

### **4.3.3 ClearCase Baseline Manager (BLM)**

ClearCase BLM is a custom application specifically designed to serve as an efficient configuration management tool to manage the ECS Baseline. It generates and maintains records that describe what comprises baselined operational system configurations for the DAACs, SMC, VATC, PVC, and the Landover EDF2 string. These records identify baselined versions of hardware and software items as well as their assembly structures and interdependencies. ClearCase BLM keeps chronological histories of baseline changes and traceability of items to predecessor versions and system releases. In addition, the tool provides visibility to CCR approved baseline changes, as well as references to associated Release Notes documents.

ClearCase BLM does this by maintaining a set of ClearCase version-controlled elements along with scripts and internal information about how they relate. Control item records represent physical resources such as COTS software and host names assembled to form operational systems, as well as logical artifacts such as baselines and other configuration items. They are designated to relate system entities directly to discrete responsibilities and actions associated with configuration management of the system. ClearCase BLM's catalog of control items is called the /ecs/cm/CIDs directory record set. The ClearCase BLM tool is an enhanced ClearCase GUI that uses the power of the ClearCase code management system to manage the GUI scripts, records, and scripts used to manage the baseline. Baseline records can only be affected with approved CCRs.

The most significant relationship maintained among control items is product structure. Product structure is the term for the ClearCase BLM data constructs that define the ingredients – or bill of material -- for a site. Product structures have corresponding CCR approval dates that establish the baseline change effectivity dates, and they reference CCRs numbers, as well as Release Notes.

ClearCase BLM is installed only at Raytheon Landover, MD, where it used by CM personnel to manage baseline data about resources deployed to all external ECS sites, including the DAACs and the SMC, as well as the three internal ECS sites, the PVC, VATC, and the EDF2 string (Evolution). The EMD Baseline Information System (EBIS), is visible externally through the URL <http://cmdm.east.hitc.com/baseline/>, and internally, at <http://pete.hitc.com/baseline/>. Also, each site has an EBIS that is served locally. These EBIS sites are served from m0mss04, e0ins01, g0ins01, l0ins01, and n0ins02. Each site manages access to their own EBIS file system. In the course of baseline updates, the data is replicated from “pete” to the other 6 EBIS servers. Each site offers a consolidated view of baseline data system-wide, as well as site-specific views. ClearCase BLM generates specific baseline reports that can be viewed, printed, or saved in a file. These reports are automatically formulated, posted to “pete”, and then replicated to the external servers.

#### **4.3.3.1 Internal ClearCase BLM Data Constructs**

The ECS baseline data for COTS S/W, COTS S/W patches, Operating Systems, O/S patches, data files, databases, ECS hosts and host functions, resides in ClearCase as “text\_file” elements.

A default configuration specification is used to view the information, using the CM\_MASTER view tag name.

A variety of files and methods hold this information, which are explained in detail below. Note that the architecture of the data design portion of ClearCase BLM minimizes the number of steps to update the baseline, by either implementing new CCRs or correcting previously entered CCR data.

There are 10 data constructs described below. One or more constructs is referenced by scripts in order to generate the specific Baseline Reports.

#### **4.3.3.1.1 Control Item Identifiers**

This describes the Control Item Identifiers (CIDs) for the ECS COTS S/W. The ClearCase directory that holds all of the CIDs is /ecs/cm/CIDs/. Within this directory are ClearCase text\_file elements. Text\_file elements are used because they can be directly edited, and they require the least amount space for storage.

Each CID is a Comma Separated Variable (CSV) formatted file, which means that each of the fields used a comma (,) as a delimiter. This format was chosen since the files can be readily exported/imported with Microsoft Windows products, such as Excel. The record format for each CID is contained on one line, and consists of 16 items, described below:

- 1) ECS NAME - This is the name of the ECS COTS S/W, using a familiar nomenclature. The ECS NAME may contain 30 characters or less, with no embedded commas. Other restricted characters are: !, @, #, \$, %, ^, &, \*, ~, ` , ?. These characters have special meaning in the UNIX Operating System.
- 2) COMMODITY CODE – A character used to convey the procurement nature of the COTS product. This field is 1 character, and can be a “P” to mean Purchased, and “F” to mean Freeware, an “S” to mean Shareware, or a “-“ to mean “unknown”. These four characters are the only characters known to the algorithms that reference this field.
- 3) RESP ORG – This is the Responsible Organization, or the group which has the most knowledge regarding the use and placement of the product. A maximum of 6 characters may be used to represent the RESP ORG item within each CID record. A “-“ indicates that the RESP ORG is unknown.
- 4) VARIANT – This item may use at most 10 characters, and is the host O/S that would have this COTS S/W installed. Current variants are “Solaris”, “IRIX”, “Linux”, “Windows”, and “AIX”.
- 5) MFR/DEV NAME – This is the manufacturer or developer of the COTS S/W. A maximum of 30 characters can be used to represent the name of the manufacturer or developer. A “-“ indicates that the MFR/DEV NAME is unknown.
- 6) VERSION – This is the version of the COTS S/W. Specifically, the version nomenclature used by ClearCase BLM is the manufacturer nomenclature. The manufacturer nomenclature may contain “minor” version information that may not be known, but must be represented in the baseline data for accurate tracking and

- identification. A “-“ indicates that the VERSION is not known. A maximum of 21 characters can be used to represent the VERSION.
- 7) PRINCIPAL DIRECTORY – A maximum of 50 characters conveys the installation location. Nearly all COTS S/W resides in multiple sub directories. To keep the installation location reasonable, the highest sub directory is represented. All of the COTS S/W must reside at the PRINCIPAL DIRECTORY or lower. A “-“ indicates that the PRINCIPAL DIRECTORY is unknown.
  - 8) CONTROL ITEM ID – A Control Item Identifier is a 9 character string which uniquely identifies a record with the /ecs/cm/CIDs ClearCase BLM directory. The first character is always a “B”, and is always followed by an 8 character integer. The storage of this value in the record, which is also the file name within the /ecs/cm/CIDs directory, provided redundancy.
  - 9) COMMENT – In order to provide clarification, a maximum of 60 characters may be used. Commas may not be used, as well as the character set described in the ECS NAME field in 1).
  - 10) CRITICAL ITY – Each COTS S/W is either Critical or Not Critical. A Critical COTS S/W product is required in order that the custom software may operate on the installed host. The CRITICALITY is either “YES”, “NO”, or “-“ for unknown. This field must be equal to or less than 3 characters in length.
  - 11) ITEM SUBCLASS – A maximum of 7 characters may represent the item subclass. Typical subclasses are “program” or “OS”, and describe a major category in which the COTS S/W belongs. Nearly all CIDs are either “program” or “OS” (Operating System). A “-“ indicates that the ITEM SUBCLASS is unknown.
  - 12) REF CODE – A REF CODE may be at most 1 character, and is a Reference Code. A “-“ indicates that the Reference Code is unknown.
  - 13) CSCI – Computer Software Component Identification – A CIDs CSCI may be at most 5 characters. A “-“ indicates that the CSCI is unknown.
  - 14) RELEASE NOTES – Usually, but not always, a COTS S/W product uses a Software Release Notes document to provide installation instruction, installation hosts, and a variety of other pieces of information. The format of this record may use a maximum of 16 characters. A typical Release Notes field looks like “914-TDA-223”. A “914-TDA-xxx” is used if the Release Notes is not known.
  - 15) CCR – Configuration Change Request. As any baseline change requires a CCR, it is useful to contain this number in the CID record. A CCR may contain up to 7 characters, but usually 6 characters are sufficient. A CCR looks like “03-0205”. Rev 1 to CCR “03-0205” would be “03-0205A”. Change records for which no CCR could be found are “03-0010E”. The suffix “E” indicates that the CID is real, however a relating CCR could not be obtained from and Configuration Management records.
  - 16) EFFECTIVITY DATE – For the ClearCase BLM tool, the effectivity date is the CCR approval date. This date signals that the change request is approved. The EFFECTIVITY DATE max contain a maximum of 8 characters, and is of the format mm/dd/yy, e.g., “03/28/03”.

All ClearCase BLM CIDs originated from XRP-II BLM CIDs. The CID format originated from XRP-II. In order to check the XRP-II data export into ClearCase BLM, the CID nomenclature was kept identical.

#### 4.3.3.1.2 Current Hosts List

The Current Hosts list contains all of the ECS baseline hosts. The ClearCase path is “/ecs/cm/host\_data/current\_hosts”. The UNIX file date for this file is the timestamp to indicate when the file was last changed.

There are as many lines to the file as there are current hosts. There are four fields within each record. Column 1 is the ECS host name. Column 2 is the ECS sub system to which the ECS host belongs. Column 3 is the CSCI for the ECS host, and column 4 is the ECS host major function.

- 1) ECS Host Name – This is the string returned from “uname -n” while logged onto the ECS host. Host name formats are 7 letters, generally. The first letter connotes the ECS site, “e” for EDC, or LP DAAC, “g” for GSFC, “l” for LaRC, “n” for NSIDC, “m” for SMC, “p” for PVC, and “t” or VATC.
- 2) ECS Host Subsystem – This is the ECS functional component. The sub system name is three letters followed by the word “Subsystem”. The second column is always exactly 13 characters long, e.g “AST Subsystem”.
- 3) CSCI – A specific set of up to 5 characters which identify the Computer Software Component Identification.
- 4) ECS Host Major Function – Each ECS host exists for a purpose. The purpose is stated in column 4 of this construct, and may contain a maximum of 30 characters.

#### 4.3.3.1.3 Data List

In order to emulate the earlier XRP-II reports, this construct was created. There are two entities that are present in the reports, “data” and “databases”. The Data List construct exists to provide the “data”. This construct path is /ecs/cm/BLM/host\_data/data, and is a Clearcase text\_file element that is directly editable. It is a CSV formatted file.

Each record (line) within this file is comprised of 7 fields:

- 1) ECS Host Name – This is the name of the hosts, e.g., “e0ais03”. The name can be a maximum of 10 characters.
- 2) Data Name – This is the data that is conveyed by the Construct. A typical data name is “Production data”, or “Ingest files”. The Data Name can have a maximum of 50 characters.
- 3) Data Version – This is the version of the Data Name. This can be at most 7 characters, and represents the major version of the data, such as “6A”.
- 4) Data Construct Type – For this construct, the fourth field must always say “data”.
- 5) Data CID – Data Control Item Identifier. This field has a CID format entry, and has to be exactly 9 characters in length.
- 6) Data CSCI – Computer Software Component Identification – A CSCI may be at most 5 characters.

- 7) Data Responsible Organization – The cognizant ECS organization for the data; the owner of the data. This field may be a maximum of 6 characters.

#### 4.3.3.1.4 Databases List

In order to emulate the XRP-II reports, this construct was created. There are two entities that are present in the reports, “data” and “databases”. The Databases List construct exists to provide the “databases”. This construct path is /ecs/cm/BLM/host\_data/databases, and is a Clearcase text\_file element that is directly editable. It is a CSV formatted file.

Each record (line) within this file is comprised of 8 fields:

- 1) ECS Host Name – This is the name of the hosts, e.g., “e0ais03”. The ECS Host Name name can be a maximum of 10 characters.
- 2) Database Name – This is the data that is conveyed by the Construct. Database name examples are “Autosys DB”, or “DDTS db”. The Database Name can have a maximum of 50 characters.
- 3) Database Version – This is the version of the Database Name. This can be at most 7 characters, and represents the major version of the database, such as “6A”.
- 4) Database Construct Type – For this construct, the fourth field must always say “database”.
- 5) Database CID – Database Control Item Identifier. This field has a CID format entry, and has to be exactly 9 characters in length.
- 6) Database Code – A single character, either blank, or the letter “I”.
- 7) Data CSCI – Computer Software Component Identification – A CSCI may be at most 5 characters.
- 8) Data Responsible Organization – The cognizant ECS organization for the database; the owner of the database. This field may be a maximum of 6 characters.

#### 4.3.3.1.5 Hosts’ Functions List

In order to emulate the earlier XRP-II reports, this list was created. In the ClearCase BLM 920-TDx-002 Hardware/Software Map reports, there may be a few lines, just after the host name, that describe more host attributes, or functions, such as ” FLEXIm License Server”, or “NIS Master Server”. This construct path is /ecs/cm/BLM/host\_data/host\_functions, and is a Clearcase text\_file element that is directly editable. Each record consists of two column groupings.

Each record (line) within this file is comprised of the following:

- 1) ECS Host Name – This is the name of the host, e.g., “e0ais03”. The ECS host name can be a maximum of 10 characters. The ECS host name must begin in column 1.
- 2) Host Function – This is a text string with a maximum of 50 characters. This descriptive text provides information regarding host functionality. The Host Function text must begin in column 14, in order for the data to align correctly in the reports. Embedded commas are permitted in this construct.

Note that the spacing of the host name and the text appears in the record lines exactly in the output 920-TDx-002 reports. No reformatting of the data is performed in the generation of the reports.

#### 4.3.3.1.6 Control Item Identifier Type List

In order to emulate the original 910-TDA-003 report, another piece of information is required. This is the category to which the CID belongs. Examples of these CID functional groupings are: Compilers, Editing & Viewing, Operating Systems, and the like.

Each record of this file consists of two column groupings:

- 1) Functional Group Name – The first character of the string must be placed in column 1. The string length may be up to 38 characters.
- 2) CID – Control Item Identifier number. This number must exist with the /ecs/cm/CIDs directory, described above as Data Construct 1. The 9 character CID must begin in column 39.

#### 4.3.3.1.7 Operating System Patch Sets

Patch\_sets are described in this section. These are sets of information, residing in the directory /ecs/cm/BLM/patch\_sets/. There are about 20 patch sets that are named according to their function. A patch set name may be up to 30 characters in length. An example Patch Nomenclature name is “IRIX\_core”. Each line within a patch set (record) is comprised of 6 column groupings, and are described below:

- 1) Patch Nomenclature – This is a name of the patch set. The string must start in column 4, and may use up to column 27, for a total maximum character length of 24 characters.
- 2) Patch Description – A comment-like character string that adds information value and detail to the Patch Nomenclature. This data must start in column 29 and be complete by column 83 (or a maximum string length of 55 characters).
- 3) Patch reference – With each patch release, there is a related Release Notes Technical Document, e.g., 914-TDA-087, or a related Patch Technical Document, such as 911-TDA-011. This field begins in column 85 and is 16 characters in length (to column 101).
- 4) CCR – This is the CCR number which authorized its placement in the ECS baseline. Columns 107 through 114 house the CCR number.
- 5) Release Notes tech doc - With each patch release, there is a related Release Notes Technical Document, e.g., 914-TDA-087. This field begins in column 118 and is 16 characters in length (to column 133).
- 6) ECS Subsystem – Up to three characters long, this field relates the patch information to the cognizant sub system, such as “IDG”.

Note that the column positions are critical; the generated 920-TDx-014 Patch Maps take these records and directly import them into the records with no reformatting.

#### 4.3.3.1.8 Configuration Change Request (CCR) Data

The ClearCase BLM Tool relates all change requests to the items changed, including an effectivity date. This date is the effective date for which the change pertains. CCR information is stored in Data Construct 8. This construct exists as directory /ecs/cm/CM. Under this directory are sub directories, one for each year for the CCRs. For the year 2003, the sub

directory name is 2003\_CCRs. So any 2003 year CCRs are found in the path:  
/ecs/cm/CM/2003\_CCRs/.

For each CCR, another sub directory exists, which consists of the last four digits of the CCR, or five digits if the CCR has been revised, like “0188A”. The first two digits of the CCR represent the year. So for the example of the CCR 03-0188A, a directory /ecs/cm/CM/2003\_CCRs/0188A/ exists. Data Construct 8 is probably the most important of all the Data Constructs, as it provides the relations of the CIDs to the ECS hosts. For each CCR sub directory, there are the following sun constructs:

- 1) “CID\_map” file – This file, always named “CID\_map”, provides the relations of the Machine Impacted file(s) (MI) to the CIDs. It always has at least one line, but may contain more than one line, as a single CCR may relate more than one CID to a host set (MI) file. It has two columns. The first column is the name of an “MI” file, up to 20 characters in length.
- 2) “MI” file(s) – This is an abbreviation for the “Machines Impacted” file. The source of this information is derived from the CCR’s Release Notes document (914-TDA-xxx). Within the Release Notes document is a section that describes *which hosts* should receive *what COTS S/W*. Most CCRs have a CID\_map file with only one MI and CID. The next most common arrangement is to have two variants, and SGI and a Sun variant. In this case there are two lines in the CID\_map file. One line, MI\_Sun, maps to the Sun variant of the CID. The other line maps the MI\_SGIs to the SGI CID for the CCR.
- 3) CCR pdf file – This file is the Portable Data Format (Adobe) CCR.

#### 4.3.3.1.9 ClearCase BLM Sequencer

A single file, “/ecs/cm/BLM/scripts/Sequencer”, controls which CCRs, and in what order, are applied to the baseline. This editable yet executable file provides the mechanism for relating the application of CCRs, their MI files and CID\_maps, to populate what is known as the “dartboard” area. The first record in this file applies the first CCR to a “null”, or empty baseline. The last record applies the last CCR to the “dartboard”. The format of each record of this file is:

- 1) Function Call – This is always the same string, “/ecs/cm/BLM/scripts/Implement\_CCR”. This function applies the first argument of the call, which is the CCR, to the “dartboard”.
- 2) CCR – Configuration Change Request. A number that identifies a change to a baseline. It authorizes the application of a COTS S/W product to an ECS host or set of ECS hosts.
- 3) Comment 1 – This comment is the “function”, or COTS S/W name, of the CCR.
- 4) Comment 2 – The CCR approval date (Effectivity Date)
- 5) Comment 3 – This is the Release Notes Tech Doc number, which is referred in the CCR.

#### 4.3.3.1.10 ClearCase BLM Dartboard

The ClearCase Derived Objects, located within the “/ecs/formal/BLM/dartboard” directory, comprise the Dartboard. This directory contains one file representing the collective assembly of

all applicable COTS S/W products as authorized by approved CCRs for each ECS host. COTS S/W application is performed by using file concatenation. The first CCRs (earliest) show up first in these dartboard files. The last applied CCR shows up as the last record in these files.

Each dartboard file name is an ECS host, like “e0ais03”.

The format of each line in a host dartboard file is as follows:

- 1) ECS host name – This is the ECS host name.
- 2) Authorizing CCR – This is the CCR from the Sequencer file.
- 3) BLM Tool user – This is an authorized User of the ClearCase BLM tool.
- 4) Timestamp – This is the time at which the CCR was applied to the file in the dartboard.
- 5) CID Echo – This is the entire contents of the CID record, as specified by the CCR’s CID\_map, MI files, and CID reference.

Note that Data Construct 10 is a ClearCase derived object, and is not “checked-in” like the first Data Constructs. The dartboard directory, in conjunction with the “/ecs/cm/BLM/host\_data/current\_hosts” file, is used to populate the 920-TDx-002 Hardware Software Map Technical Documents.

#### **4.3.3.2 ClearCase BLM Graphical User Interface (GUI)**

The ClearCase BLM tool makes use of an OSF Motif graphical user interface. This provides convenient drop down menus, and provides a convenient method for dynamically formulating the contents of the drop down menus.

##### **4.3.3.2.1 ClearCase BLM “NEW CCR” GUI Drop Down Menu**

Use the “New\_CCR” ClearCase BLM Tool GUI to enter data associated with newly approved CCRs. The amount of GUI traversal and data input has been optimized to minimize the time needed to process approved CCRs. Refer to Figure 4.3.3-1 to view the New CCR drop down menu.

The first thing to do is to enter the new CCR number. A quick check is made to ensure that the CCR number is indeed a new CCR number, one that does not exist in the database. Extensive syntax checking is performed to ensure that the entered CCR number is of the correct format and has the hyphen character. See Figures 4.3.3-2 through 4.3.3-9 for the new CCR entry user interface and subsequent screens.

The next set of steps taken depends on the nature of the CCR. A COTS S/W CCR will only affect the 920-TDx-002 Maps for instance, while O/S patch changes will affect the 920-TDx-014 reports.

For COTS S/W changes, a new CID usually needs to be created. Use the “Construct new CID” menu item in the “New\_CCR” main menu bar to construct the new CID. Script has been written to easily perform this task. Usually an existing CID can be copied, and only minor adjustments made, such as the CCR approval date or Release Notes document number, and usually the COTS

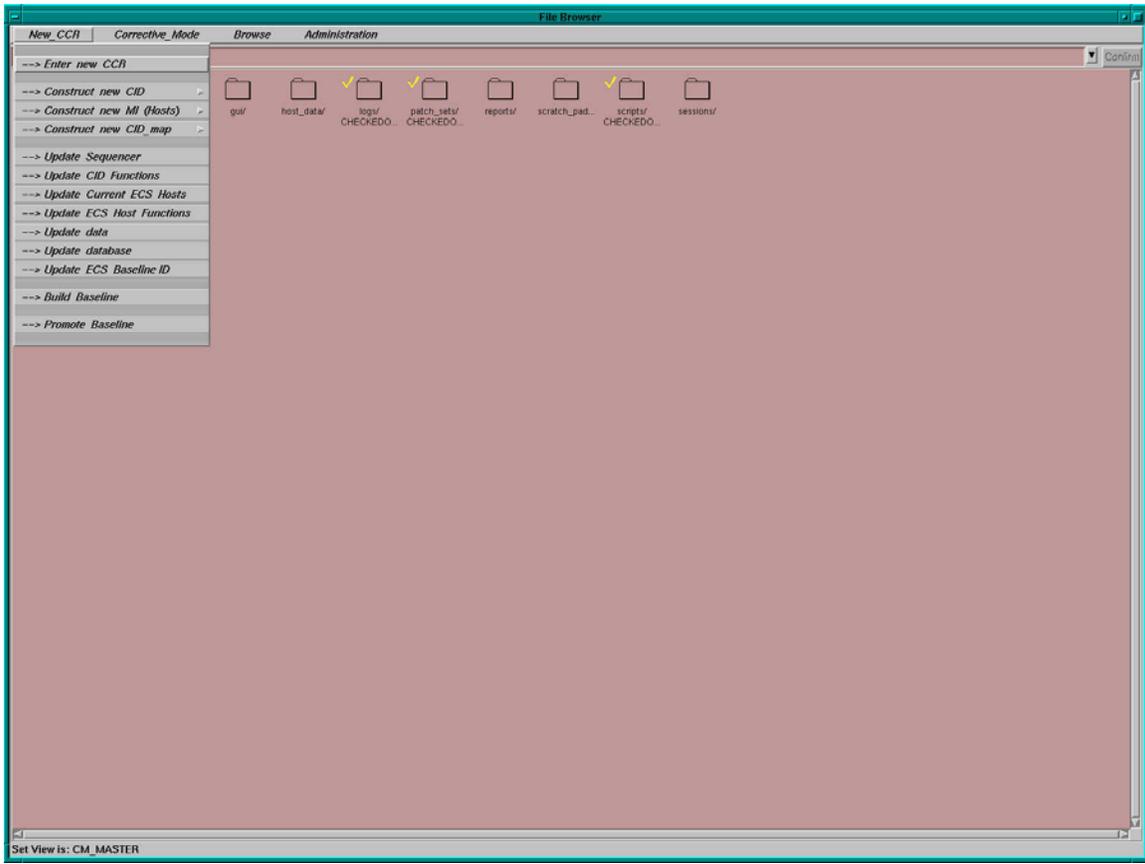
S/W version number. This CID is then “committed” to the database (/ecs/cm/CIDs), and is later referenced in the CID\_map file for the new CCR.

Also, a Machines Impacted (MI) will need to be created. This MI file and the new CID will be associated in the CID\_map file. Depending on the CCR, more than one MI file linking with another new CID may be required. Perform these steps as needed, then commit the CCR as the last step. Committing the CCR will checkin the CID\_map file, any new MI files, and finally the CCR itself.

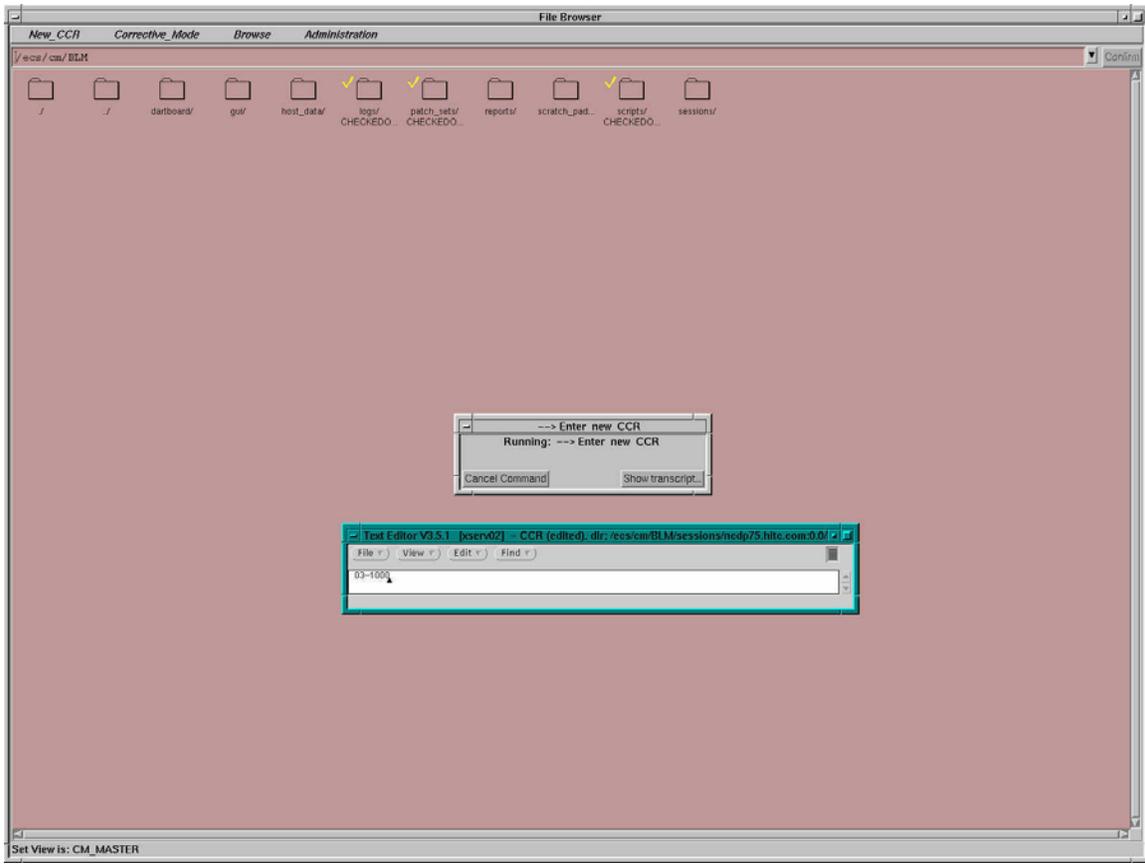
The Sequencer is then updated. Usually the CCR is added to the end of the Sequencer. Sometimes, earlier entries or CCR constructs may need to be edited, so that more than one version of a COTS product will not appear in the 920-TDx-002 reports.

Other more infrequently used data may need to be altered, and this just depends on the nature of the CCR. To remove an ECS host for example, select the “Update Current ECS Hosts” menu line item, and delete the ECS host. If a new CID is added to the database, its function must also be added using the “Update CID Functions” line item.

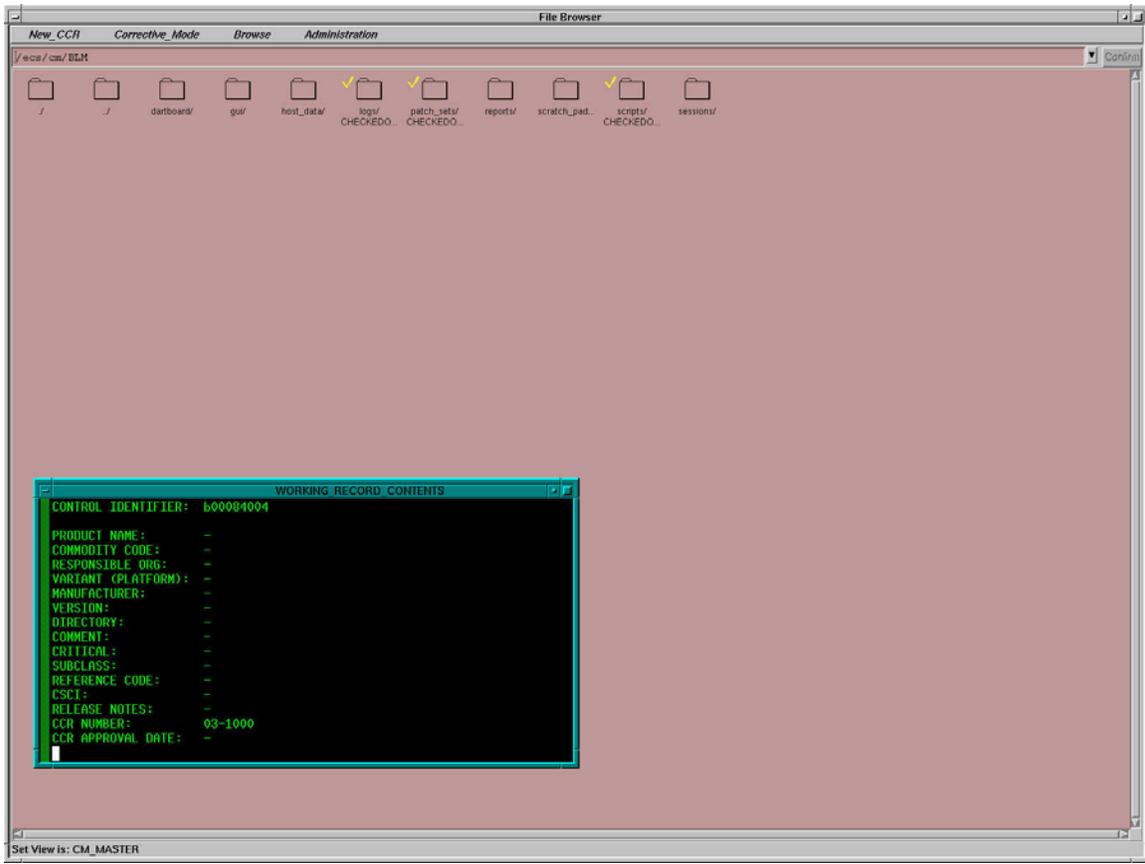
Selecting the “Build Baseline” line item will generate all of the ClearCase BLM reports, and selecting the “Promote Baseline” line item will place all of the reports in the proper directories on “pete” and “cmdm”. These two functions save hours of labor and ensure a consistent product.



