCIDENT	Y	N
POTENTIAL_THREAT	Y	N
PRIVILEGE	Y	N
RELEASE	Y	N
REPLICATION_TEST	N	N
RESOURCE_CATEGORY	N	N
RESOURCE_DEFINITION	N	N
RESOURCE_OWNER	N	N
RESOURCE_LOCATION	N	N

Table Name	Conditional	Restricted
RESOURCE_MOU	N	N
SHELTER	N	N
SITUATION_SUMMARY	N	N
UDS_COLUMN	Y	N
UDS_ROW	Y	N
USER_DEFINED_STATUS	Y	N
USER_MODEL_CASE	Y	N
WEDGE_POLYGON	Y	N
WK_POSITION	N	N
ZONE_CLUSTER_IN_GROUP	N	N
ZONE_IN_GROUP	N	N
ZONE_RISK_GROUP	N	N

4.5 Security Provisions

FEMIS provides table access security so it is possible to limit access to individual tables. This access is controlled by the tablist.tpl template file found in the /home/femis/database/dba directory. This table has six columns and a row for each table in the database.

The first column is the tablename and the rest of the columns control access to the table.

The second column specifies if the table is only located at the onpost database. A Y value means that a table like BUNKER is only found onpost; a B means the table is found both onpost and offpost.

The next three columns control the select, update, and insert/delete privileges, respectfully. The privileges are cumulative. To only allow read, set the Select column to Y, and the other two columns to N.

The sixth column controls which administrative schema has access to the table. A B here means both the femis and oracle schema have access. An N means neither have access, while an O lets only oracle have access. An F gives only the femis schema access.