In this system, configuration data is stored in XML tables. We've provided a simple editor to allow access to view and modify the data. The editor does not allow modification of the database schema.

A database is a set of flat files organized as rows and columns. A collection of related files are contained in a database. The database is organized in XML documents. There are two kinds of XML documents: a database description and the data tables. The description file contains a description of the data tables: the table name and columns for each table. The format is

<DATABASE name='databasename'>

<TABLE name='tablename'>

<COLUMN name='columnname' type='columntype'/>

...

</TABLE>

...

</DATABASE>

A data table is named "databasename\_\_tablename.xml". For example, if the database description is in 'TEST\_DB.XML', the <DATABASE> tag inside that document should have as its name attribute 'TEST\_DB'. If that file has a <TABLE> tag with an attribute 'BIG\_TABLE', there should be a file 'TEST\_DB\_\_BIG\_TABLE.XML' that contains the data for the BIG\_TABLE database table. This file must be in the same directory as the database file.

The format of a data table XML file is

<DATABASE name='databasename'>

<TABLE name='tablename'>

<ROW>

<columnname> value </columnname>

...

</ROW>

...

</TABLE>

</DATABASE>

Any xml file in the database can have a history section, usually at the bottom of the file. The history section is

<HISTORY>

<ITEM date='mm/dd/yyyy' author='authorname' comment='note' />

</HISTORY>

When started, the editor opens a database edit window. This window displays the tables in a database. Initially, no database is loaded. There is a menu with File and Search. File has the options to open, close, and print tables. A user can open either a database description file or a data file. If a data file is opened, the corresponding database description is also opened. The database description window displays all the database tables. Selecting a table from this display opens the data table display in a new window. It is possible to open more than one database at a time. Opening a database table file results in the database description also being opened. It is possible to open more than one database at a time. All the windows associated with a specific database have the same color outline. Opening an already-opened table should result in the table editor window for that table being raised to the top of the screen and being visible.

The *Options/History* option displays the history data section. On file save, the user is prompted to enter a new history entry.

If the file has been modified and the user attempts to close the file, a save prompt should be displayed.

Search opens a file search dialog that allows a user to search specified directories for files that contain a given text string. When using this option, files containing the text string are listed. Selecting the file from the display will open the database table.

In the data table display, data is displayed and is editable. The menu has *File, Edit, Options*, and *Help*. The *Help* option describes the editor features. The *Edit* menu option allows the user to insert, delete, copy, paste, and undo. The create and delete options are row operations: entire rows are affected. *Undo* is any operation that affects the data. It is also possible to modify rows from the table. It is not allowed to change the column headers. It is possible to re-order columns by dragging them to a new location. Duplicate rows are highlighted in yellow. Fields violating field constraints specified in the database description file are highlighted in red.

In data table display, the column names are displayed across the top row. Just below this is a blank row. This row is the display filter row. Entering data in this row will result in only the matching data rows to be displayed. In the File menu, there are options for *OR FILTER* or *AND FILTER*. If *AND FILTER* is selected, the display is restricted to rows that match all of the filters entered. If the *OR FILTER* is selected, the display should contain rows that match any of the filters entered. The filters allow a limited type of regular expression matching described on the Help pages.

The *File/Compare* option allows a user to compare two versions of a table. This compare can be restricted to selected columns by using the *Options/Column Selection* feature. The output is rather crude and is not intended for large change lists.

*File/Check for Duplicate Rows* should list rows that have identical contents. This check is restricted to the columns selected in *Options/Select Columns.*

Constraints

A constraint on a column is specified in the database table description inside the column description. For example:

<COLUMN name='FIELD\_DP' type='DOUBLE\_PRECISION' >

<CONSTRAINT name='NN\_0' type='NotNull'/>

</COLUMN>

The constraint name must be unique in the table. Types of constraints are

NotNull

Unique

Check

For *NotNull*, the entry in the data table must have some value. For *Unique*, the value must not be duplicated anywhere else in the table (e.g., the table's key value). For *Check*, the value must match one of the OPTION fields. For example:

<CONSTRAINT name='EN\_1' type='Check'>

<OPTION>OPT01</OPTION>

<OPTION>OPT02</OPTION>

</CONSTRAINT>

Constraint violations are highlighted in red in the data table display, and hovering the mouse cursor over the highlighted column should display a message describing the violation. Multiple constraints are allowed for each column.