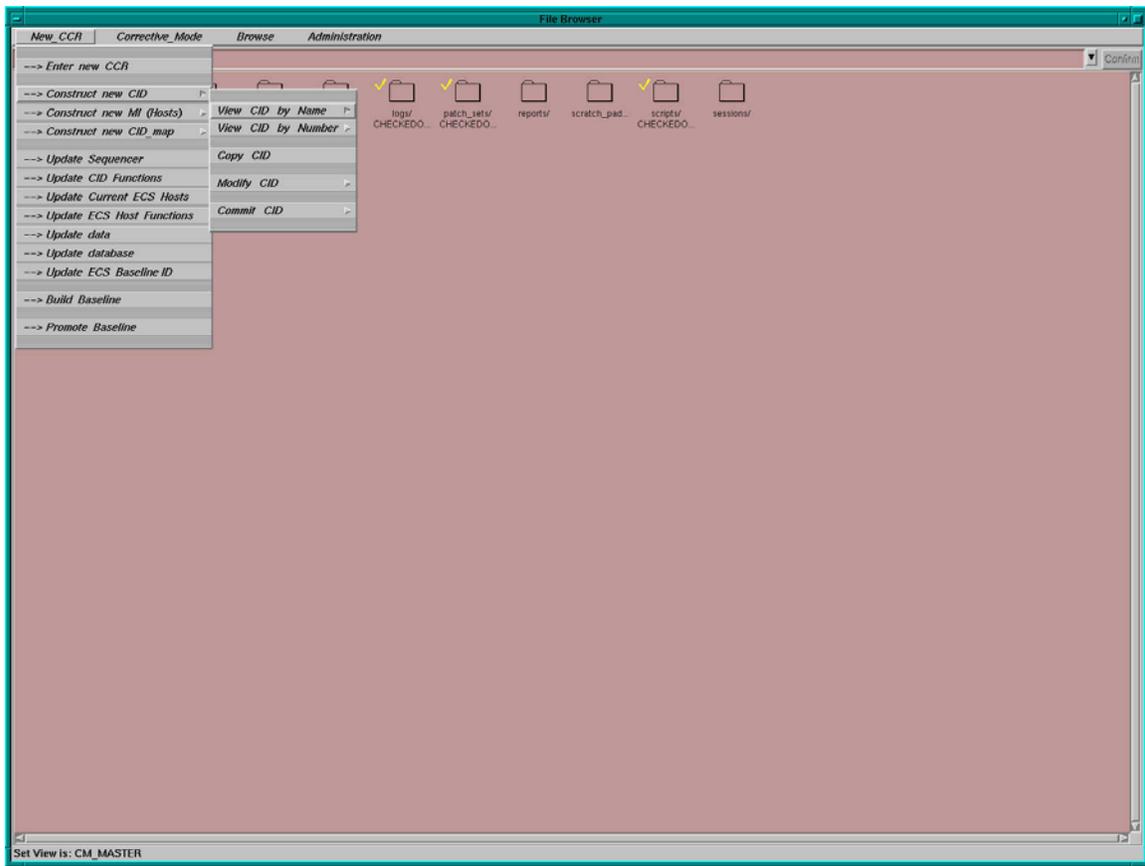
**Figure 4.3.3-1. New CCR Drop Down Menu**



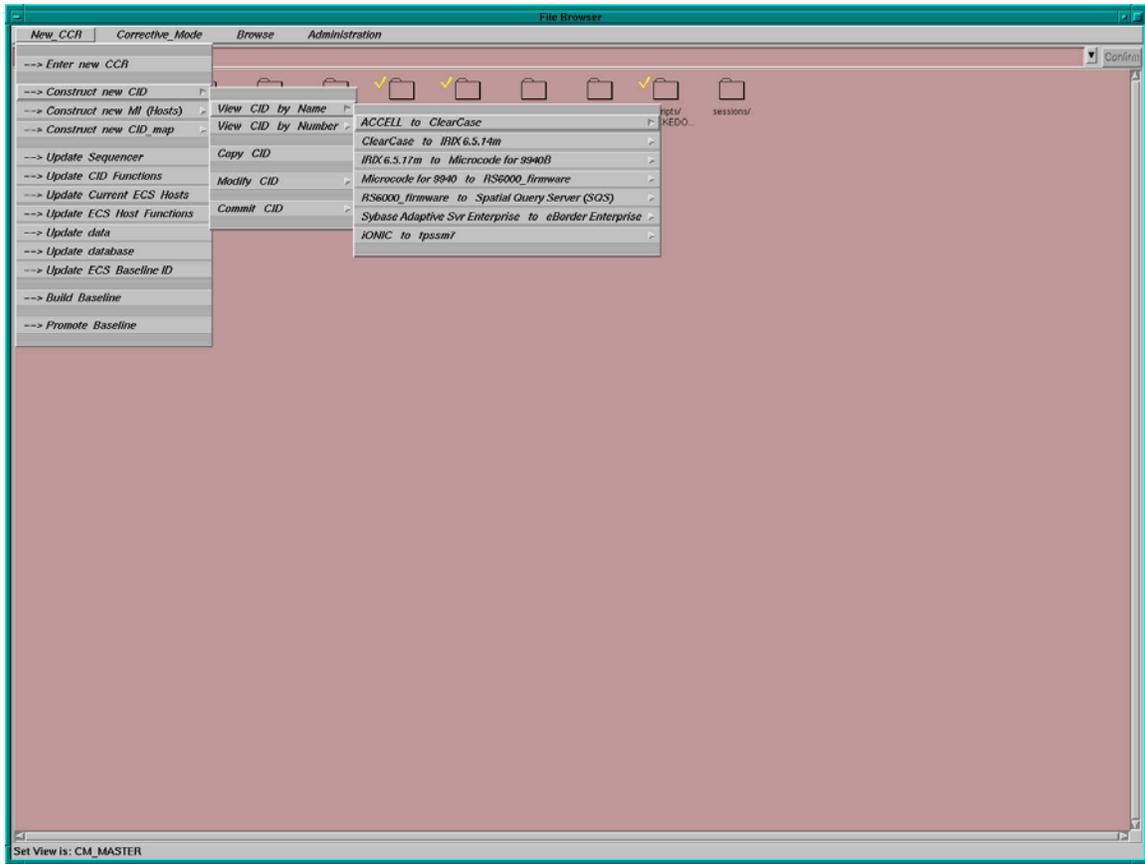
**Figure 4.3.3-2. Entering a New CCR Number**



**Figure 4.3.3-3. Working Record Contents for a New CCR**



**Figure 4.3.3-4. New CCR Drop Down with Construct New CID Selected**



**Figure 4.3.3-5. View CIDs by Name Drop Down Sequence**

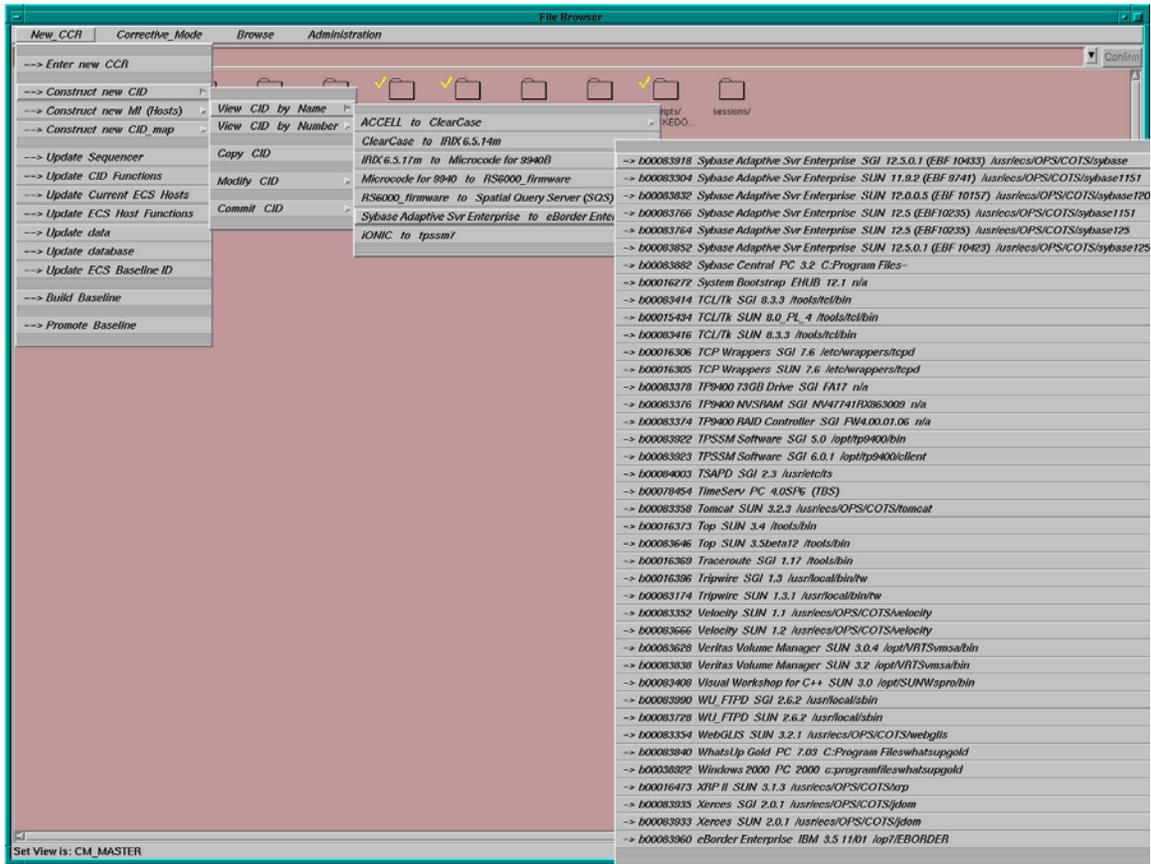
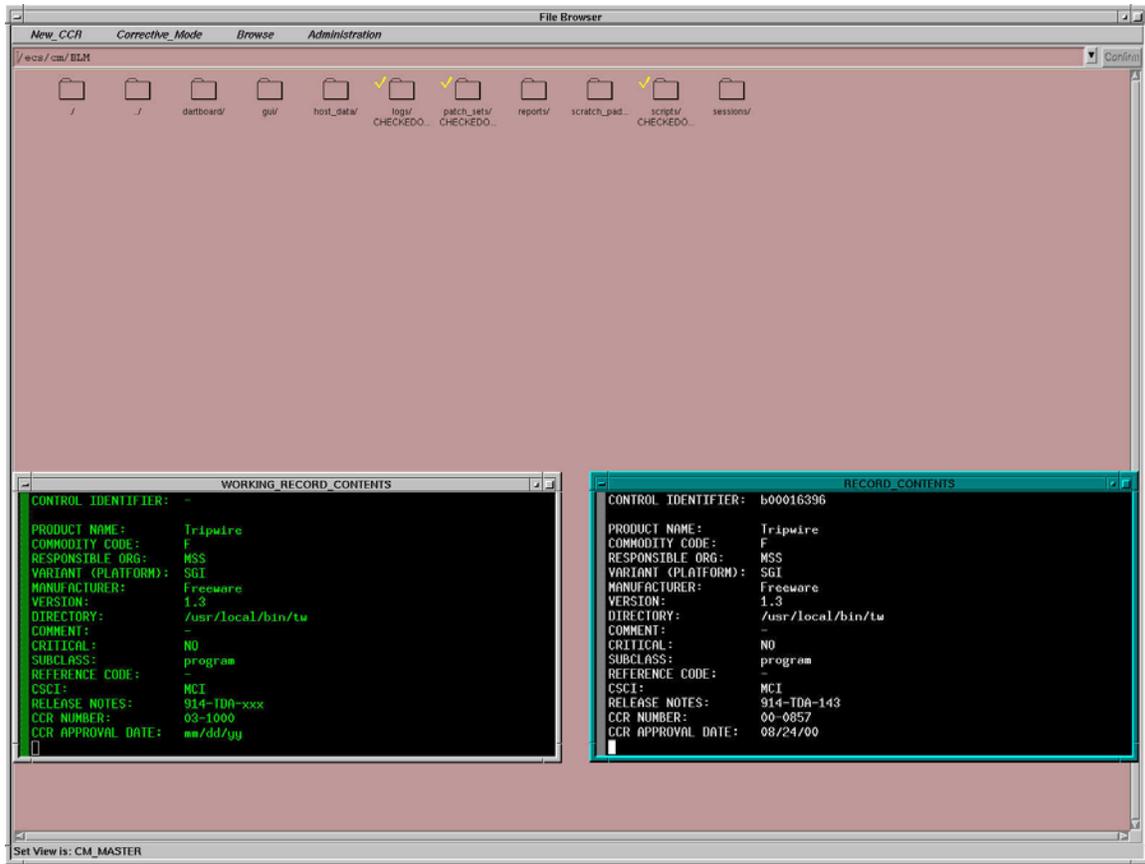
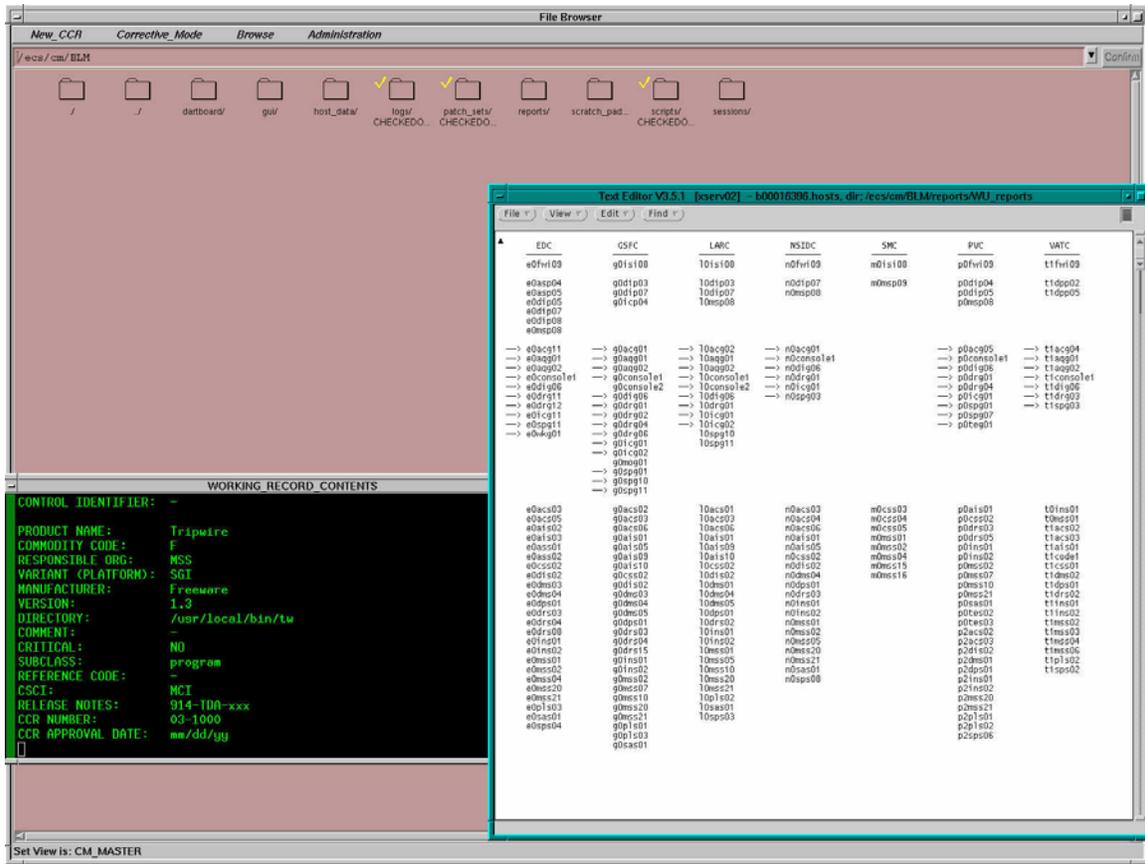


Figure 4.3.3-6. COTS Software Selection Drop Down





**Figure 4.3.3-8. Working Record Contents Up**

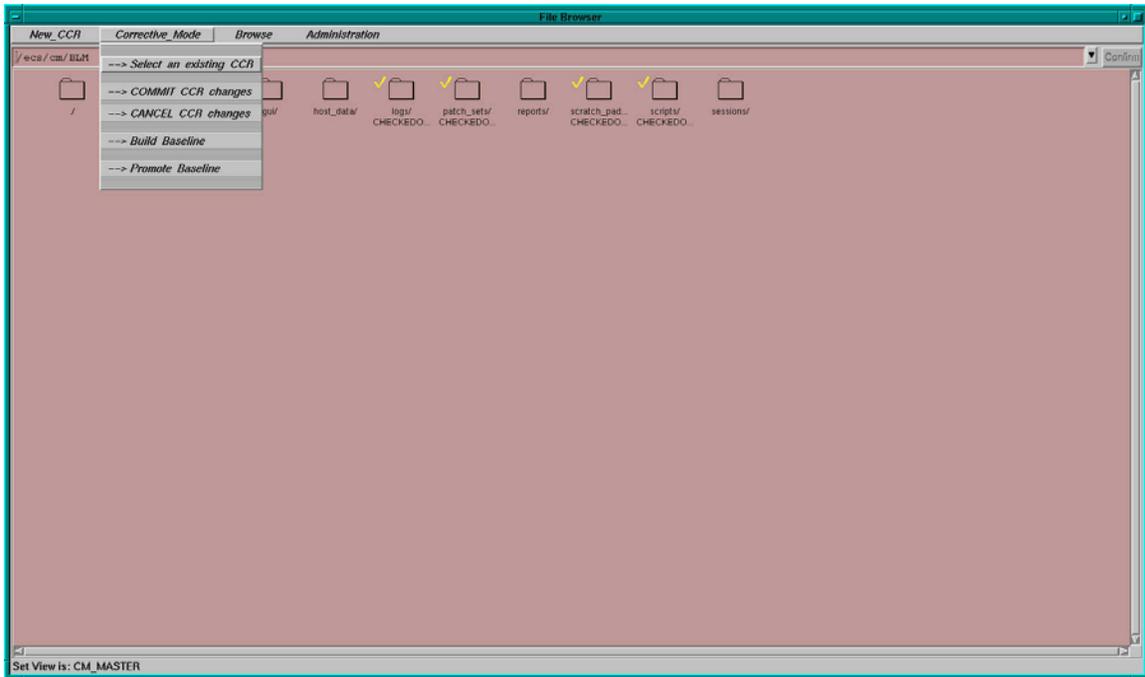


**Figure 4.3.3-9. All ECS Tripwire SGI Hosts**

#### 4.3.3.2.2 ClearCase BLM “CORRECTIVE MODE” GUI Drop Down Menu

This ClearCase BLM Tool mode is used for correcting information that has already been entered for an approved CCR. The basic steps are:

- 1) Select an existing CCR number
- 2) Alter the data
- 3) Either COMMIT the changes, or CANCEL the changes
- 4) Build the baseline, incorporating the changed data, if COMMITted
- 5) Promote the baseline, after ensuring that the changes were made as intended



**Figure 4.3.3-10. Corrective Mode Drop Down Menu**

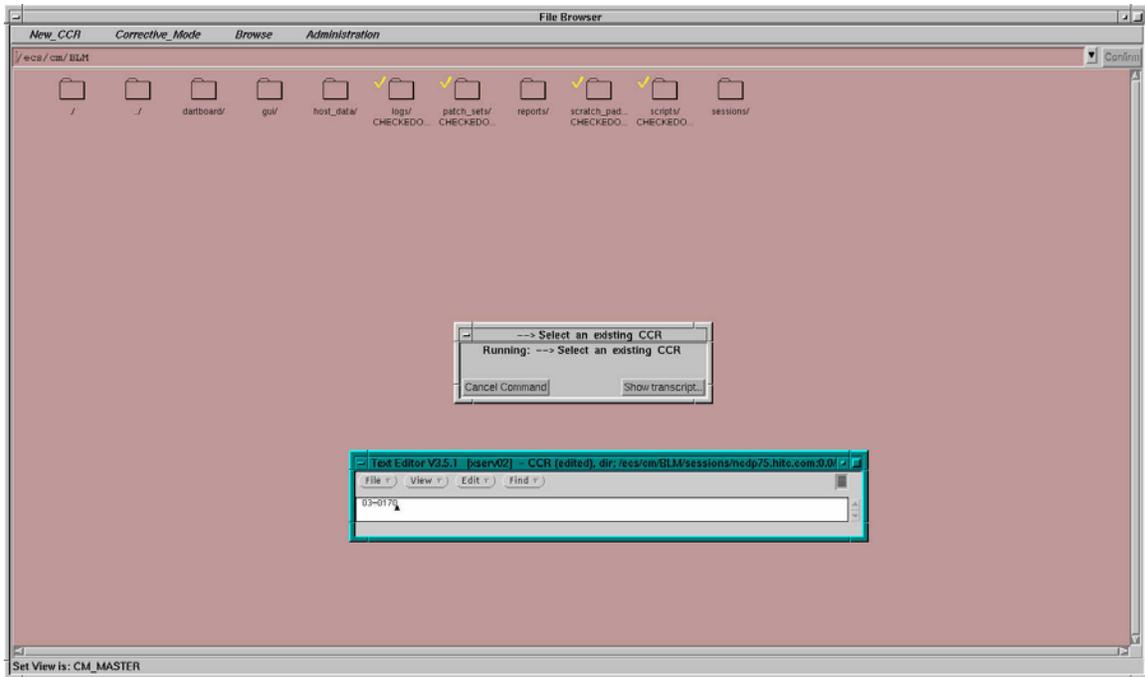
An error will be returned if the CCR does not exist in the ClearCase data structures.

The design intention of this mode was to allow corrections to data that had already been entered. In order to get the ECS baseline data corrected, it was necessary to allow controlled editing of historical files, including the CID\_map, any Machines Impacted (MI) files, and any associated Control Item Identifier (CID) records.

Each approved CCR has only one CID\_map. This correlates the MI files to the CID. Typically, but not always, there are two variants (host types, like SGI and Sun) of COTS S/W which must be accounted. The CID\_map would then have two lines, one MI file for SGI hosts (MI\_SGI), and one MI file for Sun hosts (MI\_Sun). There would also be two CIDs to account for the SGI and Sun variants. The CID\_map would then relate the MI\_SGI hosts to the SGI variant CID, and the MI\_Sun hosts to the Sun variant CID.

Too often the original MI lists are wrong, that is, the hosts which were directed to get the COTS S/W from the CCR were missing hosts, or listed the wrong hosts. This mode allows for the correction of those files.

The snapshot below shows the File Browser when CCR "03-0170" has been entered into the text edit window, just before the "save"/"exit":



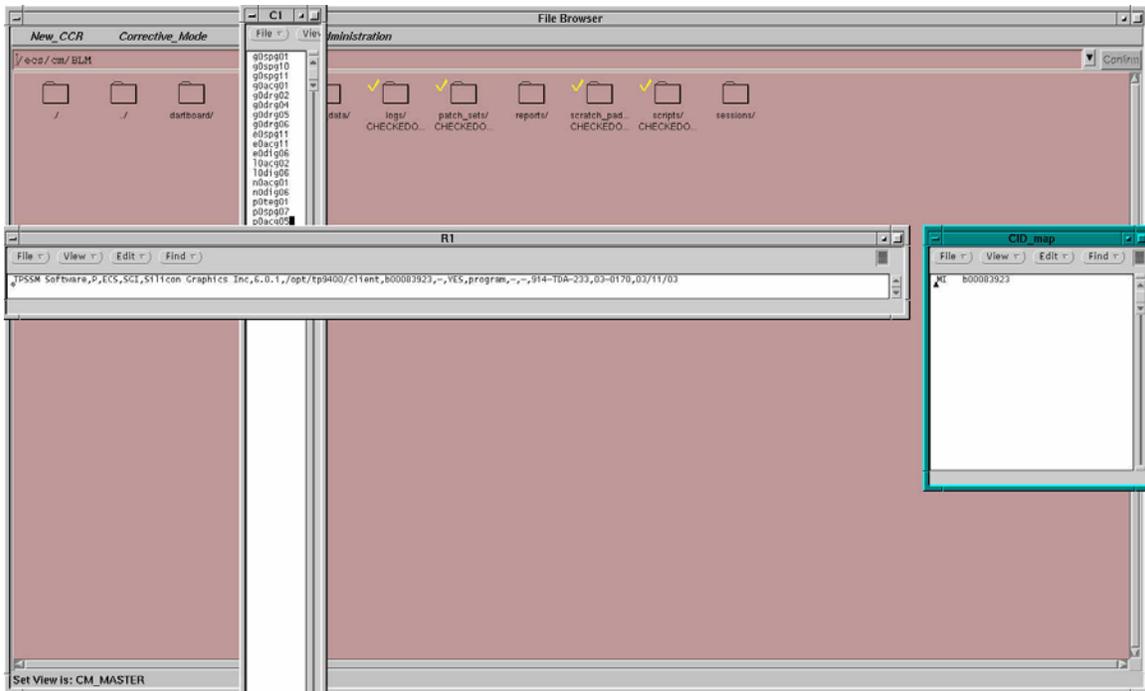
**Figure 4.3.3-11. Enter Existing CCR Number Interface**

The script will then determine the data structure for the entered CCR. The simplest structure will have one MI file. All CCRs will have the CID\_map file. The most complex CCR is an “automount” CCR, where there are 12 different Machines Impacted files, placing 12 COTS S/W products according to the MI files.

CCR # 03-0170 was chosen for its simplicity. It only has one MI file, containing 18 ECS hosts representing EDC, GSFC, LaRC, NSIDC, and the PVC. The MI file is simply named “MI”, and it references CID “b00083923”.

The next page shows the launch of three text edit windows. Each CCR will launch the CID\_map file for the entered CCR. It’s a square window, with one line for each MI/CID pairing.

Because of the nature of the files, the “MI” files are shown in columns, and the CIDs are shown as rows. CIDs are actually just one long line of characters, and the MI files may contain only one host, or over a hundred hosts.



**Figure 4.3.3-12. ClearCase BLM Interface for Modifying a ClearCase CID**

The above snapshot shows all three files. Each can be edited. Once the appropriate changes are made, then return to the “Corrective Mode” Main Menu bar item, and select either “COMMIT CCR Changes”, or “CANCEL CCR Changes”. The scripts behind the File Browser GUI will perform the necessary ClearCase CheckIns or ClearCase UnCheckouts. Also, each text edit window will close once the appropriate ClearCase commands have been executed. Checksums are performed on all of the text edit files once they were checked out of ClearCase. Once the COMMIT CCR Changes menu item is selected, all of the files are checksummed once again. If any files were edited, the checksums are different. A ClearCase CheckIn command is executed if the file has been changed (file has a different checksum), and a ClearCase UnCheckOut command is entered if the file was not changed. (file has the same checksum).

Select “Build Baseline” from the drop down menu shown by selecting the “Corrective Mode” menu item. This functions exactly like the “New\_CCR” “Build\_Baseline” item.

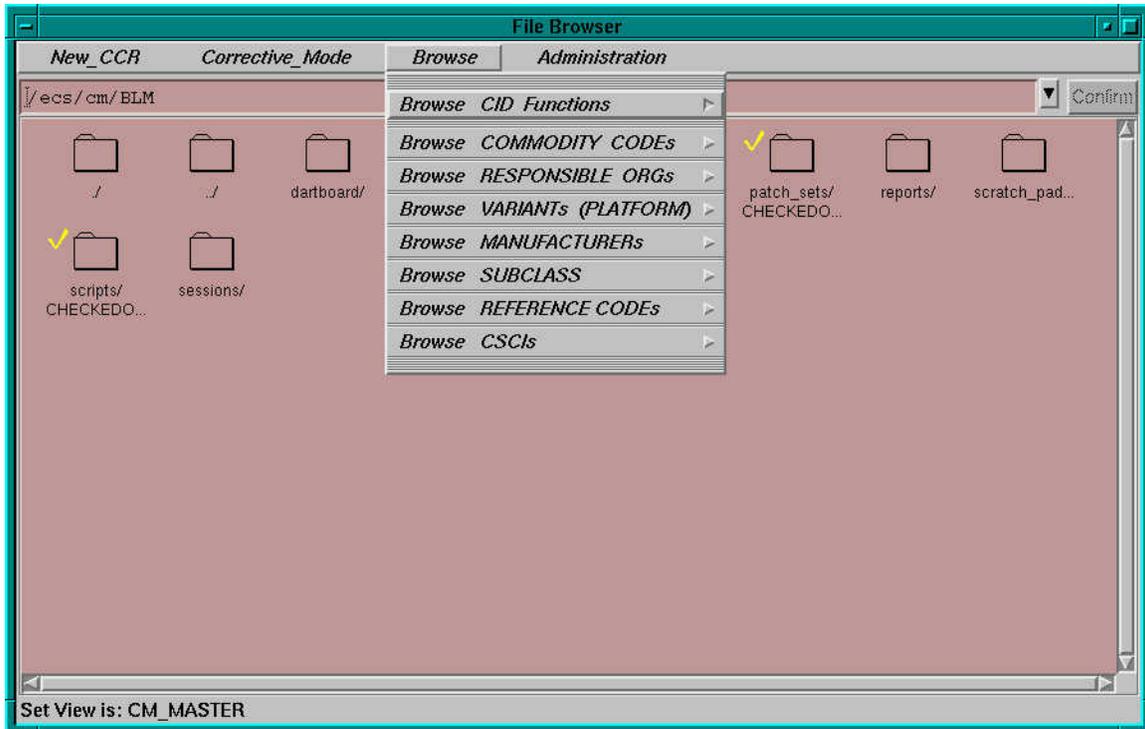
Once the /QA\_Check files look okay, select the “Promote Baseline” line item.

All changes are recorded within ClearCase history files, and there is also a ClearCase BLM Tool log file kept at /ecs/cm/BLM/logs for the Build sessions. More useful logs are emitted from the scripts are /ecs/cm/BLM/sessions/\$DISPLAY/\$TIMESTAMP/logs/ClearCase\_commands

These logs show each of the ClearCase commands exercised for all of the script executions.

#### 4.3.3.2.3 ClearCase BLM “BROWSE” GUI Drop Down Menu

This particular feature of the ClearCase BLM Tool was added late in the development of the tool. While using the tool, it became apparent that it would be nice to be able to “see” any of the data items tucked away in the tool’s repository.



**Figure 4.3.3-13. Browse Drop Down Menu**

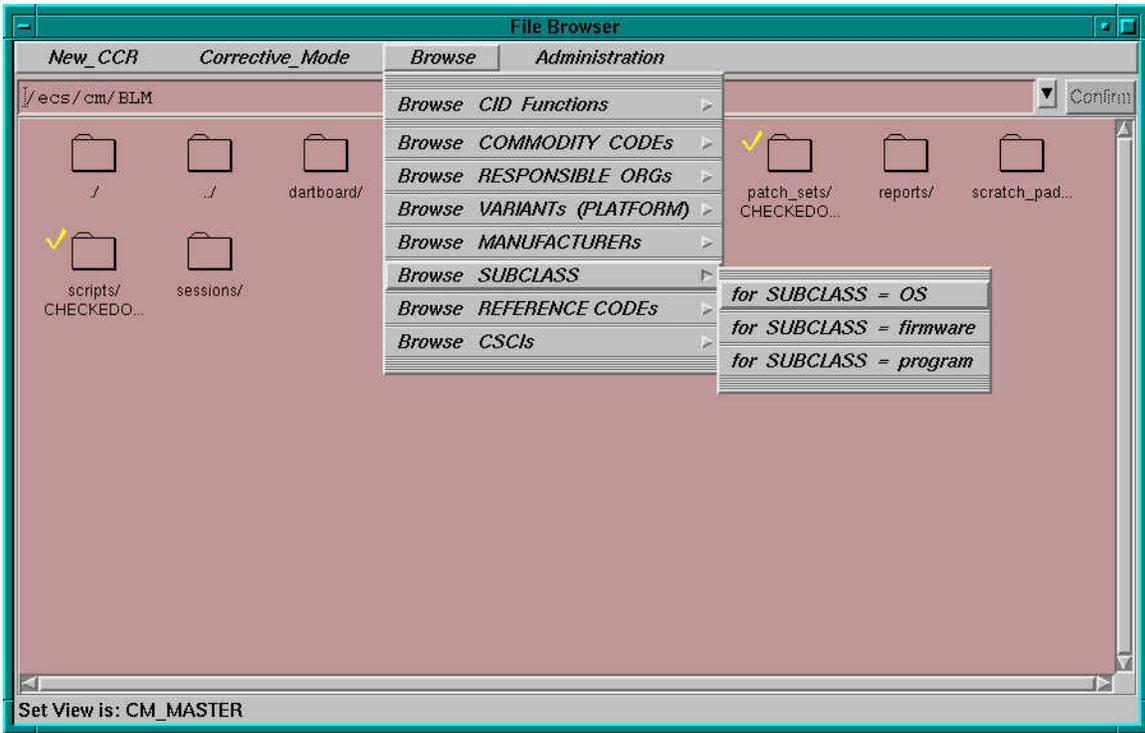
There are 8 different items that can be observed using the “Browse” selection. Each selection has a unique number of attributes that can be viewed. Windows are launched so that the GUI user can “see” the different data.

These drop down menus and data files are generated at the time that the GUI is launched, so it’s important to remember that newly added records will not appear in these windows.

In the example below, a ClearCase BLM Tool user wants to know what firmware exists within the ECS baseline.

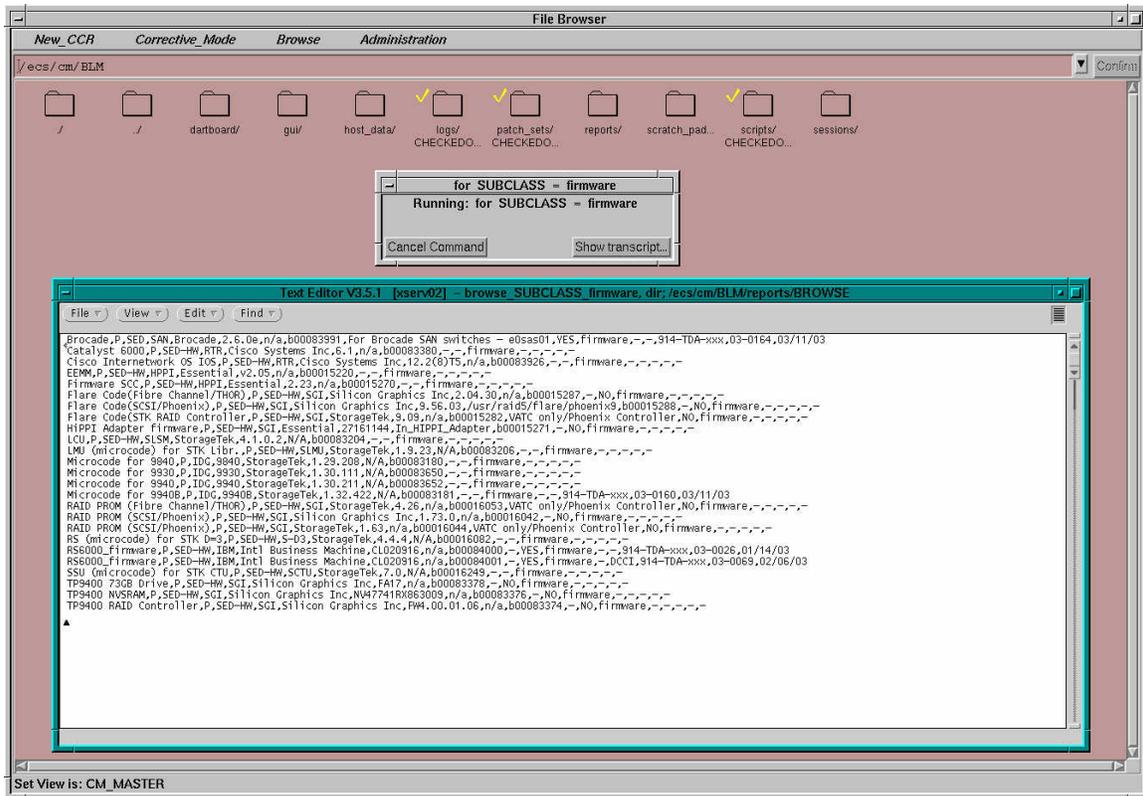
To determine this, select “Browse” from the File Browser main menu bar, then select “Browse SUBCLASS”, then “for SUBCLASS = firmware”.

Alternatively, the user could select “Browse CID Functions”, then there would show 7 different types of firmware.



**Figure 4.3.3-14. Browse Drop Down with SUBCLASS Selected**

Selecting the “for SUBCLASS = firmware” line item will return the following:



**Figure 4.3.3-15. All ECS Firmware Products Selection**

Similarly, any of the “Browse” drop down menu items may be selected.

#### 4.3.3.2.4 ClearCase BLM “ADMINISTRATION” GUI Drop Down Menu

The “Modify Users” line item under the “Administration” main menu bar enables a user to add, modify, or remove a UNIX user. The ClearCase file which facilitates this function is /ecs/cm/BLM/scripts/authorized\_DISPLAYs. Selecting the “Modify Users” line item initiates a text edit window session using the “authorized\_DISPLAYs” file. The format of this file is as follows:

The first three lines of the file are comments that identify the file’s location.

The next items are constructs that enable the BLM tool to determine authorized users of the BLM tool, and also authorized terminals. Determination is done at the time the tool is launched.

Each construct must contain at least one line for each perspective BLM tool user. Users may launch the tool from more than one location and terminal, which requires more than one line for the construct. There may be up to five fields within each line. Each field must not have any embedded spaces; spaces (blanks) are used to separate the fields. For readability, user constructs should be separated with blank lines.

The *first field* indicates the display nomenclature. For X terminals, this is the string representation of “ncdp10:0.0”, for example. This has to be the same string that is known as the DISPLAY environment variable. For PCs, this field needs to be set to the correct IP address associated with the PC. Note that the tool may be used remotely.

The *second field* contains the physical location of the terminal. This should be either “home” for off site usage, or the room or cubical number at Landover that contains the terminal.

The *third field* is the UNIX user. The UNIX user must be known to the EDF. The UNIX user format usually consists of the first letter of the first name of the user, followed by up to a maximum of 7 letters of the user’s last name, all lower case.

The *fourth field* indicates whether the terminal is a PC or an X terminal.

The *fifth field* contains the IP address resolution of the first field, if the first field is not already an IP address.

### **TO ADD A USER:**

Add a construct to the end of the file with the above fields completed. To determine the first field (DISPLAY) on a PC, run “winipcfg” from the “Start”/”Run” window. It will return the PC’s IP address. To determine the first field (DISPLAY) on an X terminal, type “printenv DISPLAY”. It will return the value of the DISPLAY environment variable.

NOTE: A newly added user must also be added to the UNIX “ccs” group and UNIX “blm\_tool” group. To determine whether a user is currently in the group, type “ypcat -k group | grep ccs” and “ypcat -k group | grep blm\_tool”. Being a member of the “ccs” group gives one write access to ClearCase BLM records within the ClearCase /ecs/cm VOB. Being a member of the “blm\_tool” group allows one to execute the ClearCase BLM scripts which are referenced by the ClearCase BLM GUI.

### **TO MODIFY A USER:**

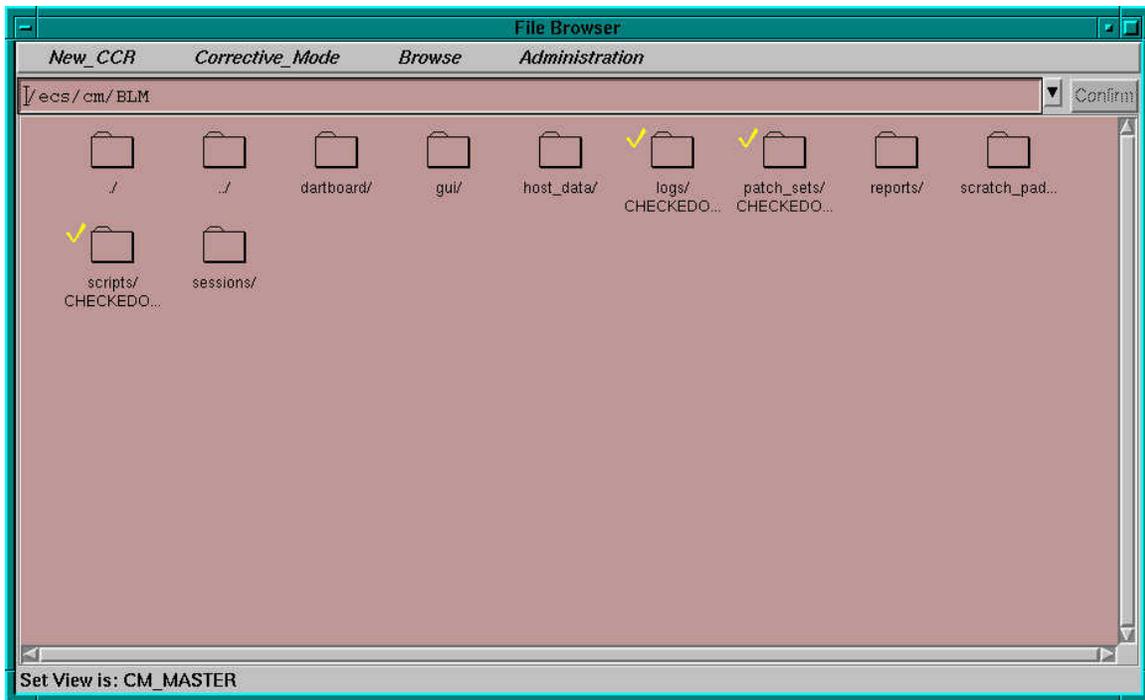
Simply edit the “authorized\_DISPLAYs” file to include the correct information.

### **TO REMOVE A USER:**

Simply delete all of the lines within the “authorized\_DISPLAYs” that contains the user’s UNIX name.

Note that the tool needs to be re launched in order for any changes in the “authorized\_DISPLAYs” file to take effect.

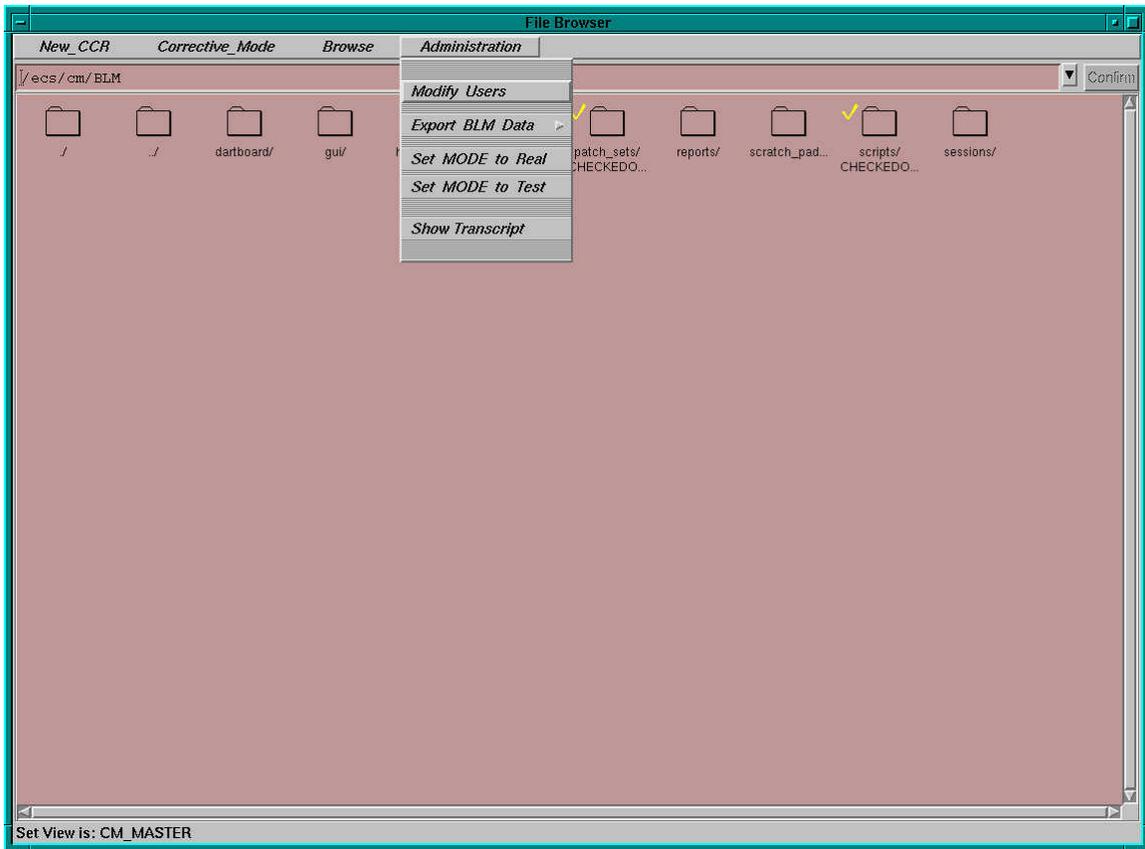
The following three snapshots show the screens which were just discussed:



**Figure 4.3.3-16. ClearCase BLM Main Menu**

This is the ClearCase BLM Main Menu. This section discusses “Administration”, which is the fourth item on the Main Menu bar.

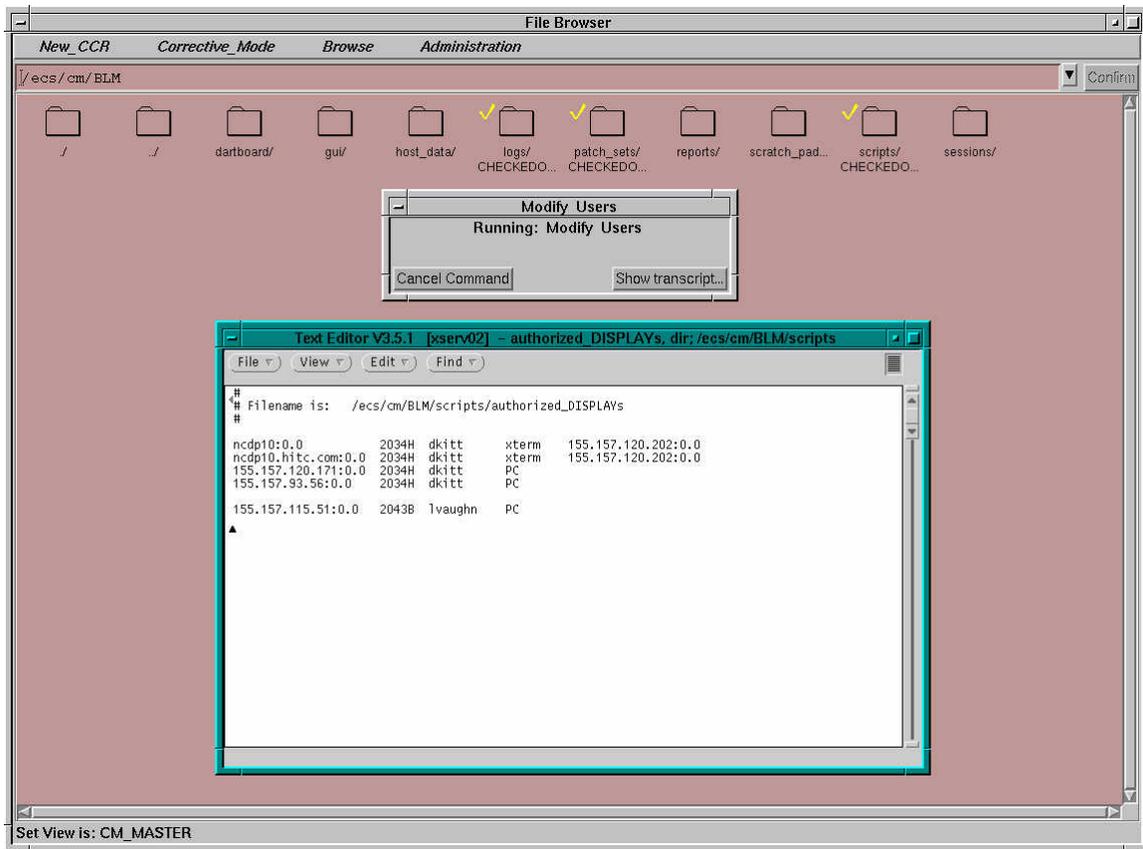
To modify a user, select “Modify Users” on the drop down menu, after selecting the “Administration” item on the main menu bar:



**Figure 4.3.3-17. Administration Drop Down Menu**

Selection of “Modify Users” will launch an x-term window. The file appears using “textedit” as the text editor. This is shown on the next page.

The text edit window shows the file that can be edited.



**Figure 4.3.3-18. Administration Modify Users Screen**

Follow earlier instructions for changing users or user information.

### 4.3.3.3 ClearCase BLM Reports

The reports that are generated using the ClearCase BLM tool are listed in Table 4.3.3-1.

**Table 4.3.3-1. ClearCase BLM Reports**

910-TDA-003	COTS S/W VERSION Baseline Report
910-TDA-005	SITE-HOST Map Report
910-TDA-023	CRITICAL COTS SOFTWARE LIST
910-TDA-030	COTS S/W Where-Used Reports
920-TDx-002	Site Hardware-Software Maps
920-TDx-014	Operating System Patch Maps

These reports are accessible at the URLs:

<a href="http://pete/baseline/">http://pete/baseline/</a>	(Landover only)
<a href="http://cmdm.east.hitc.com/baseline/">http://cmdm.east.hitc.com/baseline/</a>	(DAACs, SMC, Landover)
<a href="http://m0mss04.ecs.nasa.gov:10160/baseline/">http://m0mss04.ecs.nasa.gov:10160/baseline/</a>	(SMC only)
<a href="http://e0ins01u.ecs.nasa.gov:10160/baseline/">http://e0ins01u.ecs.nasa.gov:10160/baseline/</a>	(LPDAAC only) (aka EDC)
<a href="http://g0ins01u.ecs.nasa.gov:10160/baseline/">http://g0ins01u.ecs.nasa.gov:10160/baseline/</a>	(GES DISC only) (aka Goddard)
<a href="http://l0ins01u.ecs.nasa.gov:10160/baseline/">http://l0ins01u.ecs.nasa.gov:10160/baseline/</a>	(ASDC only) (aka LaRC)
<a href="http://n0ins02u.ecs.nasa.gov:10160/baseline/">http://n0ins02u.ecs.nasa.gov:10160/baseline/</a>	(NSIDC only)

The 910-TDA-003 report shows all of the COTS S/W that is managed on the ECS program. The software is ordered by the software function, such as “Compilers”. Each record entry lists the ECS NAME, the Commodity Code, the Responsible Organization, the Variant, the Manufacturer, the Version, the Principal Directory, the authorizing CCR, and any comments that may be needed for clarification. The report is generated when the “Build Baseline” line item is selected in the **New\_CCR** drop down menu.

The 910-TDA-005 report shows all of the ECS hosts that are managed on the ECS program. The format of the file is a matrix, with the columns containing all of a site’s hosts, with the rows showing the host names, in addition to Host Functions, Sub systems, and SRC CIs.

The 910-TDA-023 report shows COTS software products’ criticality. A critical COTS product is defined as software whose removal from the host would cause the system to not function, with respect to ECS custom code. A critical COTS product is designated by a "YES" in the first column below. A "NO" indicates that the COTS software product is not critical to the performance of the system's functions.

The 910-TDA-030 report allows a user to see all of the COTS S/W, and each host that should have it. A table containing links provides this information. For each COTS product, a link will provide the complete CID record for the product, as well as a matrix showing all of the ECS hosts. Those hosts which should have the product installed have an arrow next to each host name. These Where-Used reports are also used to provide input with new CCRs to affect changes to the baseline. Changes to the CID record, such as a new version, or new hosts, can be recorded and submitted using a mark up of this printout.

The 920-TDx-002 reports show the mapping of the COTS S/W to the managed ECS hosts. There are 8 reports, one for each site. Refer to Table 4.3.3-2.

**Table 4.3.3-2. ClearCase BLM Hardware-Software Map Reports**

920-TDE-002	LP DAAC (formerly known as EDC)
920-TDG-002	Goddard DAAC
920-TDL-002	Langley DAAC
920-TDN-002	NSIDC DAAC
920-TDS-002	SMC (at Goddard)
920-TDP-002	PVC (at Landover)
920-TDV-002	VATC (at Landover)
920-TDF-002	EDF2 (at Landover)

Each site report shows all of the COTS information for each host. The information that is shown for each host includes the host name, any host functions, specific COTS S/W that should be installed, each COTS S/W version and principle directory, the authorizing CCR, associated Release Notes document, and the effective date of the baseline change (CCR approval date).

These reports are subsequently used as a baseline reference for configuration audits.

The 920-TDx-014 reports show the mapping of the Operating System patches to the managed ECS hosts. There are 8 reports, one for each site. Refer to Table 4.3.3-3.

**Table 4.3.3-3. ClearCase BLM Operating System Patch Map Reports**

920-TDE-014	LP DAAC (formerly known as EDC)
920-TDG-014	GES DISC (formerly known as Goddard DAAC)
920-TDL-014	ASDC (formerly known as LaRC DAAC)
920-TDN-014	NSIDC DAAC
920-TDS-014	SMC (at Goddard)
920-TDP-014	PVC (at Landover)
920-TDV-014	VATC (at Landover)
920-TDF-014	EDF2 (at Landover) (consists of the Linux Evolution system)

Each site report shows all of the O/S patches for each host. The information that is shown for each host includes the host name, the O/S patch nomenclature, an O/S patch description, any related 911-TDA-xxx references, the authorizing CCR, associated Release Notes document, and the effective date of the baseline change (CCR approval date). A table at the beginning of each report shows the incorporation dates of the CCRs.

These reports are subsequently used as a baseline reference for configuration audits for Operating System patches.

EMD Baseline maintenance using the ClearCase BLM tools averages 8 hours per month.

#### **4.3.4 Remedy-ILM (Inventory, Logistics and Maintenance {ILM} Manager)**

ILM helps the M&O staffs at the DAACs and the EDF maintain records that describe all inventory items, as well as their EIN structures, repair histories, and locations. The system keeps chronological histories (a record of the transactions) of installation, relocation, movement, shipment and archiving of inventory items. ILM is used by the Property Management, Maintenance, and Logistics teams to support management of the tangible property of NASA's EOSDIS project.

ILM is a customized application of the Remedy Action Request System (ARS). The customizations adapt the product to the ILS processes used for ECS. ILM takes into account how business rules and logistics concepts are applied on the ECS project. This document does not address these considerations in detail, but the following general introduction should help.

Each inventory item is identified by a unique Equipment Inventory Number (EIN). In the case of hardware items, an EIN corresponds to a silver sticker affixed to the item. Some of the items are shipped to sites and installed. Others such as consumables are issued but not installed. After a period, some items may be transferred to other locations or relocated for use with other parent machines. Items are archived when no longer needed or serviceable. For tracking and auditing purposes, inventory items – especially hardware – are allocated to ECS “parent” machines. These parent and child relationships are called an EIN structure. EIN structures have active and inactive dates that establish the timeframe during which the pairing is in effect.

Table 4.3.4-1 summarizes the operator functions that Remedy supports. The sections that follow present how to use Remedy features that were customized for ECS inventory, logistics, and maintenance management. For more information on Remedy's Action Request System, refer to Remedy help manual.

**Table 4.3.4-1. Common ECS Operator Functions Performed with ILM**

Operating Function	GUI (Section)	Description	When and Why to Use
Property Management	ILM-EIN – 4.3.4.2.1 ILM-EIN Structure – 4.3.4.2.2 ILM-EIN Transactions – 4.3.4.2.3 ILM-Transaction Log – 4.3.4.2.4 ILM-OEM Parts – 4.3.4.2.5 ILM-Vendor-MFR – 4.3.4.2.6 ILM-HwSw Code – 4.3.4.2.7 ILM-Status Codes – 4.3.4.2.8 ILM-Maint Contract – 4.3.4.2.9 ILM-Sites – 4.3.4.2.10 ILM-Inventory Location – 4.3.4.2.11	Maintain information about accountable property items, their product structures, and inter-relationships.	To maintain information that specifies the identity, source, location, transfer, relocation, and installation of procured inventory items.
Property Maintenance	ILM-MWO – 4.3.4.3.1 ILM-MWO Line Item – 4.3.4.3.2	Manage information for required maintenance repairs.	To predefine and monitor scheduled maintenance activities
License Management	ILM-License Products – 4.3.4.4.1 ILM-License Entitlement – 4.3.4.4.2 ILM-License – 4.3.4.4.3 ILM-License Mapping – 4.3.4.4.4 ILM-Additional Host – 4.3.4.4.5	Manage entitlements, licenses, and license allocations for licensed COTS software.	To track the receipt, movement, and consumption of software licenses and their associated rights-to-use.
System Administrator	ILM-System Parameters – 4.3.4.5 User – 4.3.4.6 Remedy Admin Tool – 4.3.4.7 Database – 4.3.4.8 Special Constraints – 4.3.4.9 Outputs – 4.3.4.10 Event and Error Messages – 4.3.4.11 Reports – 4.3.4.12	Manage AR System	To revise, add, or delete Remedy ILM related objects (forms, active links, filters, menus, etc.).

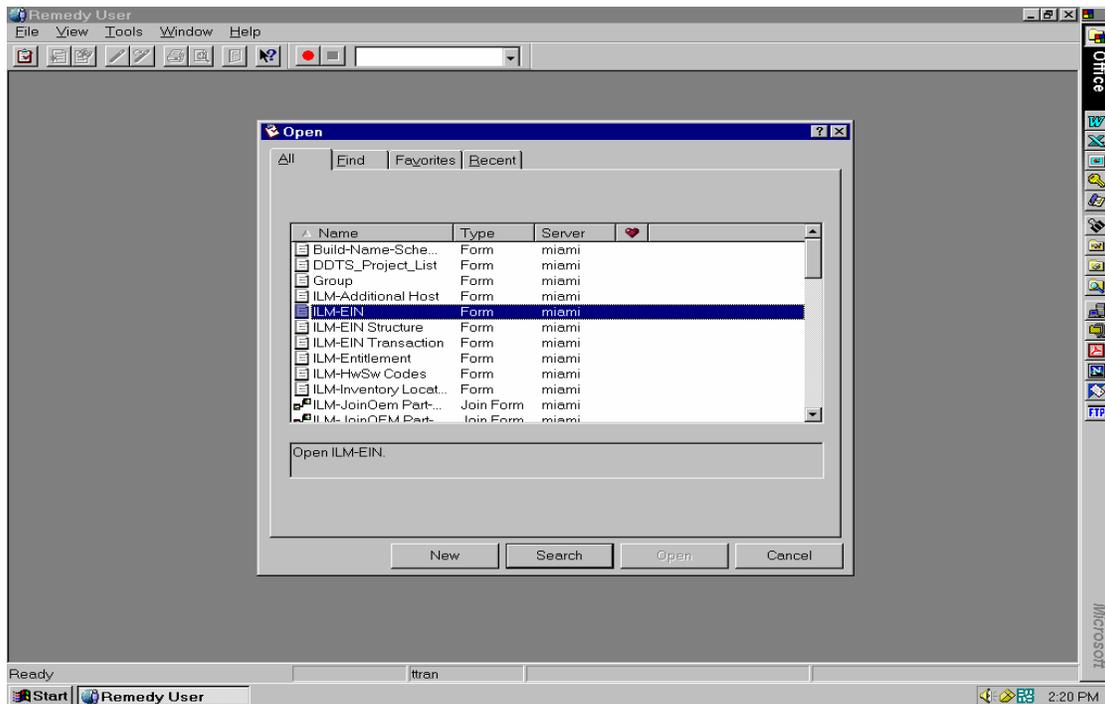
#### 4.3.4.1 Invoking Remedy-ILM from a PC

To start Remedy User, you can do one of the following:

- Click Start → Programs → Action Request System → Remedy User
- Double-click on a Remedy User icon on your desktop, if one exists.

The Remedy User screen displays. Enter your user Id and password.

Once logged into Remedy User, you can open a form. To view a list of all available forms, select **File** → **Open**, or select the Open icon, the first icon in the toolbar. This displays the complete list of forms to which the operator have access (see Figure 4.3.4.1).



**Figure 4.3.4-1. Open GUI**

Every form has a specific layout and content. Every form initially opens in one of two modes:

- **New** – to create a new record
- **Search** – to search for an existing record

#### 4.3.4.1.2 ILM-Roles

The following are ILM-related roles Remedy is deployed pre-configured to support:

- ILMadmin - full privileges to all operator and system administrator functions within ILM;
- ILMproperty - all ILM property privileges only;
- ILMmaint - maintenance management data update privileges for central ILS managers;

- ILMdaacAdmin - full privileges to all operator and system administrator functions within ILM for a site's local maintenance coordinator;
- ILMdaacMaint - maintenance management data update privileges for a site's local maintenance coordinator;
- ILMquery - ILM data query privileges only;
- ILMlicuser - license management data update privileges for software license administrators;

The following sections will discuss all of ILM's forms in more detail.

#### **4.3.4.2 Property Management**

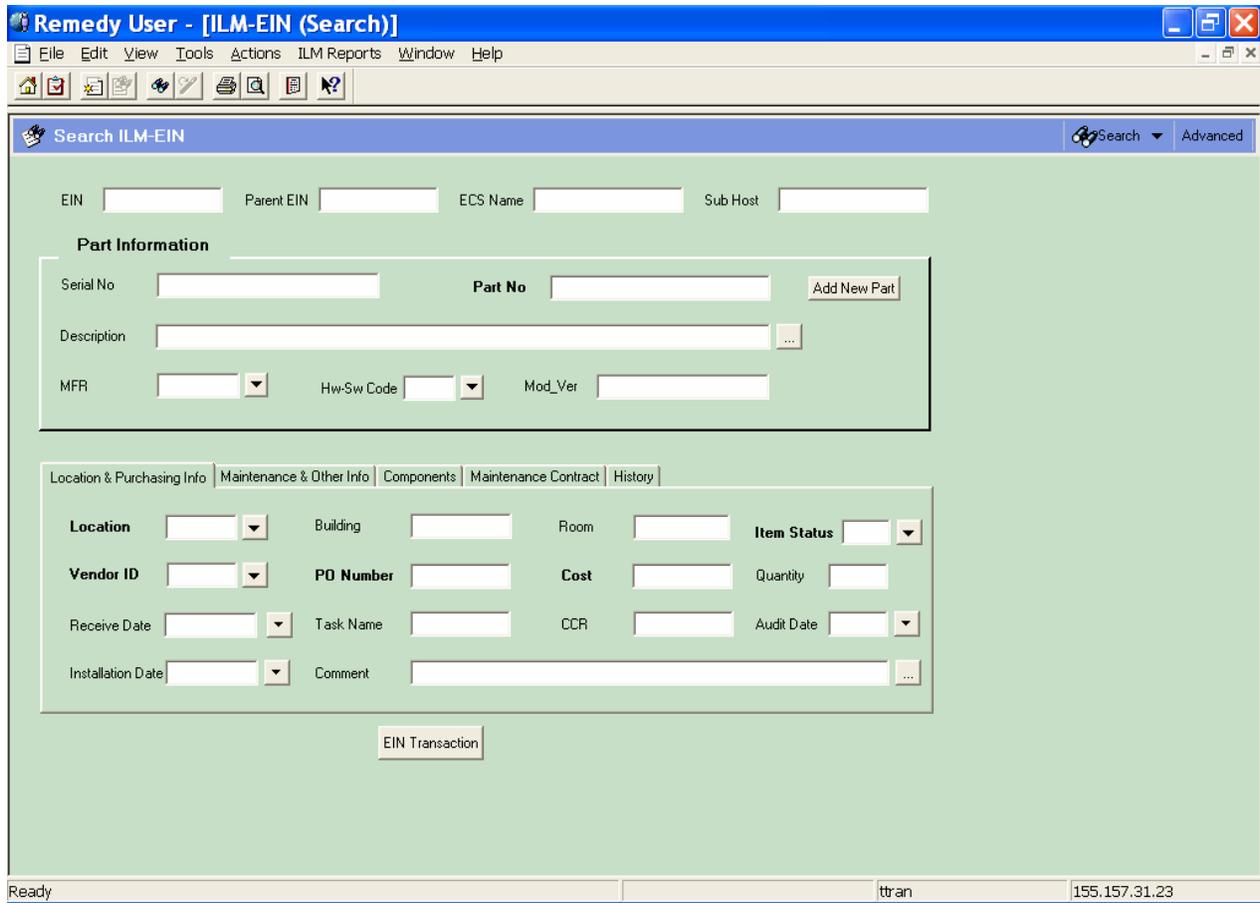
Remedy provides the M&O staffs at the EDF and the DAACs the capability to maintain inventory records, including EIN structures. Property Administrators can submit new records, modify existing ones, and perform transactions that capture installation, relocation, movement, shipment and archive activities. These transactions are logged for historical purposes. The following forms provide the mechanism to perform the aforementioned tasks:

- ILM-EIN – is designed to create, modify, and view all inventory items and their assemblies.
- ILM-EIN Structure – is designed for viewing the structure of a machine.
- ILM-EIN Transactions – provides Property Administrator the capability to perform the following EIN transactions: Installation, Relocation, Movement, Shipment, and Archive.
- ILM-OEM Parts – records manufacturers' or vendor's part numbers and other parts information.
- ILM-Vendor-MFR – records vendors and manufacturers information
- ILM-HwSw Code- records inventory items type
- ILM-Status – records inventory status
- ILM-Maint Contract – maintains maintenance contracts information
- ILM-Transaction Log – Logs all the transactions performed on inventory items.

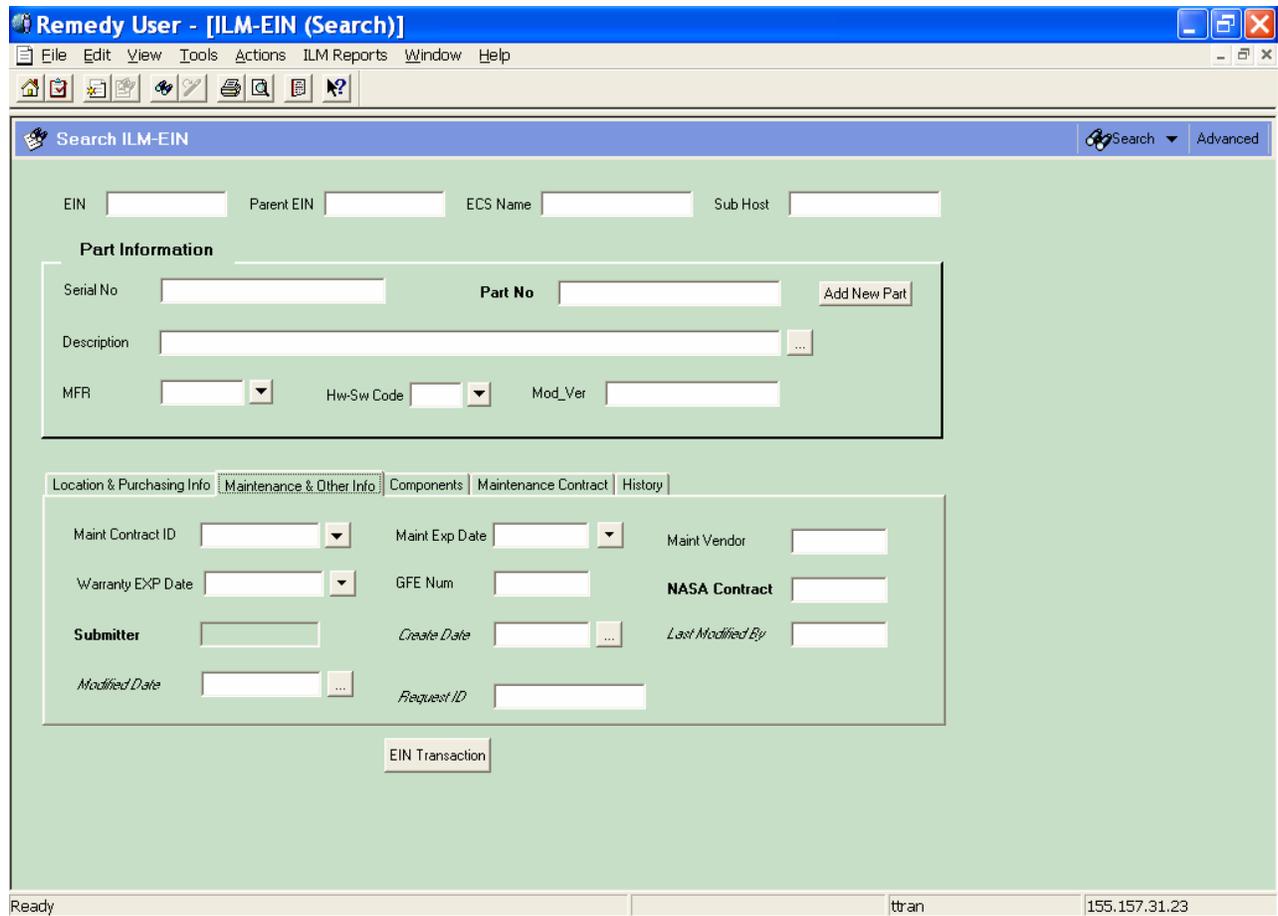
The following sections will describes each of these forms in more detail.

##### **4.3.4.2.1 ILM-EIN GUI**

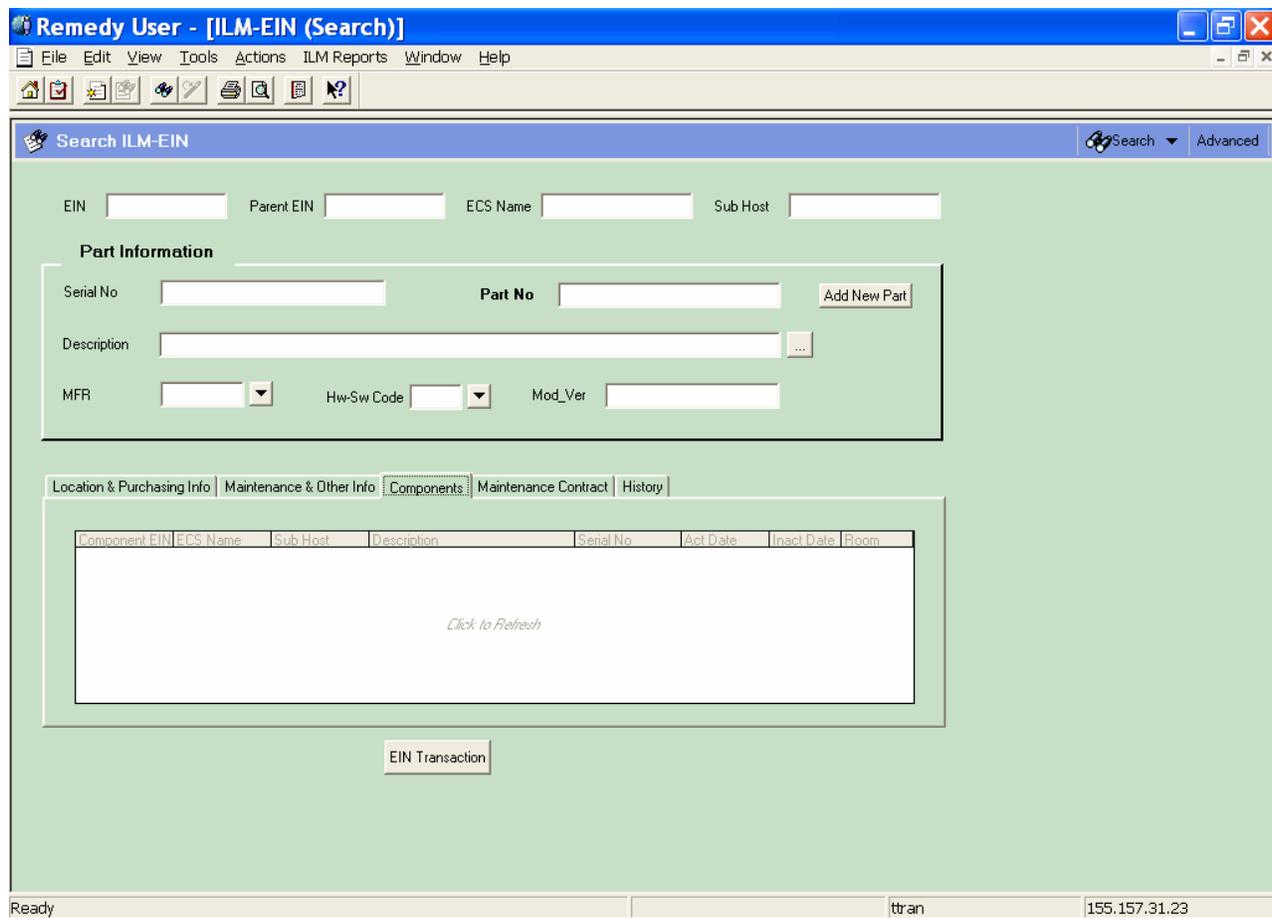
The ILM-EIN form (Figures 4.3.4-2 – 4.3.4-6) is used for creating, viewing or modifying all EMD inventory items's records. In addition, this form allows the Property Administrator to create and modify EIN structures via the Parent EIN field. Other ILM groups may view and perform reports on this form.



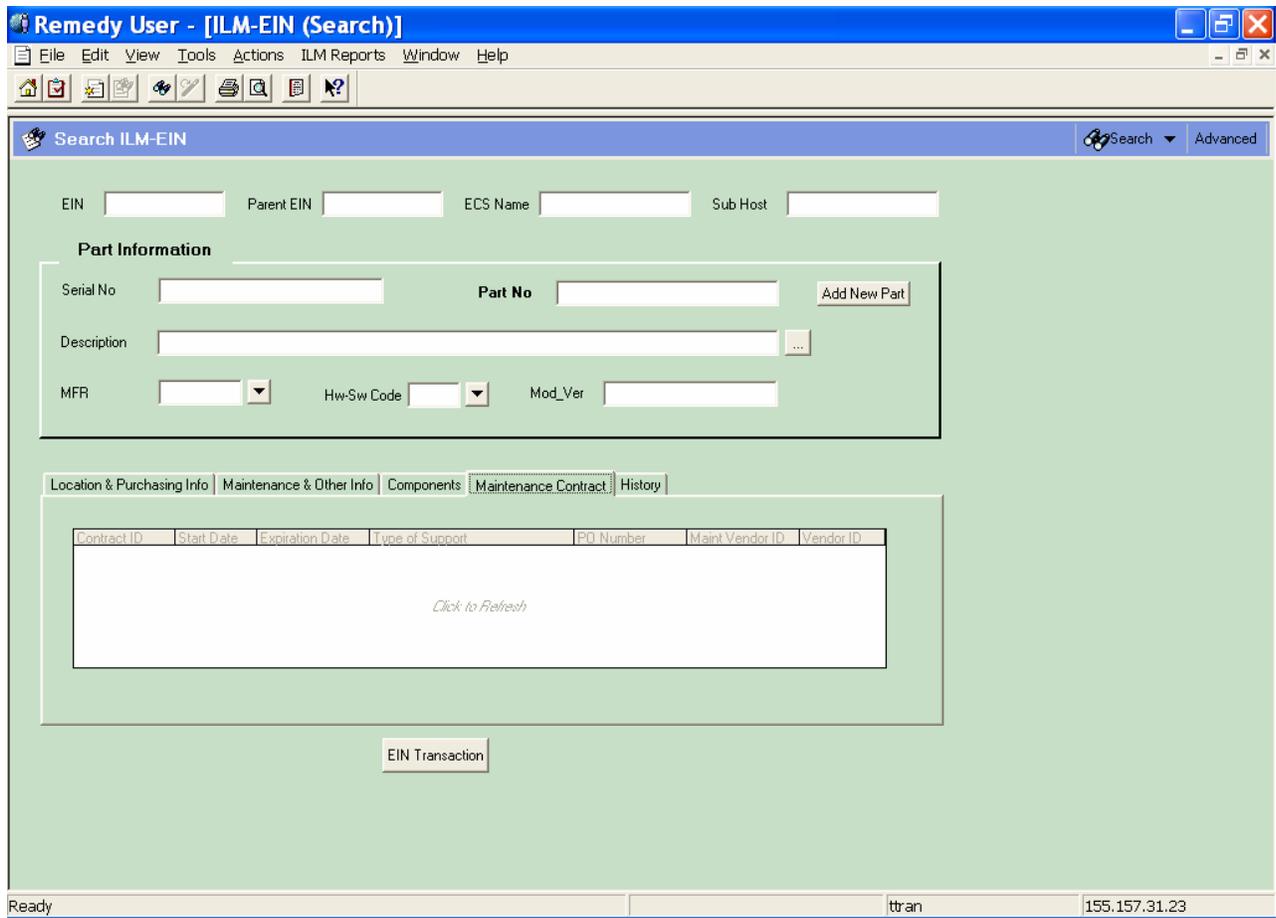
**Figure 4.3.4-2. ILM-EIN (Part Info and Location & Purchasing Info) GUI (1 of 5)**



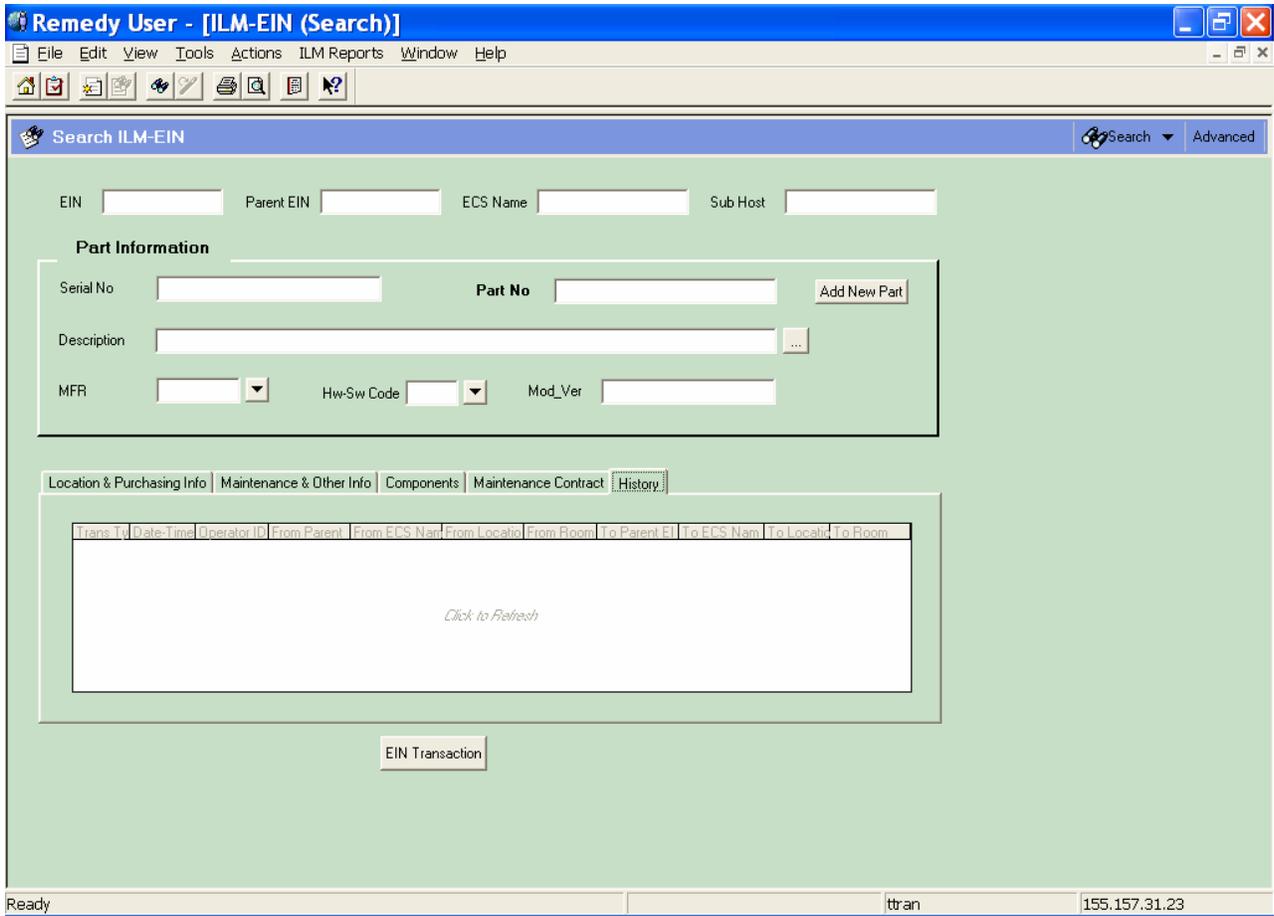
**Figure 4.3.4-3. ILM-EIN (Maintenance & Other Info.) GUI (2 of 5)**



**Figure 4.3.4-4. ILM-EIN (Components) GUI (3 of 5)**



**Figure 4.3.4-5. ILM-EIN (Maintenance Contract) GUI (4 of 5)**



**Figure 4.3.4-6. ILM-EIN (History) GUI (5 of 5)**

Table 4.3.4-2 describes the fields on the ILM-EIN form.

**Table 4.3.4-2. ILM-EIN Form Fields Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
EIN	Char	20	optional	Identifier for an inventory item.
Parent EIN	Char	20	optional	EIN of the host of which this item is a component.
ECS Name	Char	30	optional	Name of the machine with which the item is associated.
Sub Host	Char	30	optional	Sub host is use to identify individual hosts within a main host. For example: Communication Rack, Rack will have 1 name installed. Items in the rack can each have a different name, this name is put into the sub host field.
Serial No	Char	30	optional	Manufacturer's serial number of the item.
Part No	Char	34	optional	Manufacturer's or vendor's part number.
Description	Char	80	optional	Manufacturer's or vendor's description for the item.
MFR	Char	6	optional	Code used for the manufacturer.
Hw-Sw Code	Char	2	optional	Code for classifying inventory items by type.
Mod-Ver	Char	24	optional	Model or version of the item.
Location & Purchasing Info.			Page	Contains the following fields about the EIN item: Location, Building, Room, Item Status, Vendor ID, PO Number, Cost, Quantity, Receive Date, Installation date, and Audit Date.
Location	Char	6	optional	Identifier that designates an inventory location.
Building	Char	6	optional	Identifier for the building where the item can be found.
Room	Char	15	optional	Identifier for the room where the item can be found.
Item Status	Char	1	Optional, default R.	Code that designates the status of the item. The following values are set when processing transactions: R = Received; SP = Spare Equipment; I = Installed; X = Archived;
Vendor ID	Char	6	required	Code for the Vendor from whom the item was purchased.
PO Number	Char	10	Required	Identifier of the purchase order against which the item was received.
Cost	Decimal	10.2	optional	Purchase cost of the item.
Quantity	Integer	4	Optional	Number of items purchased on a particular purchase order
Receive Date	Char		optional	Date item was received from vendor.
Task Name	Char	10	optional	Name of the task order under the EMD contract that the item was originally purchased for.
CCR	Char	10	optional	Approved CCR number that requested the purchasing of the item.
Audit Date	Date		optional	Date the item was physically inventoried last
Installation Date	Date		optional	Date the item was installed. The system sets the value during EIN Installation processing.
Comment	Char	120	optional	Miscellaneous information specific to the item.

**Table 4.3.4-2. ILM-EIN Form Fields Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Maintenance & Other Info.			Page	Contains the following fields about the EIN item: Maint Contract ID, Maint Exp Date, Maint Vendor, Warranty Exp Date, EMOSD ID, GFE Num, Comment, NASA Contract, Submitter, Create Date, and Last Modified By.
Maint Contract ID	Char	10	optional	Identifier for the Maintenance Contract under which the item is covered.
Maint Exp Date	Date		optional	Date the maintenance contract will expire. This field reflects the Expiration Date from the Maint Contract ID entered above.
Maint Vendor	Char	6	optional	Code for the vendor the maintenance contract were purchased from.
Warranty EXP Date	Date		optional	Date that the warranty expires.
GFE NUM	Char	8	optional	Identifier assigned by the Government to an item of government furnished equipment.
NASA Contract	Char	11	Optional, default NAS5-60000	Identifier designating the government contract used for this item. This information is automatically assigned and can not be changed.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The user last modified the record.
Modified Date	Date/Time		System-supplied	The last date/time the record was modified.
Request ID	Char	15	System-supplied	Provides record identifier.
Components			Page	Page for displaying the components of a parent EIN. It displays the Component EIN, ECS Name, Sub Host, Description, Serial No, Active Date, Inactive Date, and Room.
Maintenance Contract			Page	Page displays attributes of the maintenance contract, such as the Contract ID, Start Date, Expiration Date, Type of support, PO number, maintenance vendor, and vendor ID.
History			Page	Contains a listing of EIN transaction history for the EIN. This table displays the following fields describing the transactions: Trans Type, Date-Time, Operator ID, From Parent EIN, From ECS Name, From Location, From Room, To Parent EIN, To ECS Name, To Location, and To Room.

The following buttons are unique to this form:

- Add New Part – Activates the ILM-OEM Parts form. This allows the operator to add new parts or to search for existing parts.
- EIN Transaction – brings up the ILM-EIN Transaction form.

#### 4.3.4.2.2 ILM-EIN Structure GUI

The ILM-EIN Structure form (Figure 4.3.4-7) is designed to allow an Administrator to repair EIN structure records. Other ILM groups may view EIN Structure via the ILM-EIN form discussed in the previous section. To make changes to EIN Structures, always use the ILM-EIN Transaction form that is discussed in Section 4.3.4.2.3.

The screenshot shows a web browser window titled "Remedy User - [ILM-EIN Structure (New)]". The browser's address bar and menu bar are visible. The main content area is a form titled "New ILM-EIN Structure" with a "Save" button in the top right corner. The form is organized into several sections:

- Parent Information:** Contains fields for "Parent EIN", "Component EIN", "Active Date" (with a dropdown arrow), "Inactive Date" (with a dropdown arrow), "Process" (with a dropdown arrow), "Submitter" (containing "ttran"), "Create Date" (with a calendar icon), and "Last Modified By".
- Parent Information (Detailed):** A larger section containing fields for "ECS Name", "System Serial No", "Part No", "MFR" (with a dropdown arrow), "Description", "Location" (with a dropdown arrow), "Building", and "Room".
- Components:** A table with the following columns: "Component EIN", "ECS Name", "Description", "Serial No", "Act Date", "Inact Date", "Location", and "Room". The table is currently empty, and a "Click to Refresh" button is centered below it.

The status bar at the bottom of the browser window displays "Ready", the user name "ttran", and the IP address "155.157.31.23".

**Figure 4.3.4-7. ILM-EIN Structure GUI**

Table 4.3.4-3 contains descriptions of the ILM-EIN Structure form's fields.

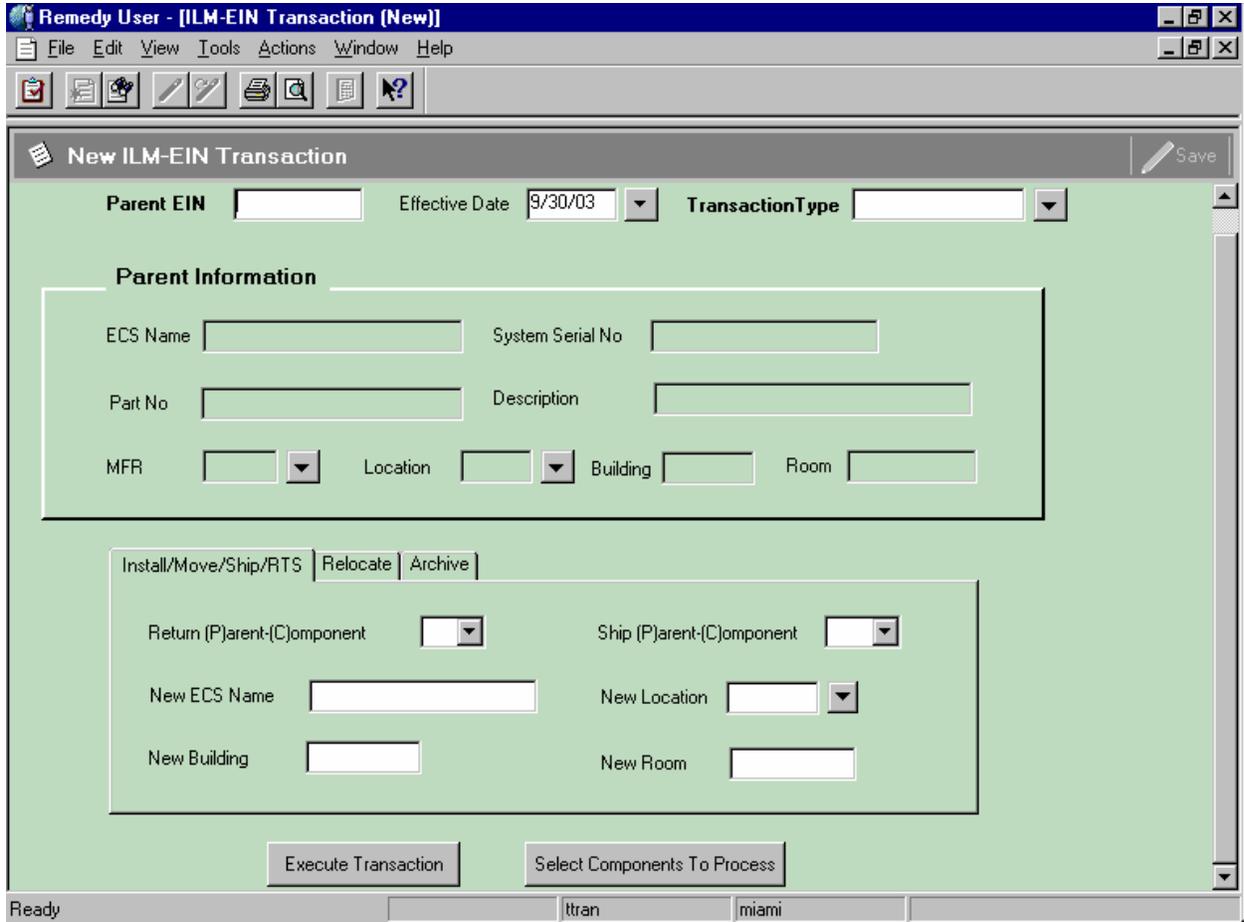
**Table 4.3.4-3. ILM-EIN Structure Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Parent EIN	Char	20	Required	EIN for the parent item in an EIN structure.
Component EIN	Char	20	Required	Identifier for an EIN controlled inventory item.
Active Date	Date		Required	Date the item was added to the parent structure
Inactive Date	Date		Optional	Date the component is no longer assigned to the Parent EIN.
Process	Char	1	Optional	Identifier for Component EIN to be processed by EIN transactions
Submitter	Char	30	Required	User ID of user who submitted the record.
Create Date	Date/Time		System-supplied	Indicates date that the record was created.
Last Modified By	Char	30	System-supplied	Indicates the user who last modified the record.
ECS Name	Char	30	System-supplied	Name of the machine with which the item is associated. This field reflects the ECS Name of the Parent EIN entered above.
System Serial No	Char	30	system-supplied	Serial number of the item. This field reflects the serial no of the Parent EIN entered above.
Part No	Char	34	optional	Manufacturer's or vendor's number for the part.
MFR	Char	6	system-supplied	Code for the manufacturer of the item. This field reflects the MFR of the Parent EIN entered above.
Description	Char	60	system-supplied	Manufacturer's or vendor's description for the item. This field reflects the Description of the Parent EIN entered above.
Location	Char	6	system-supplied	Identifier that designates an inventory location. This field reflects the location of the Parent EIN entered above.
Building	Char	6	system-supplied	The building where the item can be found.
Room	Char	15	system-supplied	The room where the item can be found. This field reflects the room of the Parent EIN entered above.
Components	Table field		system-supplied	Field for displaying the components of a parent EIN.

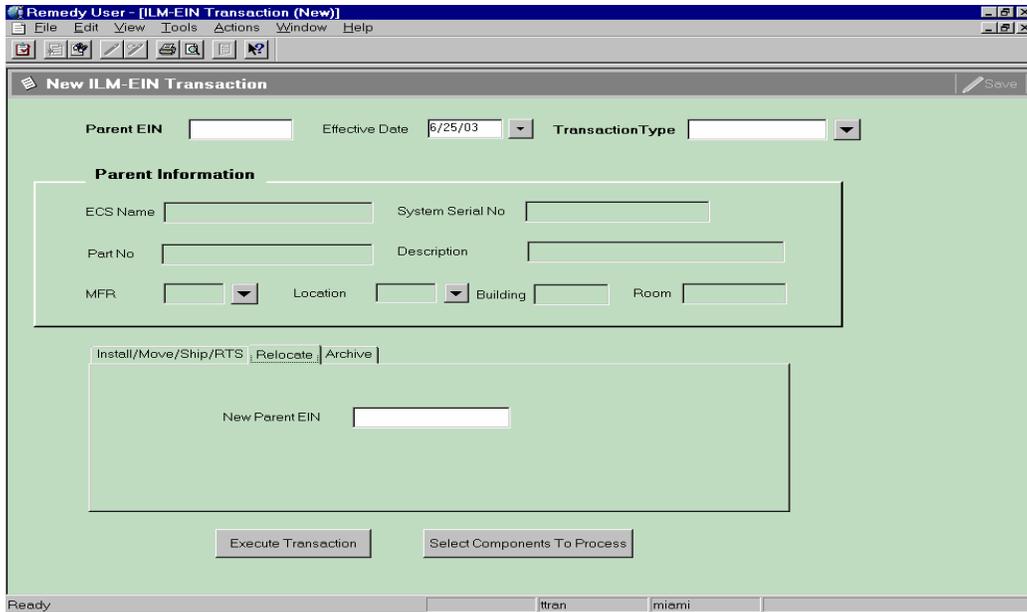
#### 4.3.4.2.3 ILM-EIN Transaction GUI

The ILM-EIN Transaction form (Figures 4.3.4-8 to 4.3.4-10) enables the operator to perform the following EIN transactions for inventory items: Installation, Relocation, Return to Stock, Movement, Shipment, and Archive. The operator may select the type of transaction from the drop down list on the Transaction Type field as displayed below. Depending on the type of transaction the operator selects, Remedy will perform inventory updates accordingly. In addition, this form has three tabs: Install/Move/Ship/RTS, Relocate, and Archive. Each tab

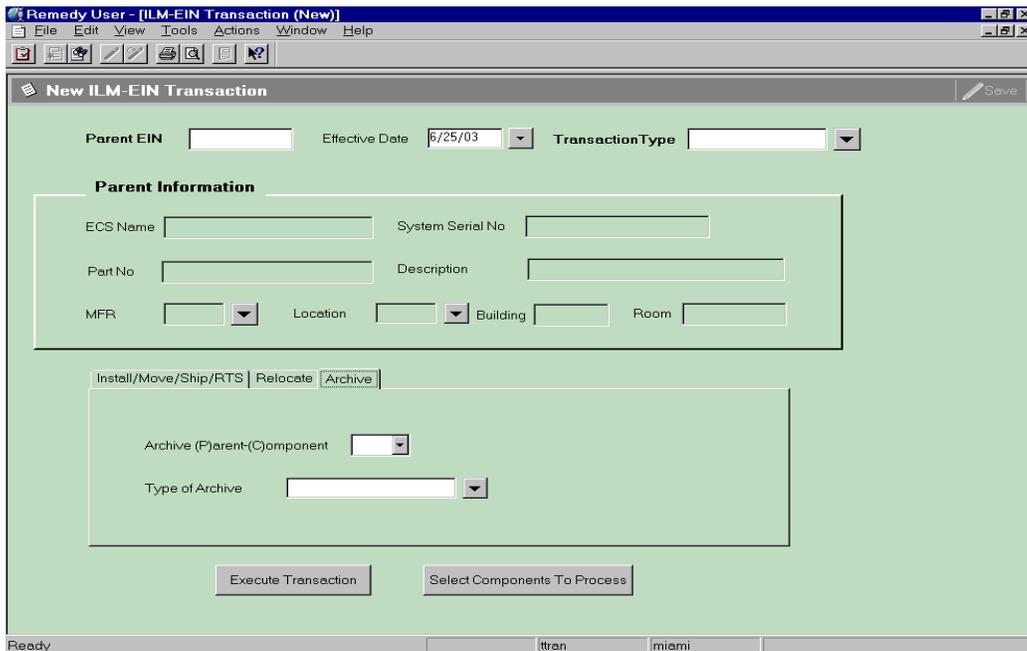
contains different information. For instance, Install/Move/Ship/RTS tab contains fields that are applicable to EIN Installation, EIN Movement, EIN Shipment, and Return To Stock. Relocate tab displays fields for EIN Relocation. Archive tab displays field for EIN Archive. The operator can specify components to be processed by pressing the “Select Components to Process” button. Remedy then transfers the operator to the ILM-Process Component form to complete the transaction. Figures 4.3.4.8 to 4.3.4-10 display fields for each tab and Table 4.3.4-4 provides the fields definitions for this form.



**Figure 4.3.4-8. ILM-EIN Transaction (Install/Move/Ship/RTS) GUI (1 of 3)**



**Figure 4.3.4-9. ILM-EIN Transaction (Relocation) GUI (2 of 3)**



**Figure 4.3.4-10. ILM-EIN Transaction (Archive) GUI (3 of 3)**

Table 4.3.4-4 provides the fields definitions for the ILM-EIN Transaction form.

**Table 4.3.4-4. ILM-EIN Transaction Form Fields Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
Parent EIN	Char	20	required	EIN for the parent item in an EIN structure.
Effective Date	Date		Optional	The date the transaction is in effect.
Transaction Type	Char	15	Required	Type of transaction performs on the Parent EIN such as Installation, relocation, movement, shipment, and archive.
ECS Name	Char	30	System-supplied	Name of the machine with which the item is associated. This field reflects the ECS Name of the Parent EIN entered above.
System Serial No	Char	30	system-supplied	Serial number of the item. This field reflects the serial no of the Parent EIN entered above.
Part No	Char	34	system-supplied	Manufacturer's or vendor's part number. This field reflects the Part No of the Parent EIN entered above.
Description	Char	60	system-supplied	Manufacturer's or vendor's description for the item. This field reflects the Description of the Parent EIN entered above.
MFR	Char	6	system-supplied	Code for the manufacturer of the item. This field reflects the MFR of the Parent EIN entered above.
Location	Char	6	system-supplied	Identifier that designates an inventory location. This field reflects the location of the Parent EIN entered above.
Building	Char	6	system-supplied	The building where the item can be found.
Room	Char	15	system-supplied	The room where the item can be found. This field reflects the room of the Parent EIN entered above.
Install/Move/Ship/RTS	Page		N/A	This page contains the following fields to perform the EIN Installation, Movement, Shipment, and Return to Stock: Return (P)arent-(C)omponent, Ship (P)arent-(C)omponent, New ECS Name, New Location, New Building, and New Room.
Return (P)arent-(C)omponent	Char	1	Optional, P or C	Identify whether the operator will return Parent and all of the components or return subset of components.
Ship (P)arent-(C)omponent	Char	1	Optional, P or C	Identify whether the operator will ship Parent and all of the components or ship subset of components.
New ECS Name	Char	30	Optional	New ECS Name for the Parent EIN.
New Location	Char	6	Optional	New Location where the item will be at.
New Building	Char	6	Optional	New Building where the item will be.
New Room	Char	15	Optional	New room where the item will be located.

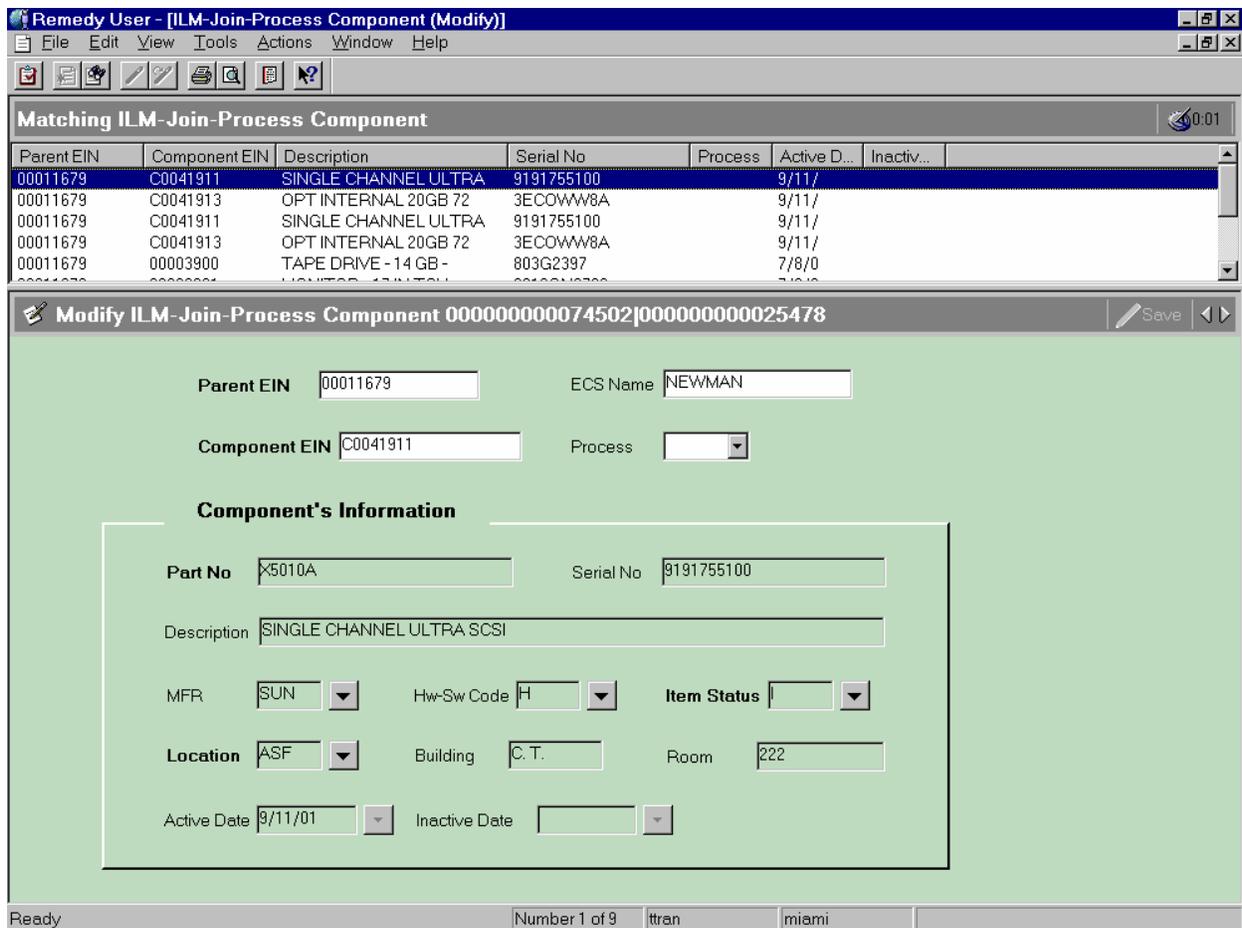
**Table 4.3.4-4. ILM-EIN Transaction Form Fields Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Relocate	Page		N/A	This page contains the New Parent EIN field for user to perform EIN relocation.
New Parent EIN	Char	20	Optional	New Parent EIN to which the item(s) will be associated with.
Archive	Page		N/A	This page contains the following fields to perform EIN archive: Archive (P)arent-(C)omponent and Type of Archive.
Archive (P)arent-(C)omponent	Char	1	Optional, P or C	Identify whether the operator will archive the Parent as well as all the active components or archive a subset of components.
Type of Archive	Char	6	Optional, X,TV,G, RG	Define the type of archive the item(s). Return to Vendor – X, Trade in to vendor - TV Transferred to government - G Government Relieved Accountability - RG

- ◆ Pressing the Execute Transaction button will cause the processing of the transaction and the updating of the inventory items in accordance with the type of transaction the operator selected.
- ◆ Pressing the “Select Components to Process” button will bring up the ILM-Process Component form. This button is visible only when the transaction is associated with components.

**4.3.4.2.3.1 ILM-Join-Process Component GUI**

The ILM-Join-Process Component form (Figure 4.3.4-11) displays all the active components for the Parent EIN entered in the ILM-EIN Transaction form and lets the operator specify component to undergo an EIN transaction. This form can be accessed through the “Select Components To Process” button on the bottom of the ILM-EIN Transaction form. However, this button is only visible when the transaction is being performed on components only. For example, the “Select Components To Process” button becomes visible when the user selects to return components (Return (P)arent-(C)omponent) to stock, or relocate components to a new EIN Structure, or archive selected components.



**Figure 4.3.4-11. ILM-Join-Process Component GUI**

Table 4.3.4-5 provides fields definitions for the ILM-Join-Process Component Form.

**Table 4.3.4-5. ILM-Join-Process Component Form Fields Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
Parent EIN	Char	20	System-supplied	EIN for the parent item in an EIN structure.
ECS Name	Char	30	system-supplied	Name of the machine with which the item is associated.
Component EIN	Char	20	system-supplied	EIN for the Component item in an EIN structure.
Process	Char	1	Optional	Indicates whether or not a component is to be processed. Y = Yes, N = No.
Part No	Char	34	system-supplied	Manufacturer's or vendor's part number.

**Table 4.3.4-5. ILM-Join-Process Component Form Fields Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Serial No	Char	30	system-supplied	Serial number of the item.
Description	Char	60	system-supplied	Manufacturer's or vendor's description for the item.
MFR	Char	6	system-supplied	Code for the manufacturer of the item.
Hw-Sw Code	Char	2	system-supplied	Code for classifying items according to source of inventory. This code is provided automatically. Do not change it, manually.
Item Status	Char	1	system-supplied	Code that designates the status of the item.
Location	Char	6	system-supplied	Identifier that designates an inventory location.
Building	Char	6	system-supplied	The build where the item can be found.
Room	Char	15	system-supplied	The room where the item can be found.
Active Date	Date		system-supplied	Date the item was added to the parent structure
Inactive Date	Date		system-supplied	Date the component is no longer assigned to the EIN Structure.

#### 4.3.4.2.3 ILM-Transaction Log

ILM-Transaction Log form (Figure 4.3.4-12) is designed for viewing/browsing all the EIN transactions performed on property records. Remedy logs the type of transaction, date/time, operator initiating the transaction, ECS name, Parent EIN, and location changes. This form also shows property record changes due to maintenance actions performed on inventory items (refer to Section 4.3.4.3 for description of maintenance actions.).

Remedy User - [ILM-Transaction Log (New)]

File Edit View Tools Actions Window Help

New ILM-Transaction Log

Transaction No: TRANS Trans Type: Date-Time: Operator ID:

**EIN Information**

EIN: ECS Name: Serial No: Part No: Description: MFR:

Item Status: Location: Building: Room:

**From**

From Parent EIN: From ECS Name: From Location: From Building: From Room:

**To**

To Parent EIN: To ECS Name: To Location: To Building: To Room:

Ready ttran 155.157.31.23

**Figure 4.3.4-12. ILM-Transaction Log GUI**

Table 4.3.4-6 describes the fields on the ILM-Transaction Log form.

**Table 4.3.4-6. ILM-Transaction Log Form Fields Descriptions (1 of 2)**

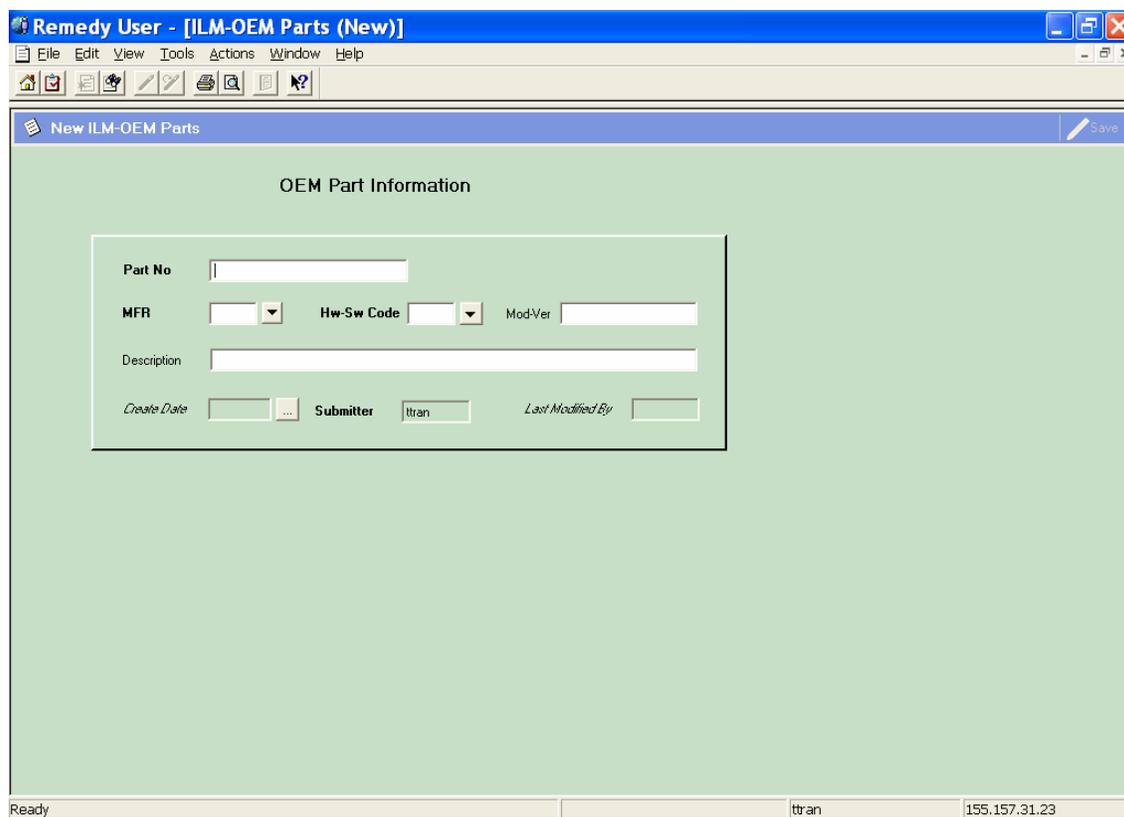
Field Name	Data Type	Size	Entry	Description
Transaction No	Numeric	10	system-supplied	A system generated number that uniquely identify the transaction.
Trans Type	Char	5	system-supplied	The type of transaction operators perform on an inventory item, including: INS - Install, MVE – Move, REL - Relocate, ARC – Archive, MFS – Failed and Returned to Stock, MFV – Failed and returned to the vendor, MNS – New and came from stock, MNV – New and came from vendor, MRR – Relocate to a new Parent via the MWO, and MRS – Relocate to stock via the MWO.
Date-Time	Date		system-supplied	Date and time the transaction occurred.
Operator ID	Char	10	system-supplied	The operator id who performed the transaction.
EIN	Char	20	system-supplied	The EIN number that the transaction performed on.
ECS Name	Char	30	system-supplied	Name of the machine with which the item is associated.
Serial No	Char	30	system-supplied	Serial number of the item
Part No	Char	30	system-supplied	Manufacture's or vendor's part number.
Description	Char	60	system-supplied	Manufacturer's or vendor's description of the item.
MFR	Char	6	system-supplied	Code for the manufacturer of the item
Item Status	Char	1	Optional, default R.	Code that designates the status of the item. The following values are set when processing transactions: R = Received; SP = Spare Equipment; I = Installed; X = Archived;
Location	Char	6	system-supplied	Identifier that designates an inventory location. This field reflects the location of the Parent EIN entered above.
Building	Char	6	system-supplied	The building where the item can be found.
Room	Char	15	system-supplied	The room where the item can be found. This field reflects the room of the Parent EIN entered above.
From Parent EIN	Char	20	system-supplied	The parent EIN where the EIN originated from.
To Parent EIN	Char	20	system-supplied	The new parent EIN where the EIN is locating.

**Table 4.3.4-6. ILM-Transactions Log Form Fields Descriptions (2 of 2)**

<b>Field Name</b>	<b>Data Type</b>	<b>Size</b>	<b>Entry</b>	<b>Description</b>
From ECS Name	Char	30	system-supplied	Name of the machine with which the item is associated
To ECS Name	Char	30	system-supplied	Name of the machine with which the item is associated
From Location	Char	6	system-supplied	The original location where the EIN was.
To Location	Char	6	system-supplied	The new location where the EIN can be found.
From Building	Char	6	system-supplied	The original building where the EIN was located.
To Building	Char	6	system-supplied	The new building where the EIN is located.
From Room	Char	15	system-supplied	The Original room where the EIN located.
To Room	Char	15	system-supplied	The new room where the EIN can be found.

#### **4.3.4.2.6 ILM-OEM Parts GUI**

Operators use the ILM-OEM Parts form (Figure 4.3.4-13) to maintain standardized information about manufacturer's parts. Parts information must be recorded in the ILM-OEM Parts form before they can be added to an inventory item's record.



**Figure 4.3.4-13. ILM-OEM Parts GUI**

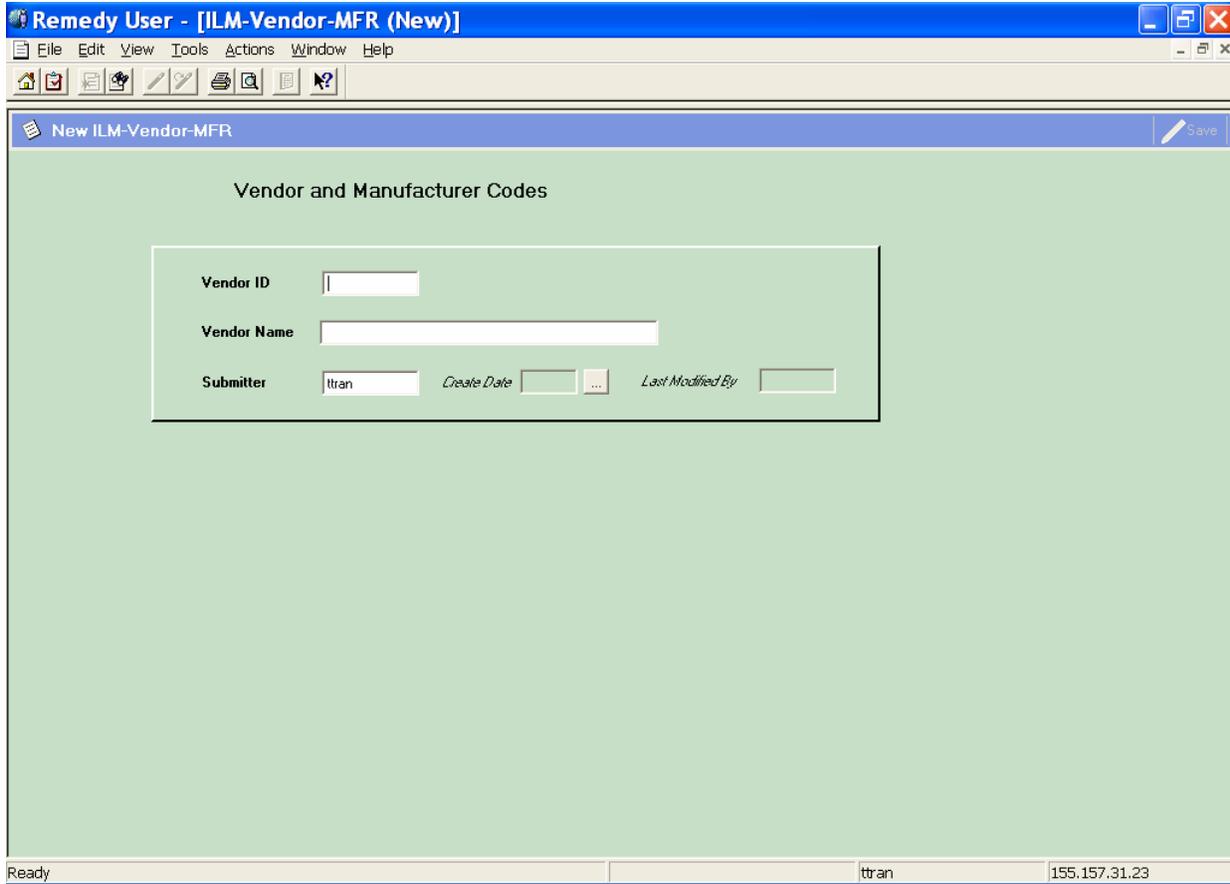
Table 4.3.4-7 provides the definitions for fields on the ILM-OEM Parts form.

**Table 4.3.4-7. ILM-OEM Parts Form Fields Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
Part No	Char	34	required	Manufacturer's or vendor's part number for an item.
MFR	Char	6	required	Code for the manufacturer of the item.
Hw-Sw Code	Char	2	optional	Code for classifying items according to source of maintenance costs.
Mod-Ver	Char	24	optional	Model or version of the item.
Description	Char	60	required	Manufacturer's or vendor's description of the item.
Create Date	Date		system-supplied	Date the record was created.
Submitter	Char	30	system-supplied	The user who created the record.
Last Modified By	Char	30	system-supplied	User ID of the last person that modified the record.

#### 4.3.4.2.7 ILM-Vendor-MFR GUI

The ILM-Vendor-MFR form (Figure 4.3.4-14) enables operators to define valid vendor codes for use with EIN records. The operator enters the data or modifies the data in the fields for this form as required.



**Figure 4.3.4-14. ILM-Vendor-MFR GUI**

Table 4.3.4-8 describes the fields on the ILM-Vendor-MFR form.

**Table 4.3.4-8. ILM-Vendor-MFR Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Vendor ID	Char	6	required	Code for a vendor from whom items are purchased.
Vendor Name	Char	30	optional	Full name of a vendor from who items are purchased.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The user that last modified the record.

#### 4.3.4.2.8 ILM-HwSw Codes GUI

Operators use this form (Figure 4.3.4-15) to maintain a standard set of codes for distinguishing items according to source of maintenance costs. These codes are associated with EIN items and are essential for grouping inventory items for reporting and browsing.

**Figure 4.3.4-15. ILM-HwSw Codes GUI**

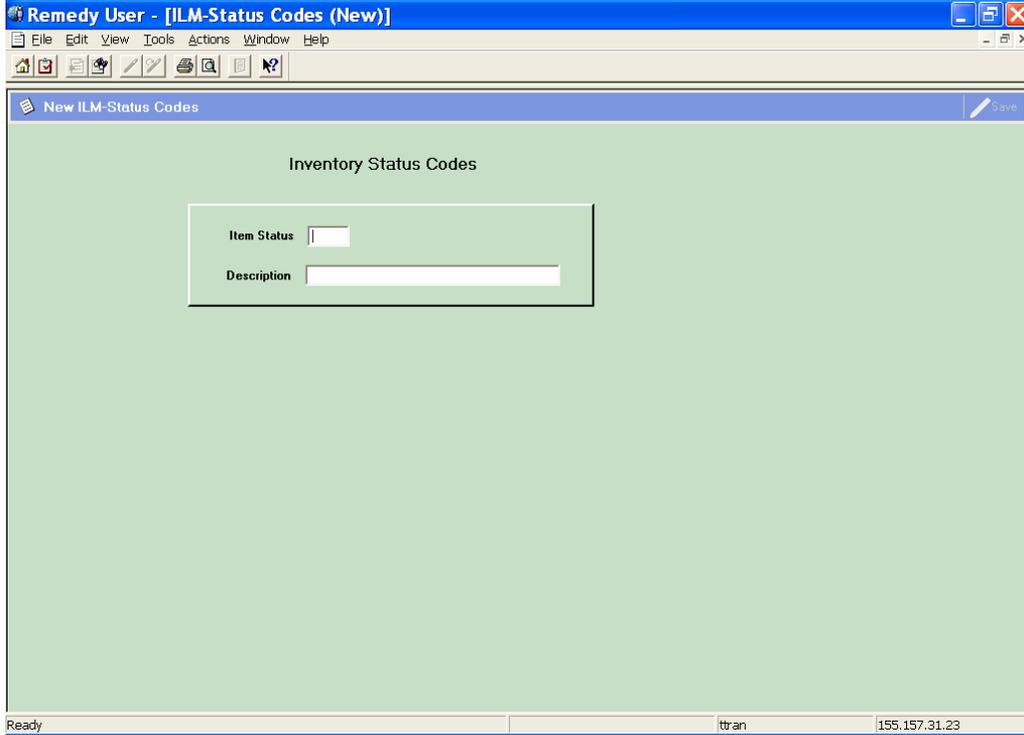
Table 4.3.4-9 describes the fields on the ILM-HwSw Codes form.

**Table 4.3.4-9. ILM-HwSw Codes Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Hw/Sw Code	Char	2	required	Code for classifying items according to source of maintenance costs.
Description	Char	30	required	Description for the Hardware/Software code.

**4.3.4.2.9 ILM-Status Codes GUI**

The ILM-Status Codes form (Figure 4.3.4-16) maintains a set of standardized codes for identifying valid inventory item states in the inventory and logistics life cycle.



**Figure 4.3.4-16. ILM-Status Codes GUI**

Table 4.3.4-10 describes the fields on the ILM-Status Codes form.

**Table 4.3.4-10. ILM-Status Codes Form Fields Descriptions**

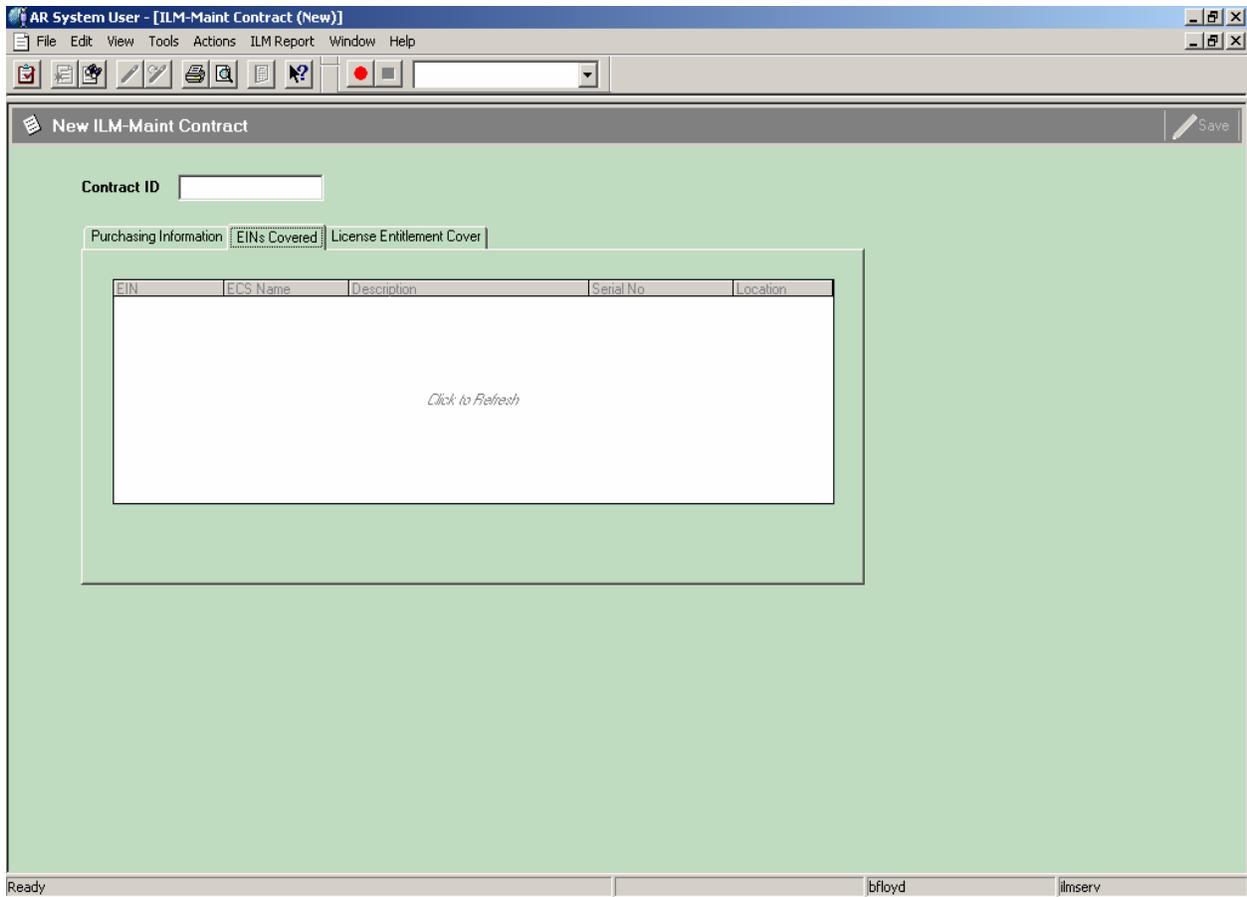
Field Name	Data Type	Size	Entry	Description
Item Status	Char	6	required	Code for an inventory status for an item.
Description	Char	30	required	Description for the code.

#### 4.3.4.2.10. ILM-Maint Contract GUI

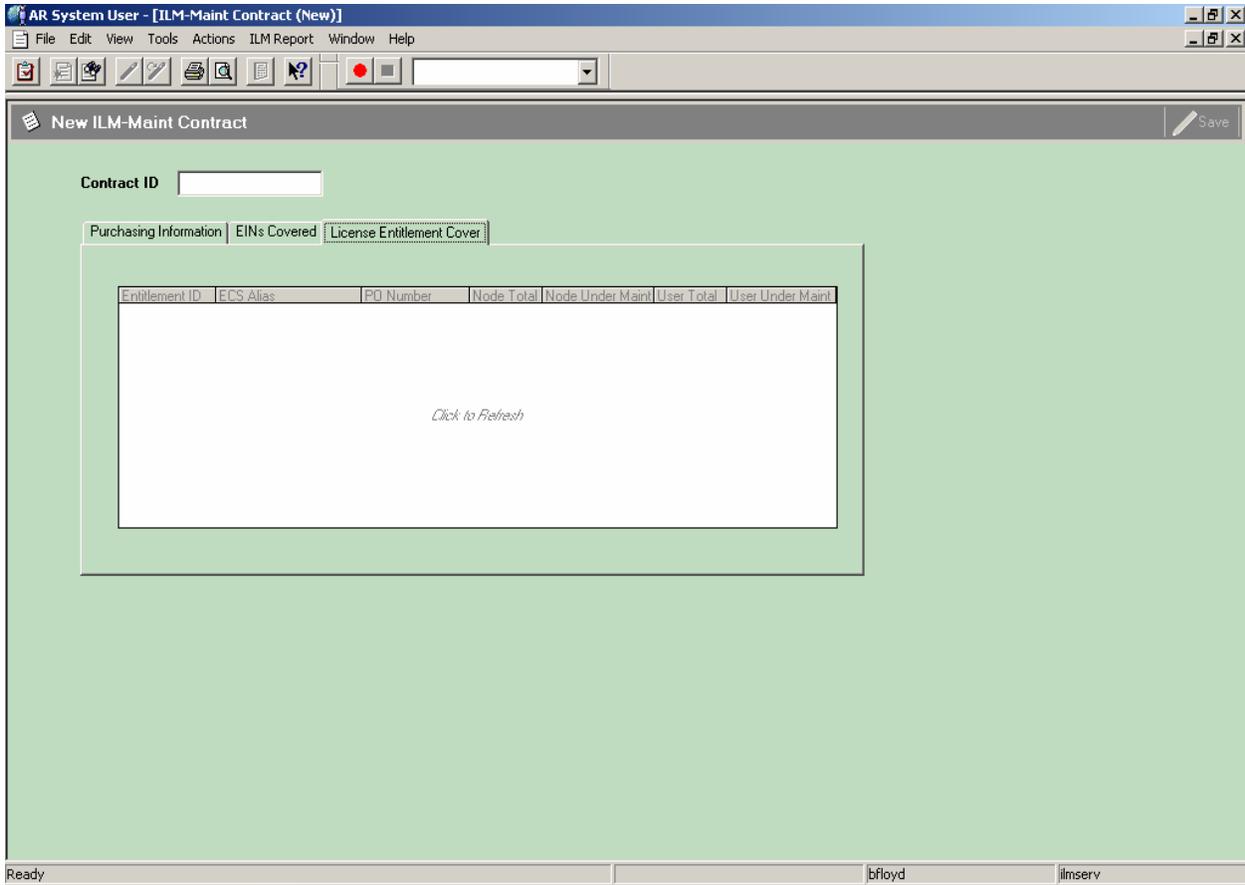
The ILM-Maint Contract form (Figure 4.3.4-17) provides the ability to track information about maintenance contracts with vendors and suppliers. The contract ID is the key field and should be the actual number that the purchasing agent or the vendor assigns. The data entered here supports data entry for the ILM-EIN form (Section 4.3.4.2.2). This form contains two tabs: Purchasing Information and EINs Covered. Purchasing Information contains fields pertaining to the maintenance purchase order. The EINs Covered tab displays a list of EINs the maintenance contract covers. (See Figures 4.3.4-18 and 4.3.4-19).

The screenshot shows a web browser window titled "Remedy User - [ILM-Maint Contract (Search)]". The browser's address bar and menu bar are visible. The main content area is a web form titled "Search ILM-Maint Contract". The form has a search bar at the top right with a "Search" button and a "Advanced" link. Below the search bar is a "Contract ID" input field. The form is divided into three tabs: "Purchasing Information", "EINs Covered", and "License Entitlement Cover". The "Purchasing Information" tab is active. It contains several input fields: "PD Number", "Vendor ID" (a dropdown menu), "Maint Vendor ID" (a dropdown menu), "Start Date" (a date picker), "Expiration Date" (a date picker), "Type of Support" (a text input field), "Comment" (a text input field), "Submitter" (a text input field), "Create Date" (a date picker), and "Last Modified By" (a text input field). The status bar at the bottom of the browser window shows "Ready", "ltran", and "155.157.31.23".

Figure 4.3.4-17. ILM-Maint Contract GUI (1 of 3)



**Figure 4.3.4-18. ILM-Maint Contract GUI (2 of 3)**



**Figure 4.3.4-19. ILM-Maint Contract GUI (3 of 3)**

Table 4.3.4-11 provides definitions for fields on the ILM-Maint Contract form.

**Table 4.3.4-11. ILM-Maint Contract Form Fields Descriptions (1 of 2)**

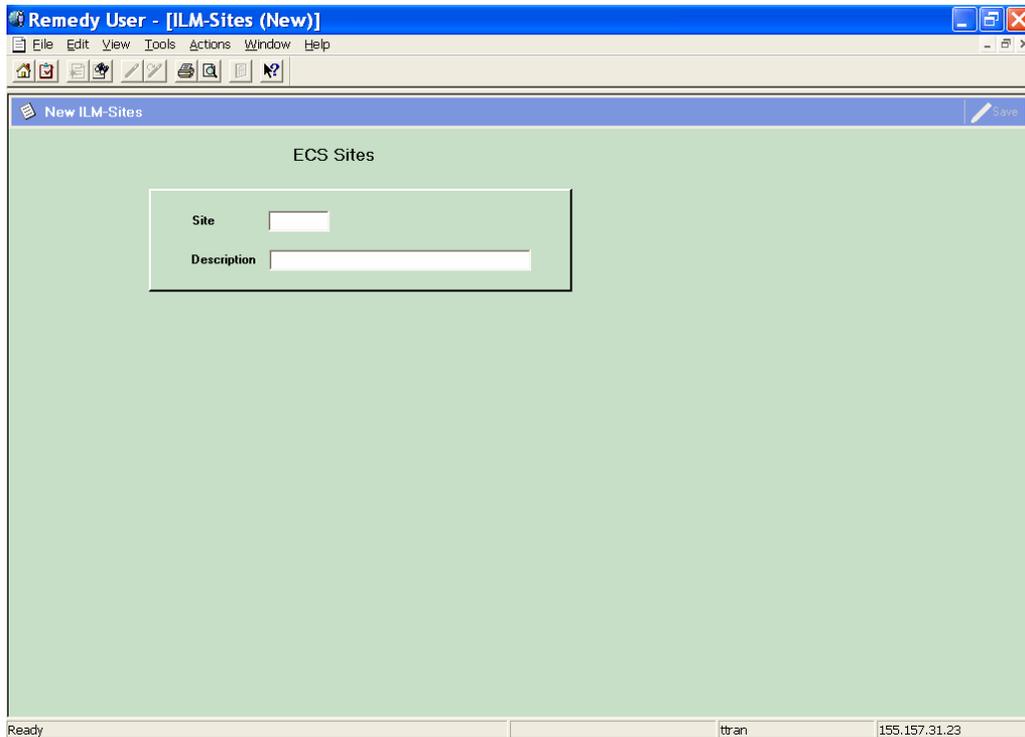
Field Name	Data Type	Size	Entry	Description
Contract ID	Char	10	Required	Identifier for the maintenance contract as assigned by purchasing or provided by the vendor
PO Number	Char	10	Required	Purchase order number of the purchase order that procured the maintenance coverage.
Vendor ID	Char	6	Optional	Code for the vendor with whom the contract is placed.
Maint Vendor ID	Char	6	Optional	Code for the vendor whom will provide the services
Start Date	Date		Optional	Date the contract is to become effective
Expiration Date	Date		Required	Date the contract will expire

**Table 4.3.4-11. ILM-Maint Contract Form Fields Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Type of Support	Char	60	Optional	Type of support procured.
Comment	Char	60	Optional	Miscellaneous information specific to the maintenance contract
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.
EINs Covered	Page		system-supplied	Page for displaying the EINs covered under the maintenance contract
License Entitlement Cover	Page		System-supplied	Page for displaying the license entitlements covered under the maintenance contract.

#### 4.3.4.2.11. ILM-Sites GUI

This form (Figure 4.3.4-20) allows operators to maintain a set of valid standard codes and descriptions for identifying ECS sites. Each code represents one site.



**Figure 4.3.4-20. ILM-Sites GUI**

Table 4.3.4-12 describes the fields on the ILM-Sites form.

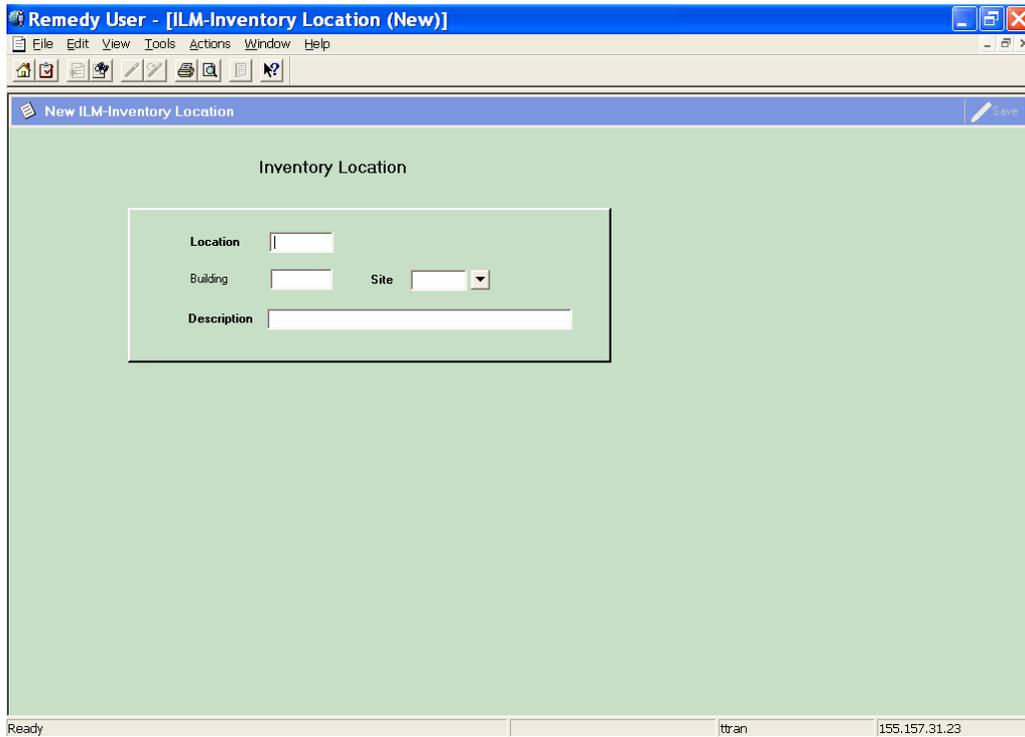
**Table 4.3.4-12. ILM-Sites Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Site	Char	6	Required	Code for an ECS site.
Description	Char	40	optional	Description of the Site.

#### 4.3.4.2.12. ILM-Inventory Location GUI

The form shown in Figure 4.3.4-21 is used to maintain information about ECS inventory locations. This standardized information is available to other screens and reports, which can access it by reference to a location.

**Note:** An important distinction is made in Remedy between an ECS site and an inventory location. Sites are officially designated by NASA and generally include the SMC, DAACs, and other official support installations. ECS Property Administrators designate inventory locations for purposes of property management. They are typically facilities or locales where inventory items are stored or installed and there can be more than one inventory location at a site. Inventory locations are sometimes assigned the same names and codes as a site, but Remedy treats the two as different entities.



**Figure 4.3.4-21. ILM-Inventory Location GUI**

Table 4.3.4-13 describes the fields on the ILM-Inventory Location form

**Table 4.3.4-13. ILM-Inventory Location Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Location	Char	6	required	Identifier for the inventory location where material can be found.
Building	Char	6	optional	Building where the inventory items can be found.
Site	Char	6	required	Code for the ECS site hosting the inventory location.
Description	Char	30	required	Description for the location id.

### 4.3.4.3 Maintenance Management

Maintenance Work Orders (MWOs) are the heart of Remedy's Maintenance Management functionality. They are used for collecting downtime information against equipment subject to Reliability, Maintainability, and Availability (RMA) reporting as well as to identify equipment that has failed and/or been replaced during system maintenance. By way of a special feature available to the ILM-MWO and the ILM-MWO Line Item forms, operators can have the system update property records automatically based on the maintenance activities a work order describes. The following sections will describe the maintenance work order forms.

#### 4.3.4.3.1 ILM-MWO GUI

The ILM-MWO form (Figures 4.3.4-22 to 4.3.4-25) provides the ability to create and update maintenance work orders as maintenance activity proceeds and as additional information about the repair becomes known. It also has a special feature that updates property records on demand based on events and data described in a work order's line items (ILM-MWO Line Item Form).

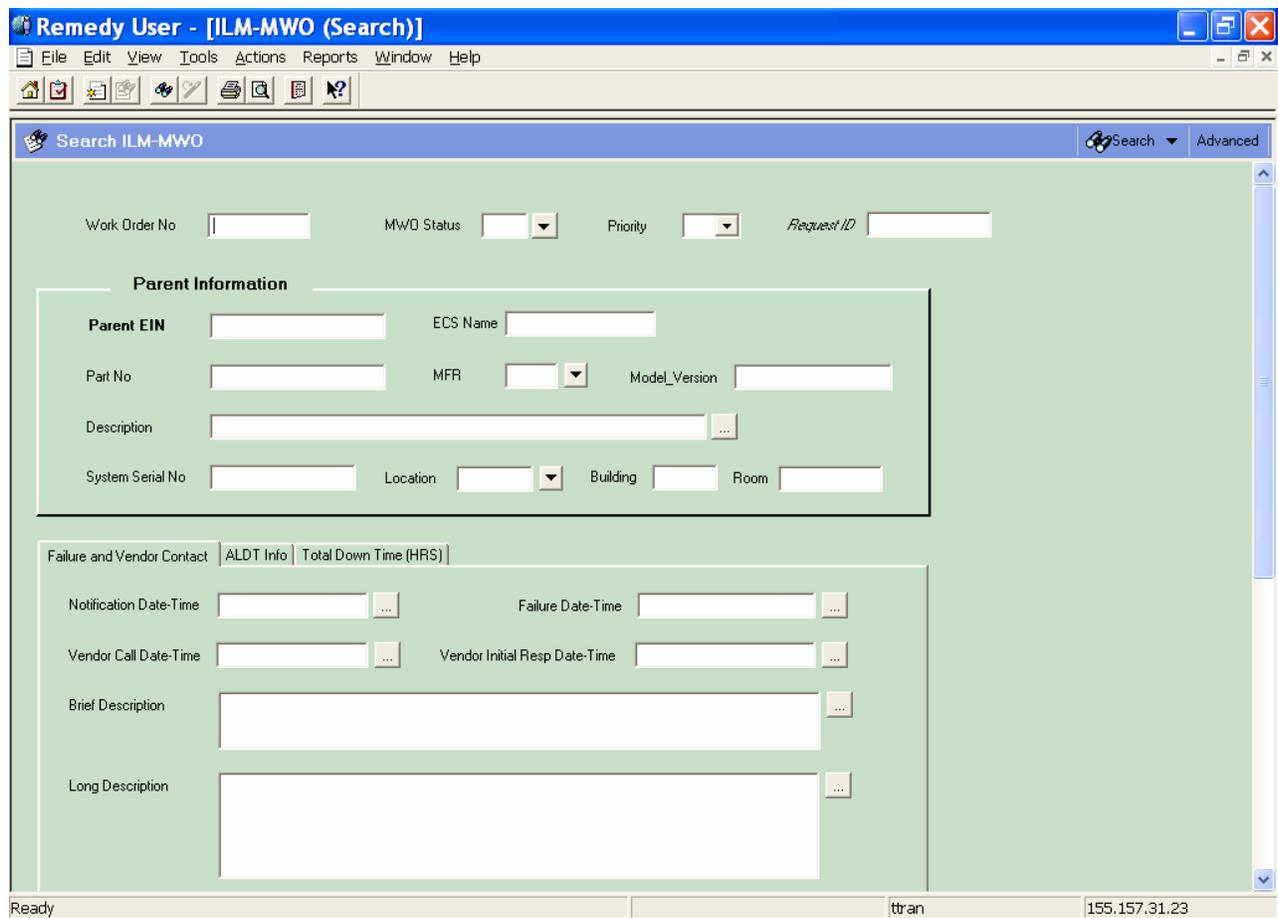
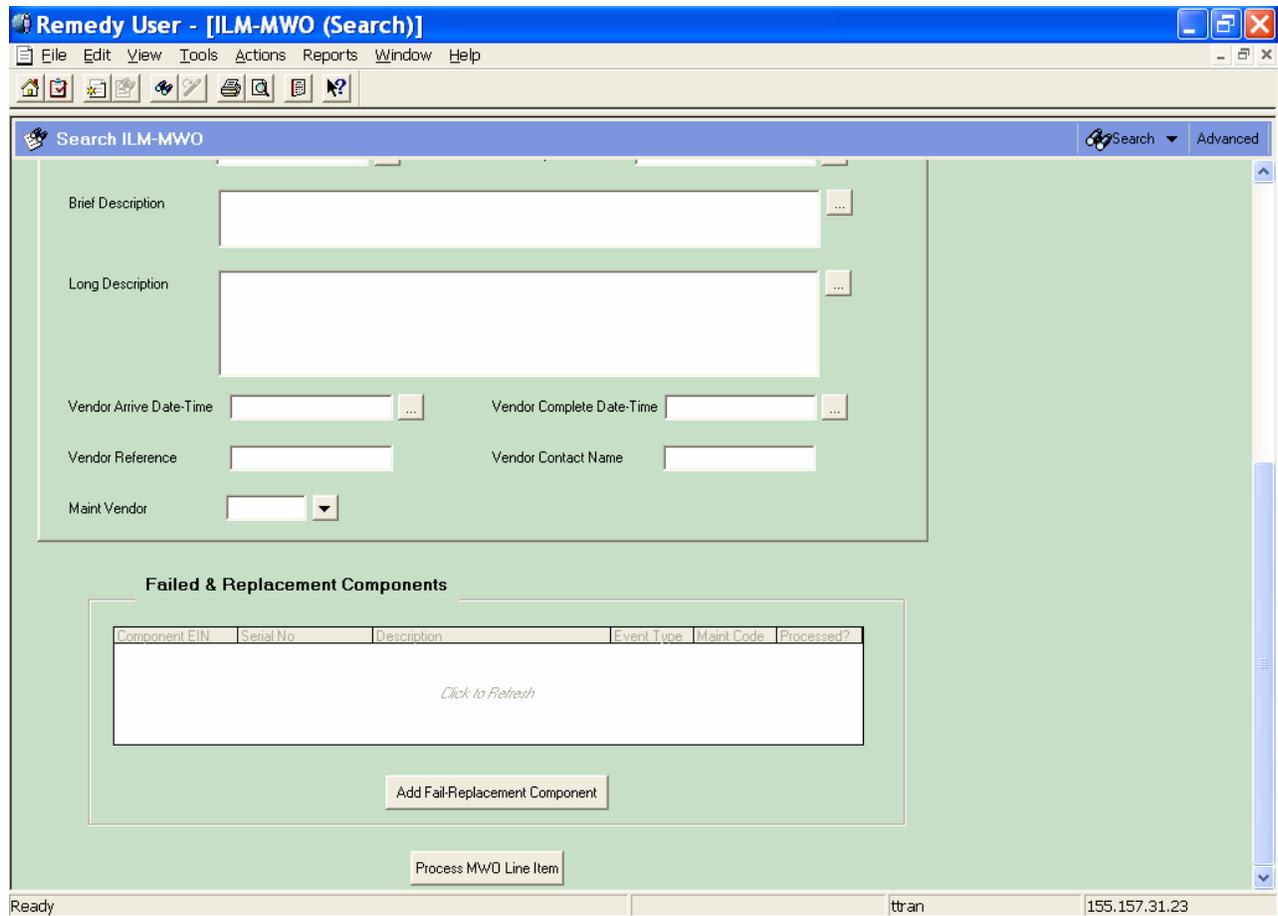


Figure 4.3.4-22. ILM-MWO GUI (1 of 4)



**Figure 4.3.4-23. ILM-MWO Failure and Vendor Contact Tab (2 of 4)**

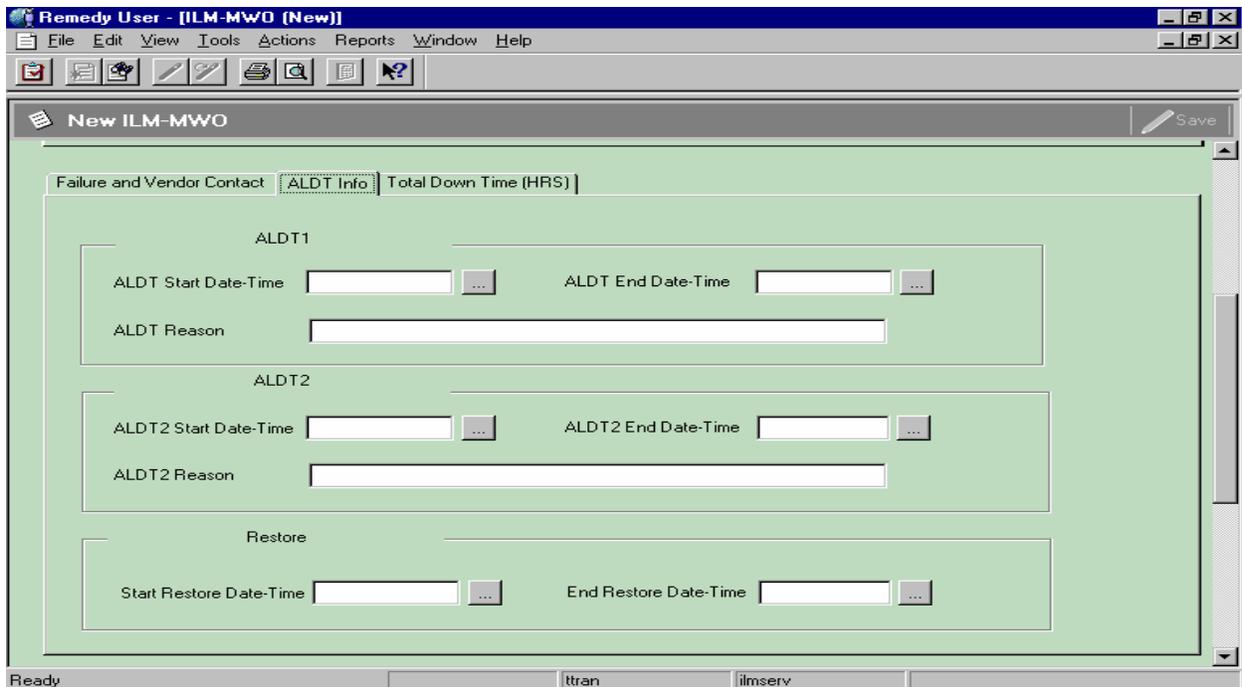


Figure 4.3.4-24. ILM-MWO ALDT Info Tab (3 of 4)

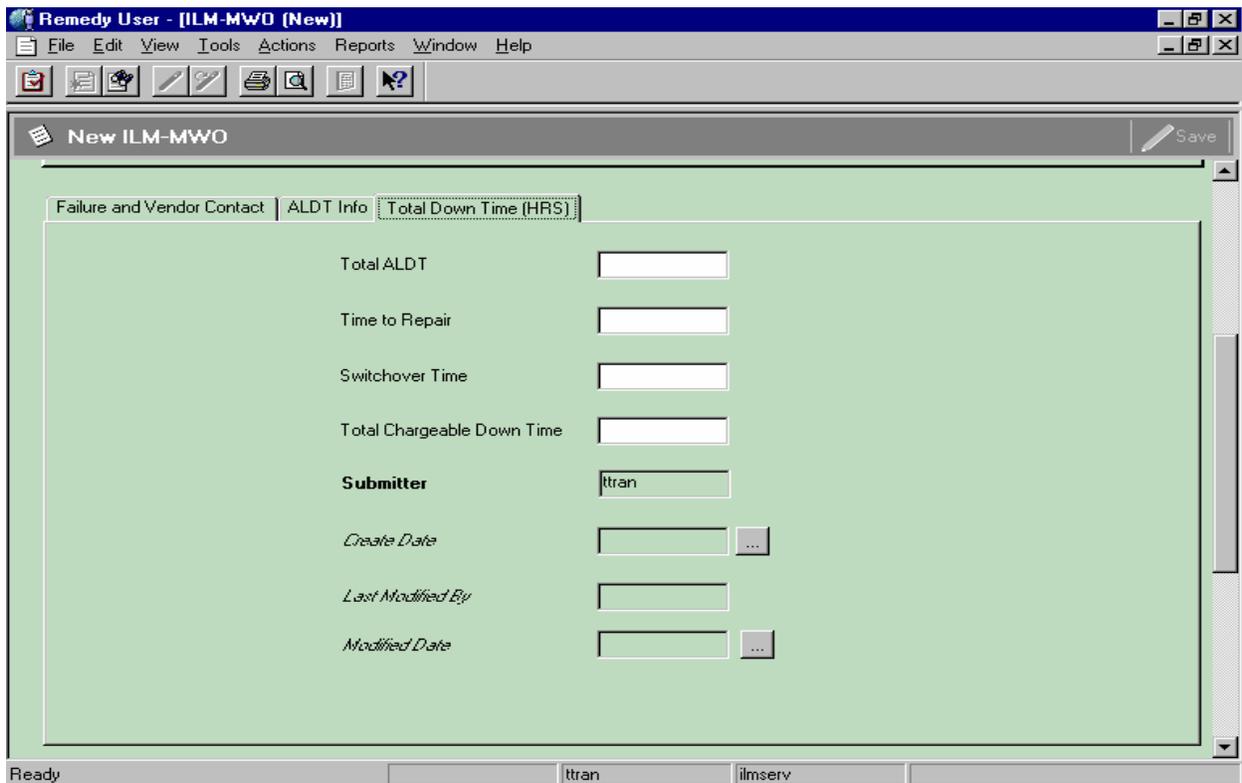


Figure 4.3.4-25. ILM-MWO Total Down Time Tab (4 of 4)

Table 4.3.4-14 describes the fields on the ILM-MWO Form.

**Table 4.3.4-14. ILM-MWO Form Fields Descriptions (1 of 3)**

Field Name	Data Type	Size	Entry	Description
Work Order No	Char	10	system-supplied	Identifier for the work order.
MWO Status	Char	1	optional; O, A, F, or R	Code for the status of the work order. O = Open; A = Audit; F=Finish; R = Retired.
Priority	Char	1	optional	Code for the priority assigned to the work.
Request ID	Char	15	System-supplied	Provides and displays the record identifier.
Parent EIN	Char	20	optional	EIN for the parent item in an EIN structure.
ECS Name	Char	30	system-supplied from EIN record	Name of the machine with which the item is associated.
Part No	Char	34	system-supplied from EIN record	Manufacturer's part number for the item entered as Parent EIN.
MFR	Char	6	optional	Code for the manufacturer of the item.
Model_Version	Char	24	optional	Manufacturer model number or version number for the item.
Description	Char	60	system-supplied from EIN record	Manufacturer's description for the item entered as Parent EIN.
System Serial Number	Char	30	system-supplied	Serial number of the item entered as Parent EIN.
Location	Char	8	system-supplied from EIN record	Designator for the location where the item entered as Parent EIN is situated.
Building	Char	6	optional	Building where the item will be found.
Room	Char	6	system-supplied from EIN record	Room in which the item entered as Parent EIN is situated.
Notification Date-Time	Date-Time		optional	The date and time problem was reported. This field is initialized with the current date and time but can be modified.
Failure Date-Time	Date-Time		optional	Date and time that the failure occurred.
Vendor Call Date-Time	Date-Time		optional	The date and time the maintenance vendor was called.
Vendor Initial Resp Date-Time	Date-Time		Optional	Indicate the vendor initial response date and time to the service call.
Brief Description	Char	140	Optional	A brief description of the problem and resolution
Long Description	Char	1024	optional	A long description of the problem and resolution relevant to the maintenance event

**Table 4.3.4-14. ILM-MWO Form Fields Descriptions (2 of 3)**

Field Name	Data Type	Size	Entry	Description
Vendor Arrive Date-Time	Date-Time		optional	The date and time the maintenance vendor actually arrived to perform the repairs.
Vendor Complete Date-Time	Date-Time		optional	Date and time the repair was completed.
Vendor Reference	Char	20	optional	Operator has option to enter any information in reference to the vendor.
Vendor Contact Name	Char	30	optional	Vendor point of contact.
Maint Vendor	Char	6	optional	Code for the vendor that provides maintenance support for this item.
ALDT Start Date-Time	Date-Time		optional	The date and time a delay in repairing the system began.
ALDT End Date-Time	Date-Time		optional	The date and time a delay in repairing the system ended.
ALDT Reason	Char	60	optional	A code for the reason a delay was encountered.
ALDT2 Start Date-Time	Date-Time		optional	The second delay date and time for when the vendor's work was suspended and resumed (including travel time, admin delays, and logistics delays).
ALDT2 End Date-Time	Date-Time		optional	The second ending date and time for the delay.
ALDT2 Reason	Char	60	optional	The reason for the second delay.
Start Restore Date-Time	Date-Time		optional	The date and time when start restoring the failed system.
End Restore Date-Time	Date-Time		optional	The date and time end restoring the system.
Total ALDT	Real	5.2	optional	Total Administrative logistic delay time (ALDT) Specified in hours.
Time To Repair	Real	5.2	optional	Time required to effect the repair. Specified in hours.
Switchover Time	Real	5.2	optional	Time required for system switch-over. Specified in hours.
Total Chargeable Down Time	Real	5.2	optional	Time to be charged for downtime. Specified in hours.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.

**Table 4.3.4-14. ILM-MWO Form Fields Descriptions (3 of 3)**

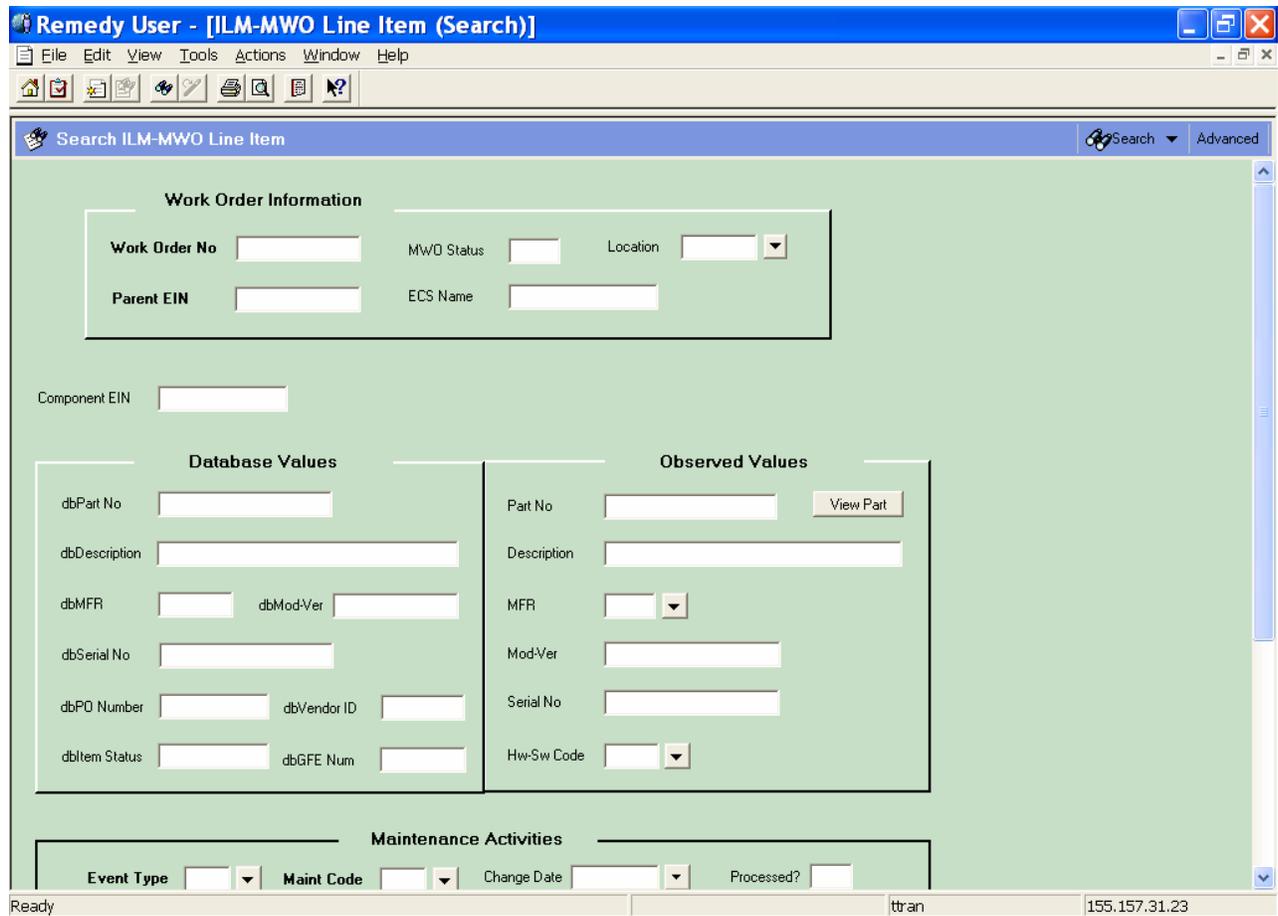
Field Name	Data Type	Size	Entry	Description
Modified Date	Date		system-supplied	The last date the record was modified.
Failed & Replacement Components	Table field		System-supplied	Field for displaying the failed and replacement components.

The following buttons/functions are unique to the ILM-MWO form:

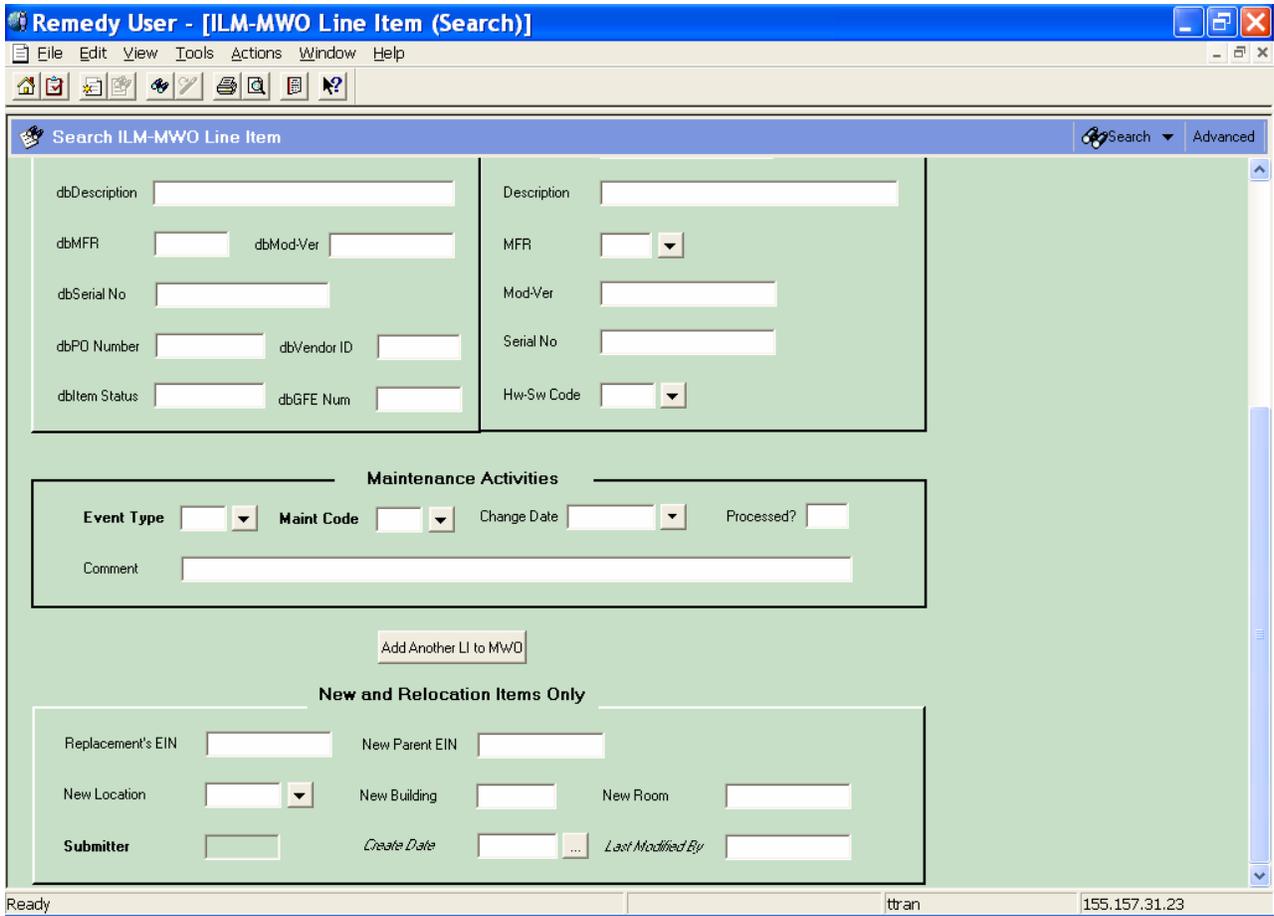
- Add Fail/Replacement Component - provides access to the ILM-MWO Line Item Form (figure 4.3.4-27) for adding or accessing data about components involved in individual maintenance actions.
- Process MWO Line Item - The Process MWO Line Item button provides a convenient, reliable, and efficient means for updating ILM property records based on information contained in ILM-MWO line item form. New EIN records are created as necessary, as are corresponding Part No and EIN structure records. Processing adds new items to the ECS inventory, archives those that have failed or been returned to the vendor, and re-assigns any that have been relocated or returned to stock. Additionally, items returned to a vendor are rendered obsolete with respect to their parent EINs and, of those that had failed, costs are transferred to their replacements. If Remedy is to update property records based on ILM-MWO line item data, line item records must specify values for Event Type and Maint Code. They determine the type of property record changes to be made. (See Table 4.3.4-15) Additionally, operators must supply a value for New Parent EIN if an item is designated for relocation. Other line item fields, such as Component EIN, Change Date, Replacement's EIN, New Location, and New Room, have special significance as well in that they influence which database records actually change.

#### **4.3.4.3.2 ILM-MWO Line Item GUI**

The ILM-MWO Line Item form (Figures 4.3.4-27 – 4.3.4-28) provides the ability for the Local Maintenance Coordinator to identify equipment that has failed and/or been replaced during system maintenance. In general, a line item would be created for each EIN component that has failed, been replaced, or been added new. Line items can be created even if an EIN record does not exist for the component, and operators can record observed details about a repair item even if the details conflict with what is currently contained in the EIN record for the item. This form has two sections the “Database Values” and the “Observed Values”. The “Database Values” displays the database value of the component EIN record if the Component EIN exists in the database. Operator may not update the fields listed in the “Database Values” section. However, the operator may update the Component EIN record in the “Observed Values” section to reflect the actual data of the Component EIN.



**Figure 4.3.4-27. ILM-MWO Line Item GUI (1 of 2)**



**Figure 4.3.4-28. ILM-MWO Line Item GUI (2 of 2)**

Table 4.3.4-15 describes the fields on the ILM-MWO Line Item form.

**Table 4.3.4-15. ILM-MWO Line Item Form Fields Descriptions (1 of 3)**

Field Name	Data Type	Size	Entry	Description
Work Order No	Char	10	system-supplied	Identifier for the work order.
MWO Status	Char	1	system-supplied	Code for the status of the work order. O = Open; A = Audit; F=Finish; R = Retired.
Location	Char	6	system-supplied	Location of the Parent EIN.
Parent EIN	Char	20	system-supplied	EIN for the parent item in an EIN structure.
ECS Name	Char	30	System-supplied	Name of the machine with which the item is associated.

**Table 4.3.4-15. ILM-MWO Line Item Form Fields Descriptions (2 of 3)**

Field Name	Data Type	Size	Entry	Description
Component EIN	Char	20	optional	Identifier for an item that is a child (component) of a parent EIN and the target of the maintenance event. If the field is left null or blank, the system will create an inventory number with a C-prefix for it automatically when the line item is processed.
Database Values Section fields			system-supplied	If the entered Component EIN record exists in the ILM-EIN form, the system will populate the fields in this section with the data derived from the ILM-EIN form record.
Observed Values Section fields				User may enter information that describes the Component EIN in this section. If the Component EIN does not exist in the database, the component EIN will be added to the database using the information provided in the fields in the Observed Values section.
Part No	Char	34	optional	Manufacturer's or vendor's part number for the item.
Description	Char	60	optional	Manufacturer's or vendor's description of the item. The operator may zoom to the OEM Parts table to choose a description, if it had been entered there previously (see the OEM Parts section).
MFR	Char	6	optional	Code used for the manufacturer of the item. The operator may zoom to the Vendor table to choose a code, if it had been entered there previously (see the Vendor Master section).
Mod-Ver	Char	24	optional	Model or Version of the item.
Serial No	Char	30	optional	Serial number of the item.
Hw-Sw Code	Char	2	Optional	Code for classifying items according to source of inventory
Event Type	Char	1	required	Code identifying a type of maintenance event (N=new item installed; F=failed item replaced; R=serviceable item replaced).
Maint Code	Char	1	required	Code designating the item's disposition. Property records are updated differently depending on the value entered. (R = Relocate, S = Stock, V = Vendor).
Change Date	Date		required	Effective date of the configuration change.
Processed?	Char	1	system supplied	Flag signifying whether or not the line item has been processed by the Work Order's .P(rocess_Changes) bottom-line command. The command updates the Component EIN's property records.
Comment	Char	60	Optional	Miscellaneous information specific to the item

**Table 4.3.4-15. ILM-MWO Line Item Form Fields Descriptions (3 of 3)**

Field Name	Data Type	Size	Entry	Description
Replacement's EIN	Char	20	Optional	Identifier of the new item being used as a replacement. This field is used only for items that have failed or that are being replaced (i.e., Event Type="F", or Event Type="R").
New Parent EIN	Char	20	Optional	EIN of the item to which the Component EIN is to be re-assigned. This field is applicable only to components that have failed or are being replaced (Event Type="F" or "R"), and are being relocated (Maint Code="R"). <i>The value must be supplied or the item will not get processed.</i>
New Location	Char	6	optional	Code for the new inventory location to which the item is to be assigned. This field is used for items that have failed or are being replaced (i.e., Event Type="R") and are being returned to stock.
New Building	Char	6	optional	Building where the item is to be installed.
New Room	Char	15	optional	Room where the item is to be installed.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.

The following buttons are unique to this form:

- View Part – displays the record of the Part No. if it exists in the database.
- Add Another LI to MWO – brings up the MWO Line Item form to facilitate another line item record entry.

Table 4.3.4-16 lists the appropriate combinations of event types and maintenance codes and their effects on property records when processed.

**Table 4.3.4-16. Effects on Property Records by  
MWO Line Item Processing (1 of 4)**

Event Type	Maint Code	Property Record Updates
F (Failed)	S (Stock)	<p>Situation: an item has failed and has been returned to stock.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Clears its Parent EIN</li> <li>• Clears its installation date</li> <li>• Sets Item status to "F"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to "IN STOCK"</li> <li>• Sets location, building, and room to new values.</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structures where it is active. The structure is rendered inactive as of the specified Change Date</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MFS" for the specified component</li> </ul>
F (Failed)	V (Vendor)	<p>Situation: an item has failed and has been returned to the vendor.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• If the Component EIN field is blank, the system will not process the record and sets the Process field to "X."</li> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Clears its Parent EIN</li> <li>• Clears its installation date</li> <li>• Sets item status to "X"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to "ARCHIVE"</li> <li>• Sets location to "EDFARC" and clears the building and room values.</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structures where it is active. The structure is rendered inactive as of the specified Change Date</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MFV" for the specified component</li> </ul>

**Table 4.3.4-16. Effects on Property Records by  
MWO Line Item Processing (2 of 4)**

Event Type	Maint Code	Property Record Updates
<p align="center">N (New)</p>	<p align="center">S (Stock)</p>	<p>Situation: the replacement item is new and is taken from stock.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Sets the Parent EIN to the MWO's Parent EIN</li> <li>• Sets installation date to the Change Date</li> <li>• Sets item status to "I"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to that of the Parent EIN specified for the MWO itself</li> <li>• Sets location and room values to that of the Parent EIN specified for the MWO</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structures where it is active, if any. The structure is rendered inactive as of the specified Change Date</li> <li>• Adds the EIN as a component of the item specified as a component of the MWO's Parent EIN. The structure is rendered active as of the Change Date specified</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MNS" for the specified component</li> </ul>

**Table 4.3.4-16. Effects on Property Records by  
MWO Line Item Processing (3 of 4)**

Event Type	Maint Code	Property Record Updates
<p align="center">N (New)</p>	<p align="center">V (Vendor)</p>	<p>Situation: the replacement item is new and came from the vendor.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Sets the Parent EIN to the MWO's Parent EIN</li> <li>• Sets installation date to the Change Date</li> <li>• Sets receive date to the Change Date</li> <li>• Sets item status to "I"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to that of the Parent EIN specified for the MWO itself</li> <li>• Sets location, building, and room values to that of the Parent EIN specified for the MWO itself</li> <li>• If the component is replacing an EIN specified in a separate line item as a failed item being returned to the vendor and copies the item cost from the EIN record for the failed item to the EIN record for the new item</li> </ul> </li> <li>• For a failed item being replaced by the specified component EIN: <ul style="list-style-type: none"> <li>• Sets cost to 0</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structures where it is active, if any. The structure is rendered inactive as of the specified Change Date</li> <li>• Adds the EIN as a component of the item specified as a component of the MWO's Parent EIN. The structure is rendered active as of the Change Date specified</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MNV" for the specified component</li> </ul>

**Table 4.3.4-16. Effects on Property Records by  
MWO Line Item Processing (4 of 4)**

Event Type	Maint Code	Property Record Updates
R (Replaced)	R (Relocate)	<p>Situation: an item is being relocated to a new machine.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Sets the Parent EIN to the New Parent EIN</li> <li>• Sets the Installation Date to Change Date</li> <li>• Sets item status to "I"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to the name of the new parent EIN</li> <li>• Sets location, building, and room to that of the new parent EIN</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structures where it is active. The structure is rendered inactive as of the specified Change Date</li> <li>• Adds the EIN as a component of the item specified as New Parent EIN. The structure is rendered active as of the specified Change Date</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MRR" for the specified component</li> </ul>
R (Replaced)	S (Stock)	<p>Situation: an item is being returned to stock.</p> <p>EIN records:</p> <ul style="list-style-type: none"> <li>• Creates a record if one doesn't exist for the specified component EIN</li> <li>• For the specified component EIN: <ul style="list-style-type: none"> <li>• Sets the Parent EIN to blank</li> <li>• Clears its installation date</li> <li>• Sets item status to "R"</li> <li>• Sets audit date to the Change Date</li> <li>• Sets ECS name to "IN STOCK"</li> <li>• Sets location, building, and room to new values, if specified</li> </ul> </li> </ul> <p>OEM part records:</p> <ul style="list-style-type: none"> <li>• Creates an OEM Part record if "observed values" for Part No, MFR, and Description are specified and the part record doesn't already exist</li> </ul> <p>EIN structure records:</p> <ul style="list-style-type: none"> <li>• Obsoletes the specified component EIN in EIN Structure where it is active. The structure is rendered inactive as of the specified Change Date</li> <li>•</li> </ul> <p>Inventory transaction records:</p> <ul style="list-style-type: none"> <li>• Creates an entry for event of type "MRS" for the specified component</li> </ul>

#### **4.3.4.4 License Management**

Many software products used in EMD are licensed; that is, subject to conditions of limiting how many users can run the product and where. Licenses take numerous forms. Nodelock licenses let users run the product, but only on a designated machine; counted nodelock licenses limit the number of users that can run the product on that machine. Floating licenses allow users to run a product from any machine in a network. They may limit the number of users that can run the product concurrently, the number of servers that can be used concurrently, the number of sites that can use the product, or any combination of the above. Licenses can apply to a named product, one or more of its features, one or more of its versions, and/or one or more types of platforms. Some vendors enforce these provisions through use of license keys, but ECS is accountable for adhering to licensing provisions whether vendors use keys or not.

The life cycle for licensed COTS software encompasses developmental and systems engineering, purchasing, receiving, stocking, distribution, installation, use, and recovery. Licenses associated with COTS products are obtained and allocated; they also expire. Licenses do not always change when the licensed product does.

When purchasing a product or obtaining an upgrade, engineering determines what licensing provisions are required. Depending on the product, license entitlements may appear as separate line items on purchase orders, but often not. (For example, purchased licensing provisions may be provided with the product; that is, not purchased separately.) License certificates (rights to certify) typically accompany software when it arrives and, in the case of operating system software, accompanies the computers themselves. These certificates describe the licensing provisions that were purchased and may carry an associated cost. Sometimes, the certificates include a license key, but usually they represent the right to obtain keys.

Multiple licenses are sometimes obtained from the product vendor under the provisions of a single license certificate. Each license would account for part of the rights-to-use under the certificate. Conversely, individual licenses can consume rights-to-use from more than one certificate. Each unique license key implies a unique license, but not every license has a key.

Licenses are allocated to the sites and host machines where their keys are installed, and keyless licenses are allocated to where their software products are installed. This is not so much for property accounting (i.e., cost accounting), but to verify adherence to purchased licensing provisions and to identify where licenses are used in case rights-to-use must transfer elsewhere. A single license can be allocated to multiple sites and machines, although it's unclear at present whether a machine's current location determines the license's allocation site.

License rights-to-use are counted differently depending on the type of licenses purchased. Rights for nodelock license are allocated and counted by node and are consumed at the rate of one license per node. Floating license rights are allocated and counted based on number of users on a network rather than by specific machines, where the network is represented by a machine on which the license is installed. Floating license rights are consumed at the rate of number of users per license. Occasionally, a purchased entitlement covers a total number of users across a limited number of machines. In this case, rights are consumed at the rate of one license per node as well as number of users per license.

The following forms provide the SLA capabilities to manage software licenses.

- ILM-License Products – to maintain standardized information about manufacturer’s part numbers.
- ILM-License Entitlement – to maintain records of purchased rights-to-use for licensed software.
- ILM-License – to maintain records of software licenses obtained from vendors and maintains license allocation.
- ILM-License Mapping – manages the mapping of a license to purchased entitlements.
- ILM-Additional Host – identifies redundant or backup server machines on which the license will be installed

#### 4.3.4.4.1. ILM-License Product GUI

This form (Figure 4.3.4-29) provides the SLA the ability to maintain standardized information about manufacturers’ part numbers for software licenses. Licenses part numbers and associated information must be recorded before they can be added to an entitlement or license via the ILM-Entitlement form or the ILM-License form.

The screenshot displays a web browser window titled "Remedy User - [ILM-Licensed Products (New)]". The browser's address bar shows "New ILM-Licensed Products" and a "save" button. The main content area is titled "License Product Part Information" and contains a form with the following fields:

- Entitlement Part No:
- MFR:  (with a dropdown arrow)
- Version:
- Description:
- ECS Alias:
- License Type:  (with a dropdown arrow)
- Submitter:  (value: tran)
- Create Date:
- Last Modified By:

The status bar at the bottom of the browser window shows "Ready", "tran", and "155.157.31.23".

**Figure 4.3.4-29. ILM-License Products GUI**

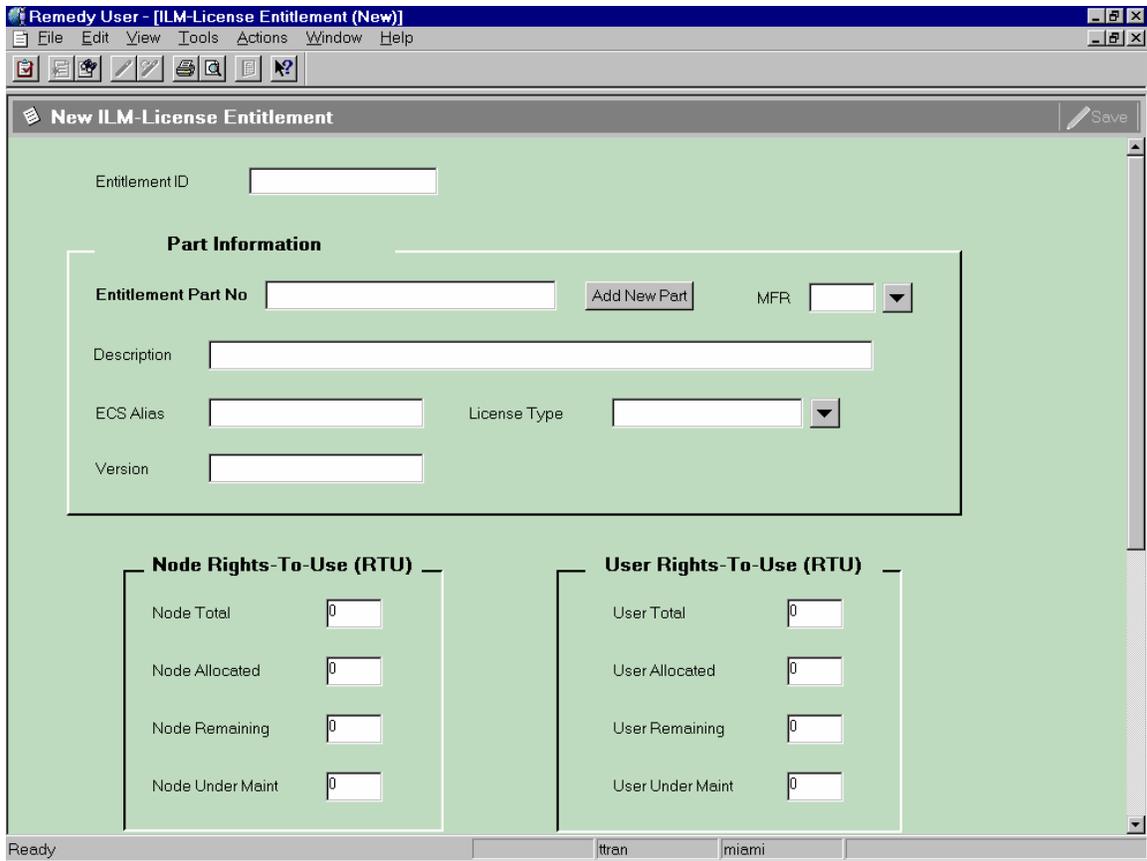
Table 4.3.4-17 describes the ILM-License Products form fields definitions.

**Table 4.3.4-17. ILM-Licensed Products Form Fields Descriptions**

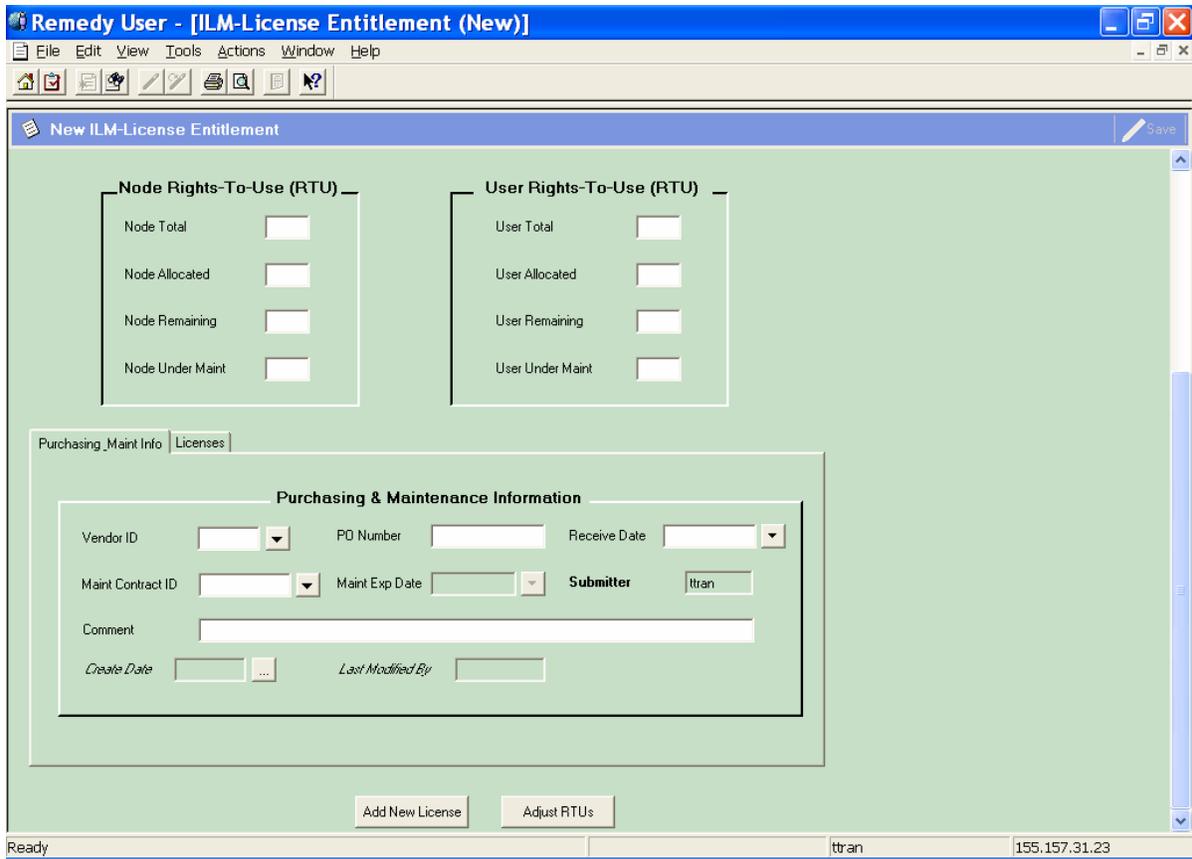
Field Name	Data Type	Size	Entry	Description
Entitlement Part No	Char	34	Required	Manufacturer's or vendor's part number for the entitlement.
MFR	Char	6	Required	Code for the manufacturer from whom the item was purchased.
Version	Char	34	Optional	Version number of the part.
Description	Char	50	Required	Manufacturer's or vendor's description for the entitlement. This field reflects the description of the OEM Part Number entered in the field above.
ECS Alias	Char	30	optional	Common name used in ECS for the licensed product and all its versions and variants.
License Type	Char	16	optional	Classification that distinguishes among licenses according to rules of use. Examples include: floating (limited number of concurrent users), nodelocked (limited to use on a single machine), user (limited to use by a certain individual), project (unlimited use anywhere by individuals working on a certain project), site (unlimited use at a single site), etc.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.

#### 4.3.4.4.2 ILM-License Entitlement Form

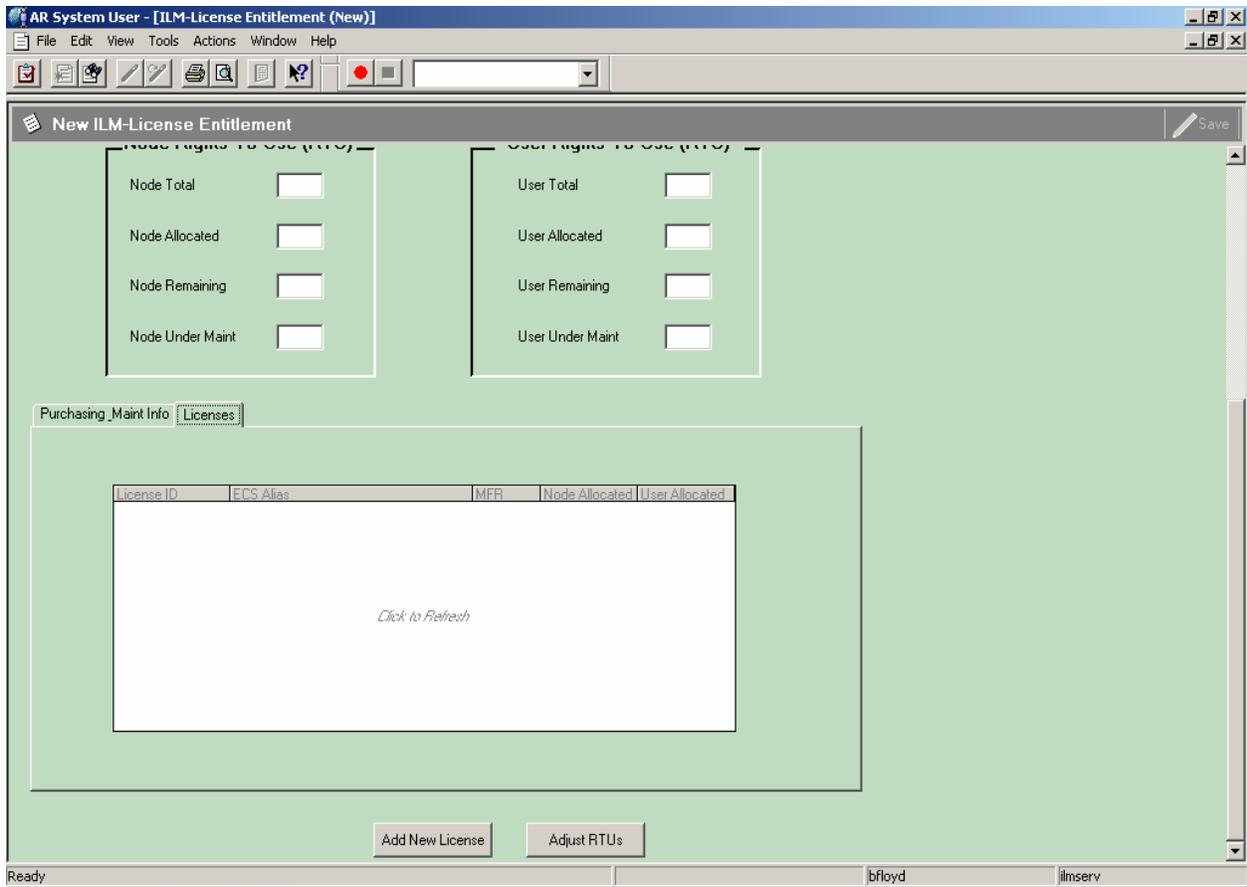
Operators use the ILM-License Entitlement form (Figure 4.3.4-30) to maintain records of purchased rights-to-use for licensed software, including how many node and user rights-to-use have been consumed, remain, and are under maintenance. Rights consumed and remaining are computed automatically based on the licenses mapped against it.



**Figure 4.3.4-30. ILM-License Entitlement GUI (1 of 3)**



**Figure 4.3.4-31. ILM-License Entitlement GUI (2 of 3)**



**Figure 4.3.4-32. ILM-License Entitlement GUI (3 of 3)**

Table 4.3.4-18 describes the ILM-License Entitlement form's field descriptions.

**Table 4.3.4-18. ILM-License Entitlement Form Fields Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
Entitlement ID	Char	10	System supplies	Identifier for a purchased license entitlement.
Entitlement Part No	Char	34	required	Manufacturer's or vendor's part number for the entitlement.
MFR	Char	6	system supplied	Code for the manufacturer from whom the item was purchased. This field reflects the MFR of the entitlement Part No entered in the field above.
Description	Char	50	system supplied	Manufacturer's or vendor's description for the entitlement. This field reflects the description of the entitlement Part No entered in the field above.
ECS Alias	Char	30	system supplied	Common name used in ECS for the licensed product and all its versions and variants. This field reflects the ECS Alias of the entitlement Part No entered in the field above.
License Type	Char	16	system supplied	Classification that distinguishes among licenses according to rules of use. This field reflects the license type of the entitlement Part No entered in the field above.
Version	Char	34	system supplied	Version number of the part. This field reflects the version of the entitlement Part No entered in the field above.
Rights to Use (RTU) Node/User Total	Integer	8	Optional	Quantity of node or user rights-to-use authorized by this purchased entitlement.
Node/User Allocated	Integer	8	system supplied	Quantity of node or user rights under the license entitlement currently allocated by licenses mapped to the entitlement. This value is calculated by the system and reflects the total number of active allocations of those licenses.
Node/User Remaining	Integer	8	system supplied	Quantity of node or user rights under a license entitlement not yet consumed by the mapping of licenses to the entitlement.
Node/User Under Maint	Integer	8	system supplied	Quantity of node or user rights-to-use currently under maintenance.
Vendor ID	Char	6	optional	Code for the vendor from whom the item was purchased.
PO Number	Char	10	optional	Identifier of the purchase order against which the item was received.
Receive Date	Date		optional	Date item was received from vendor.
Maint Contract ID	Char	10	optional	Identifier for the Maintenance Contract under which the item is covered.
Maint Exp Date	Date		optional	Date the maintenance contract expired.

**Table 4.3.4-18. ILM-Entitlement Form Fields Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Comment	Char	30	Optional	Miscellaneous information specific to the item.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.
Licenses	Page		system-supplied	This page lists the licenses that are associated with the license entitlement record.

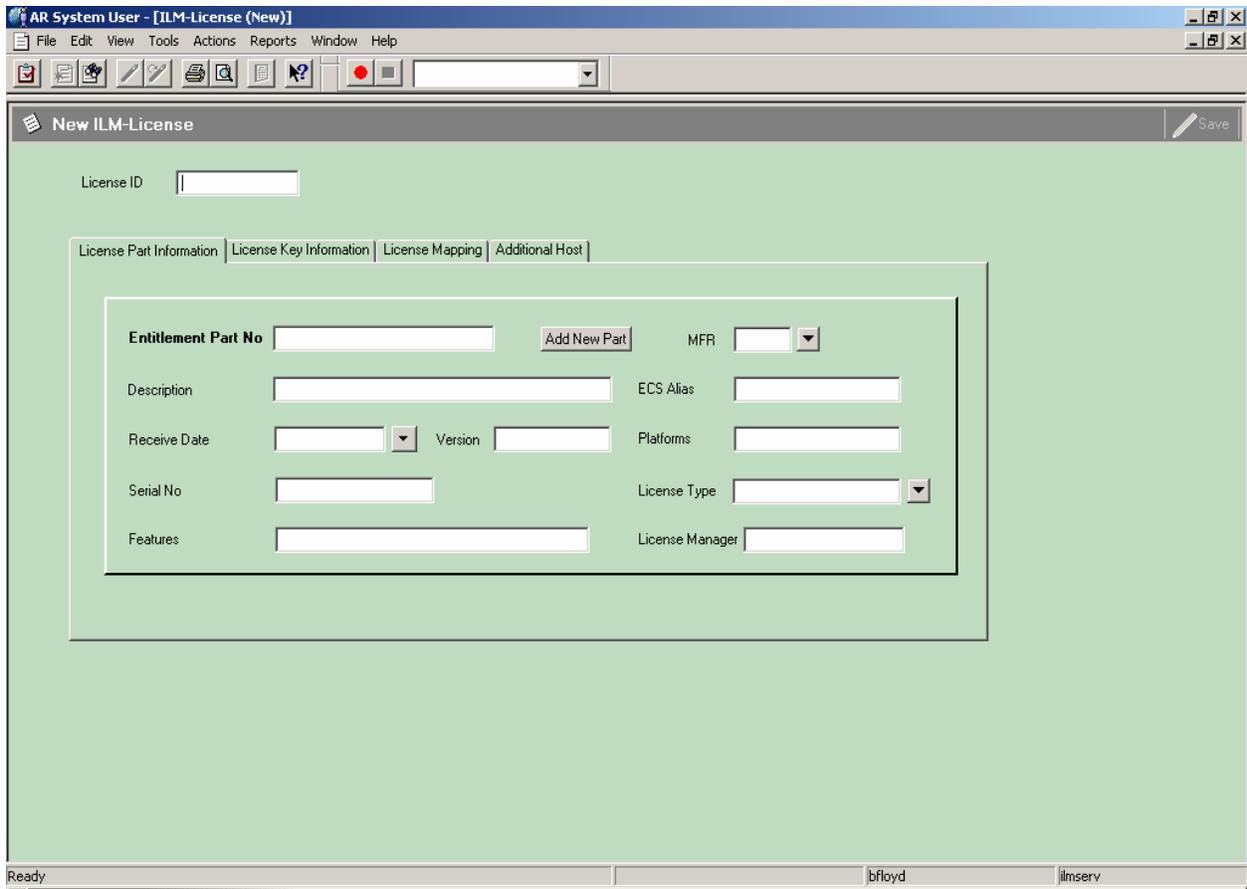
The following buttons are unique to this form:

- Add New Part – Activates the ILM-License Entitlement Part form. This allows the operator to add new parts.
- Add New License – Displays the ILM-License form (figure 4.3.4-34) to allow the SLA to add new licenses.
- Adjust RTUs – Facilitates adjustments of the right-to-use numbers.

#### **4.3.4.4.3. ILM-License GUI**

The ILM-License form (Figures 4.3.4-33 – 4.3.4-36) maintains records of software licenses obtained from vendors. This form also maintains records about the hosts and sites to which the licenses have been allocated. Licenses can be mapped to purchase license entitlements so that consumption of license rights can be tracked.

A license is a euphemism for the rights granted a number of user to operate a software product or one or more of the product’s versions or features concurrently on certain machines. These rights are often encoded in a license “key”, but not all products employ such keys.



**Figure 4.3.4-33. ILM-License GUI (1 of 4)**

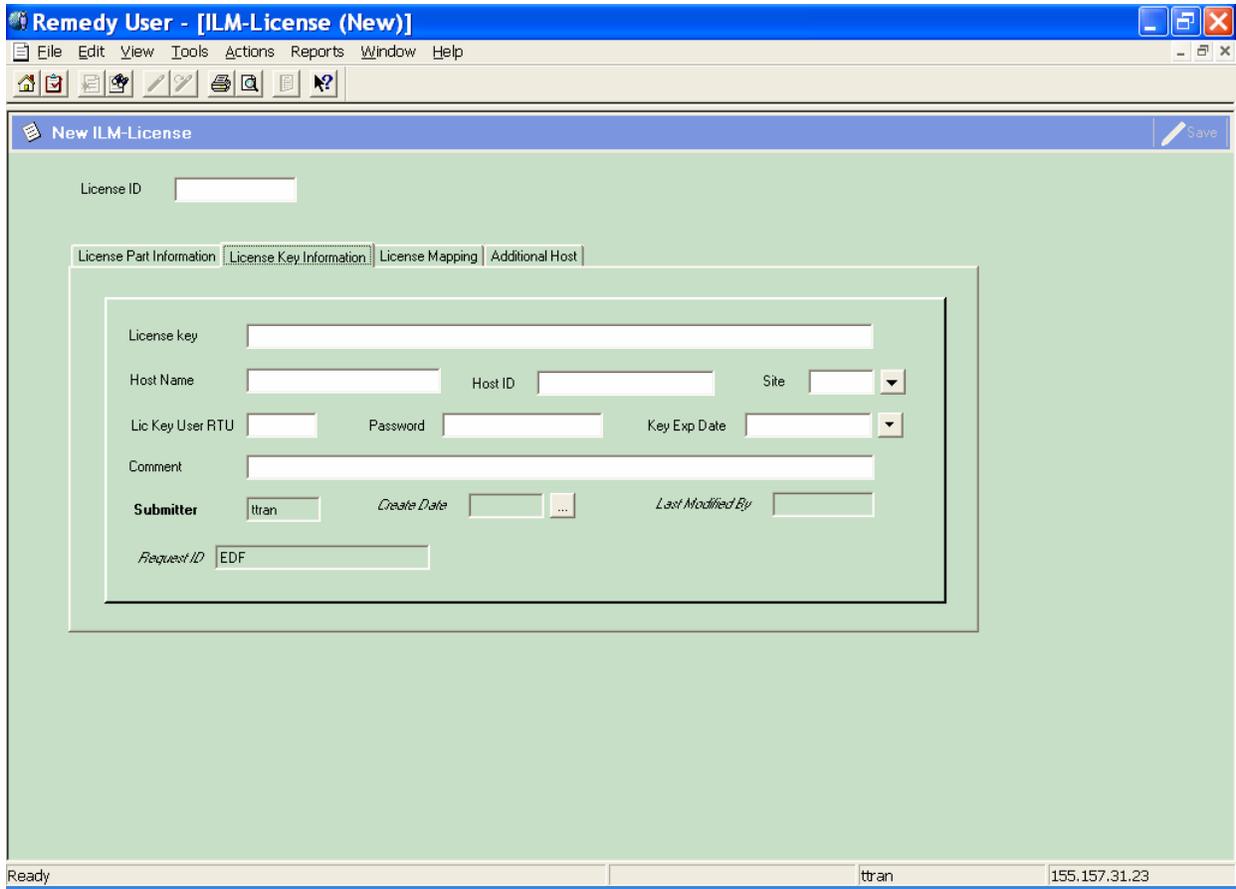
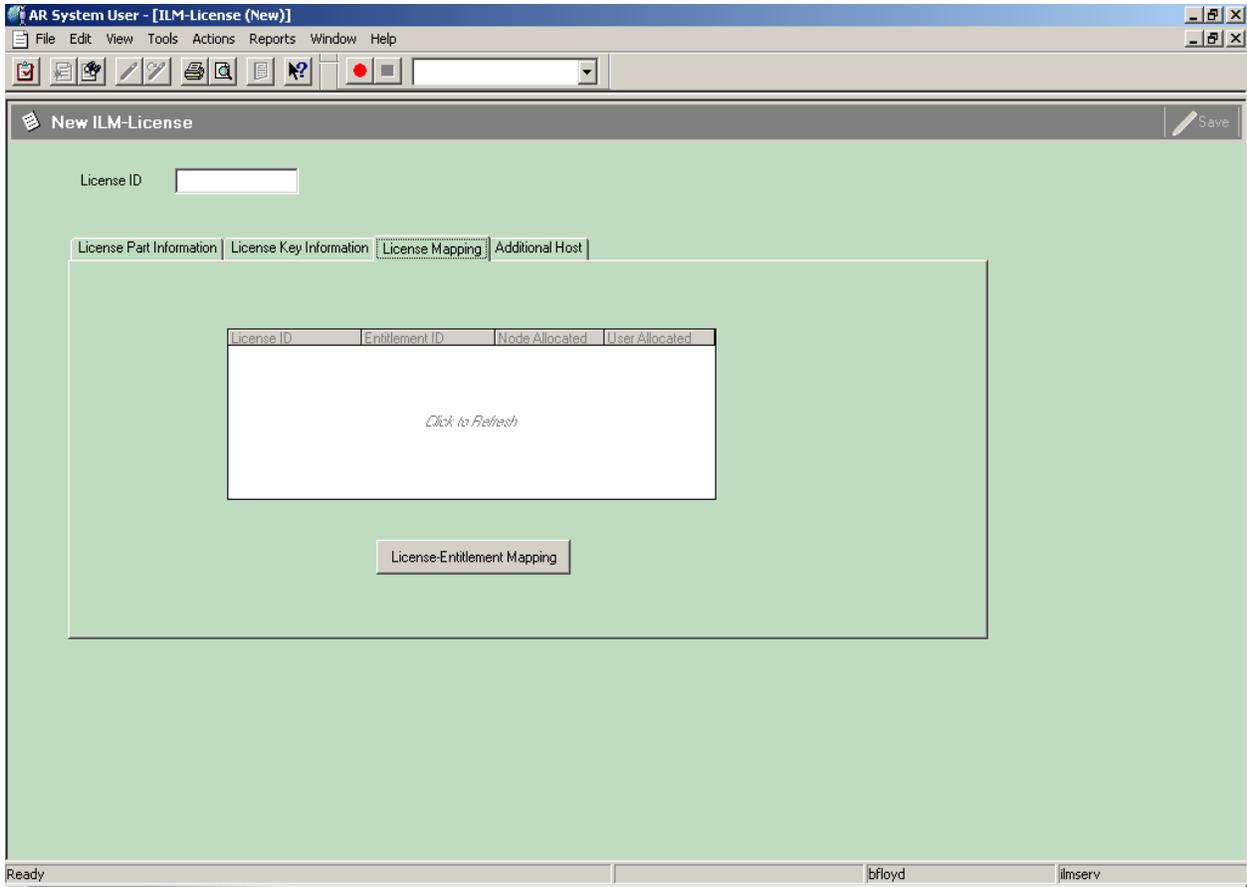
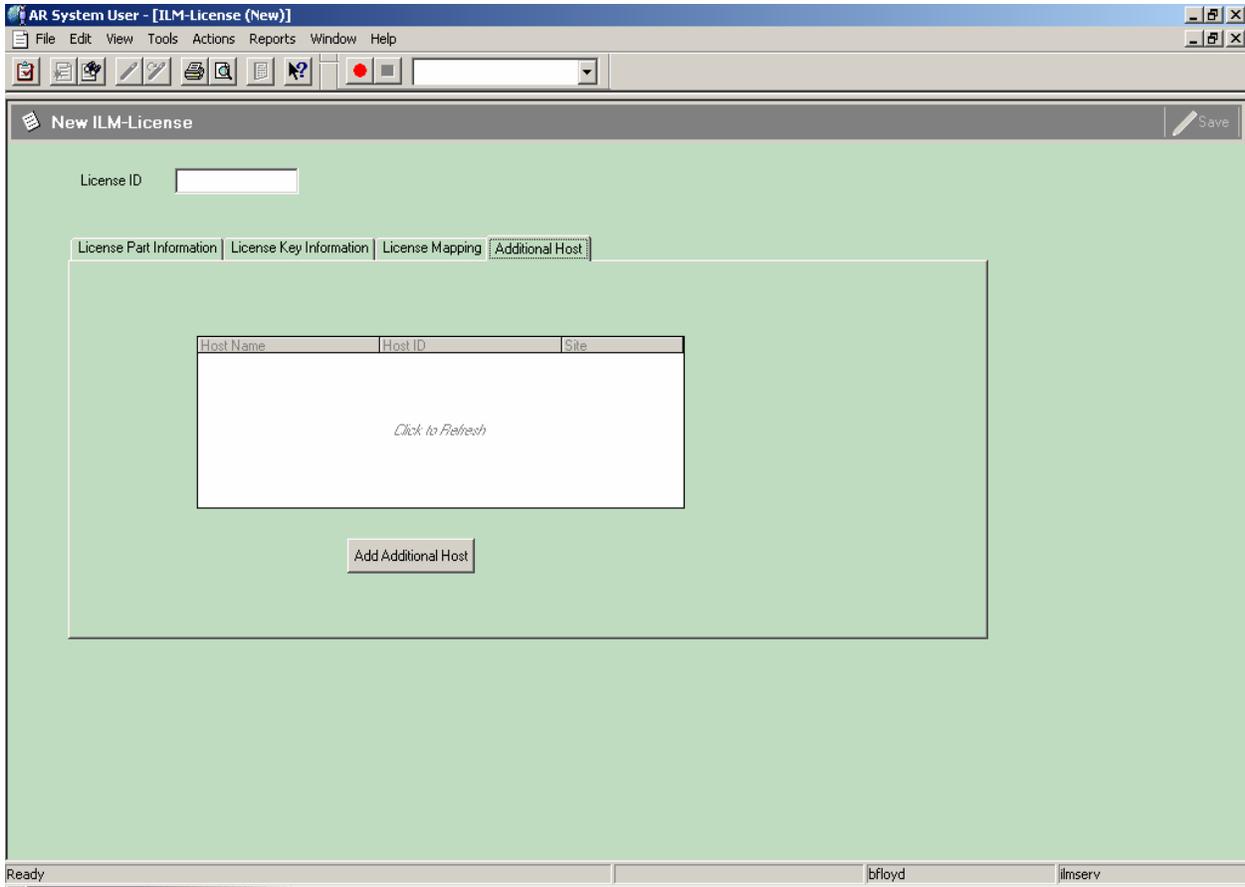


Figure 4.3.4-34. ILM-License GUI (2 of 4)



**Figure 4.3.4-35. ILM-License GUI (3 of 4)**



**Figure 4.3.4-36. ILM-License GUI (4 of 4)**

Table 4.3.3-19 provides fields definitions for the ILM-License form.

**Table 4.3.4-19. ILM-License Form Fields Descriptions (1 of 3)**

Field Name	Data Type	Size	Entry	Description
License ID	Char	10	System Supplies	Unique designator for a license.
Entitlement Part No	Char	34	required	Manufacturer's or vendor's part number for the entitlement.
MFR	Char	6	system supplied	Code for the manufacturer from whom the item was purchased. This field reflects the MFR of the entitlement Part No entered in the field above.
Description	Char	50	system supplied	Manufacturer's or vendor's description for the entitlement. This field reflects the description of the entitlement Part No entered in the field above.

**Table 4.3.4-19. ILM-License Form Fields Descriptions (2 of 3)**

Field Name	Data Type	Size	Entry	Description
ECS Alias	Char	30	system supplied	Common name used in ECS for the licensed product and all its versions and variants. This field reflects the ECS Alias of the entitlement Part No entered in the field above.
Receive Date	Date		optional	Date the license key and/or data arrived.
Version	Char	34	system supplied	Version number of the part. This field reflects the version of the entitlement Part No entered in the field above.
Platforms	Char	15	optional	One or more codes for the types of machines to which the license applies (e.g., Sun, SGI, PC, etc.)
Serial No	Char	30	optional	Vendor-supplied serial number for the license or the product being licensed.
License Type	Char	16	system supplied	Classification that distinguishes among licenses according to rules of use. This field reflects the license type of the entitlement Part No entered in the field above.
Features	Char	54	optional	Name(s) of one or more features of the licensed product that are covered by the license.
License Manager	Char	12	optional	Technology employed in managing the license on-line (e.g., flexlm, proprietary, etc.)
License Key	Char	50	optional	Char of alphanumeric characters that represent the provisions for a license in an encoded form.
Host Name	Char	30	optional	ECS Name of a machine to which the license is allocated.
Host ID	Char	20	optional	Host id of the license server machine supplied to the vendor when requesting the license. This is an information only field. Allocations of licenses to machines are accomplished via the License Allocation Manager screen.
Site	Char	6	Optional	Code for the site to which the license is allocated.
Lic Key User RTU	Integer	8	optional	Number of users authorized by the license to run the licensed product concurrently on a single network. This value limits the user rights-to-use that can be recorded in the license's allocation records.
Password	Char	20	optional	Password supplied along with the license key by the vendor. This is an information only field.
Key Exp Date	Date		optional	Date on which the license key is no longer usable.
Comment	Char	60	optional	Comment to be stored in the record.
Submitter	Char	30	system-supplied	The user whom created the record.

**Table 4.3.4-19. ILM-License Form Fields Descriptions (3 of 3)**

Field Name	Data Type	Size	Entry	Description
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.

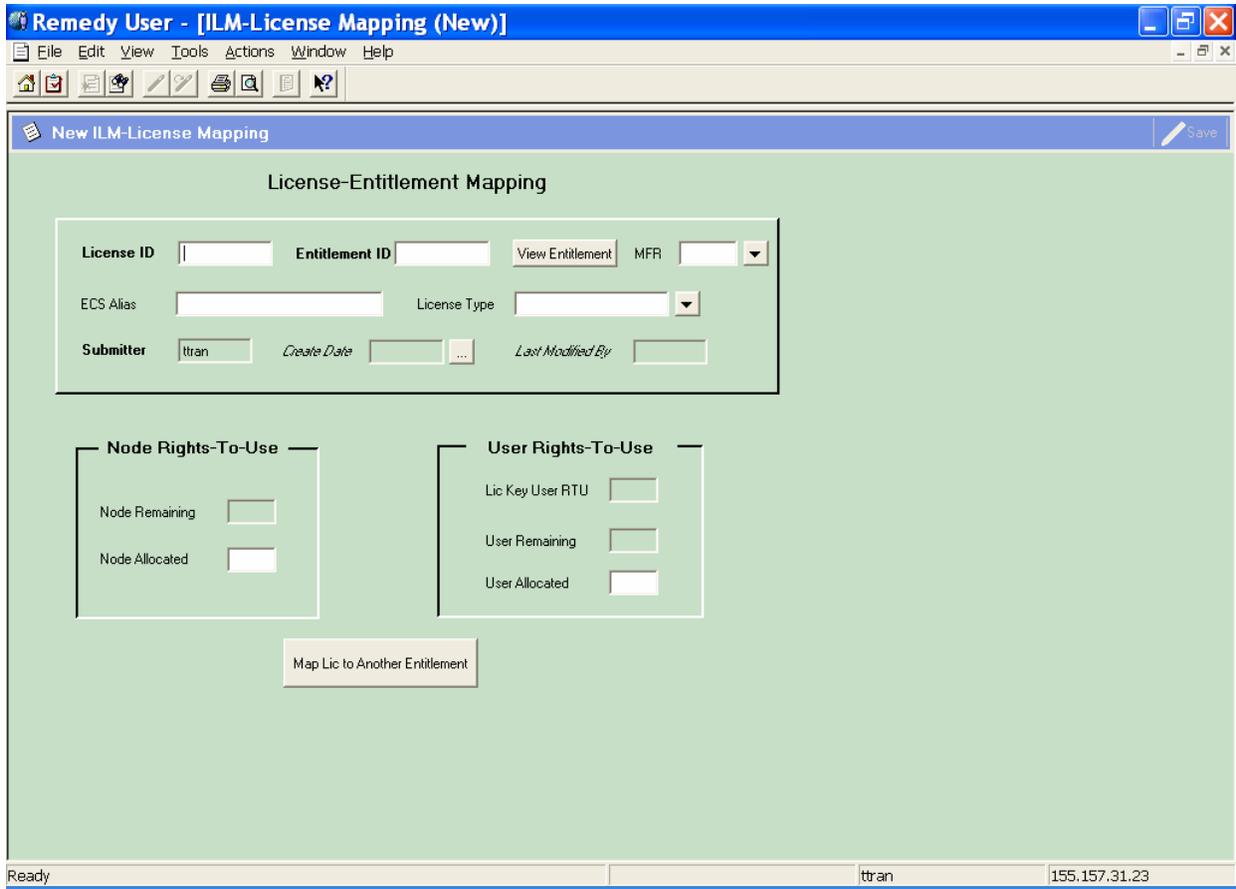
The following buttons are unique to this form:

- Add New Part – Activates the ILM-License Product form. This allows the operator to add new parts.
- Add Additional Host – activates the ILM-Additional host form to allow the SLA to add redundant host or backup server to the license.
- License-Entitlement Mapping - activates the ILM-License Mapping form that allows the SLA to map the license to the purchased entitlement.

#### **4.3.4.4.4 ILM-License Mapping GUI**

The ILM-License Mapping form (Figure 4.3.4.2-37) manages the mapping of a license to purchased entitlements and specifies how many node and/or user rights-to-use the license is consuming from each. The form ensures that:

- a) the rights-to-use attributed to an entitlement do not exceed the entitlement's rights remaining;
- b) the sum of the rights being attributed to all entitlements do not exceed the rights-to-use for the license.



**Figure 4.3.4-37. ILM-License Mapping GUI**

Table 4.3.4-20 describes the fields on the License-Mapping form.

**Table 4.3.4-20. ILM-License Mapping Form Fields Descriptions**

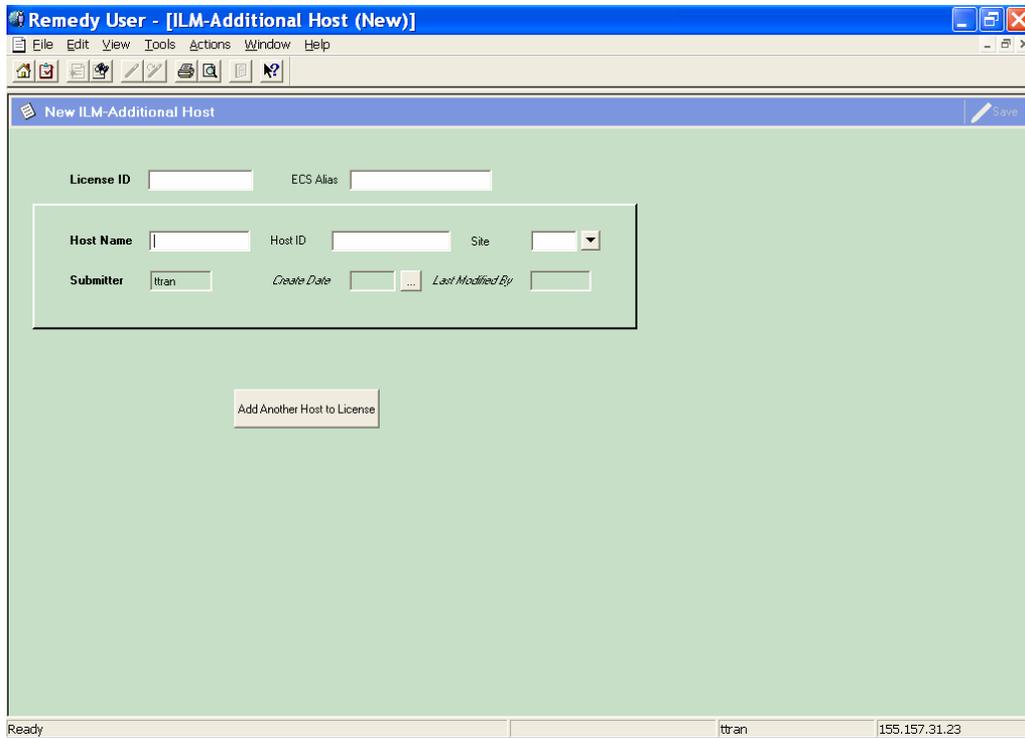
Field Name	Data Type	Size	Entry	Description
License ID	Char	10	System Supplies	Unique designator for a license.
Entitlement ID	Char	10	required	Identifier for a purchased license entitlement.
MFR	Char	6	optional	Code for the manufacturer from whom the item was purchased.
ECS Alias	Char	40	system supplied	Common name used in ECS for the licensed product and all its versions and variants.
License Type				
Submitter	Char	30	system- supplied	The user that created the record.
Create Date	Date		system- supplied	Date the record was created.
Last Modified By	Char	30	system- supplied	The user who last modified the record.
Lic Key User Rtu	Numeric	8	system supplied	Number of users authorized by the license to run the licensed product concurrently on a single network. This value limits the user rights-to-use that can be recorded in the license's allocation records.
Node/User Remaining	Numeric	8	system supplied	Quantity of node or user rights under a license entitlement not yet consumed by the mapping of licenses to the entitlement.
Node/User Allocated	Numeric	8	optional	Number of node or user rights-to-use to be counted under the entitlement as having been consumed by the license. The value may not exceed the current value plus the rights remaining under the entitlement.

The following buttons are unique to this form:

- The “View Entitlement” button enables the operator to display the License Entitlement record that the license is being mapped to.
- The “Map Lic to Another Entitlement” button enables the operator to map the currently displayed License ID to another Entitlement record.

#### **4.3.4.4.5 ILM-Additional Host GUI**

The ILM-Additional Host form (Figure 4.3.4-38) is used for maintaining records about backup or redundant license servers for machines to which a license has been allocated. Identifying additional hosts has no effect on calculations of entitlements' node or user rights-to-use consumed or remaining, but is useful for tracking where licenses are supposed to be or may be installed.



**Figure 4.3.4-38. ILM-Additional Host GUI**

Table 4.3.4-21 describes the fields on the ILM-Additional Host form.

**Table 4.3.4-21. ILM-Additional Host Form Fields Descriptions**

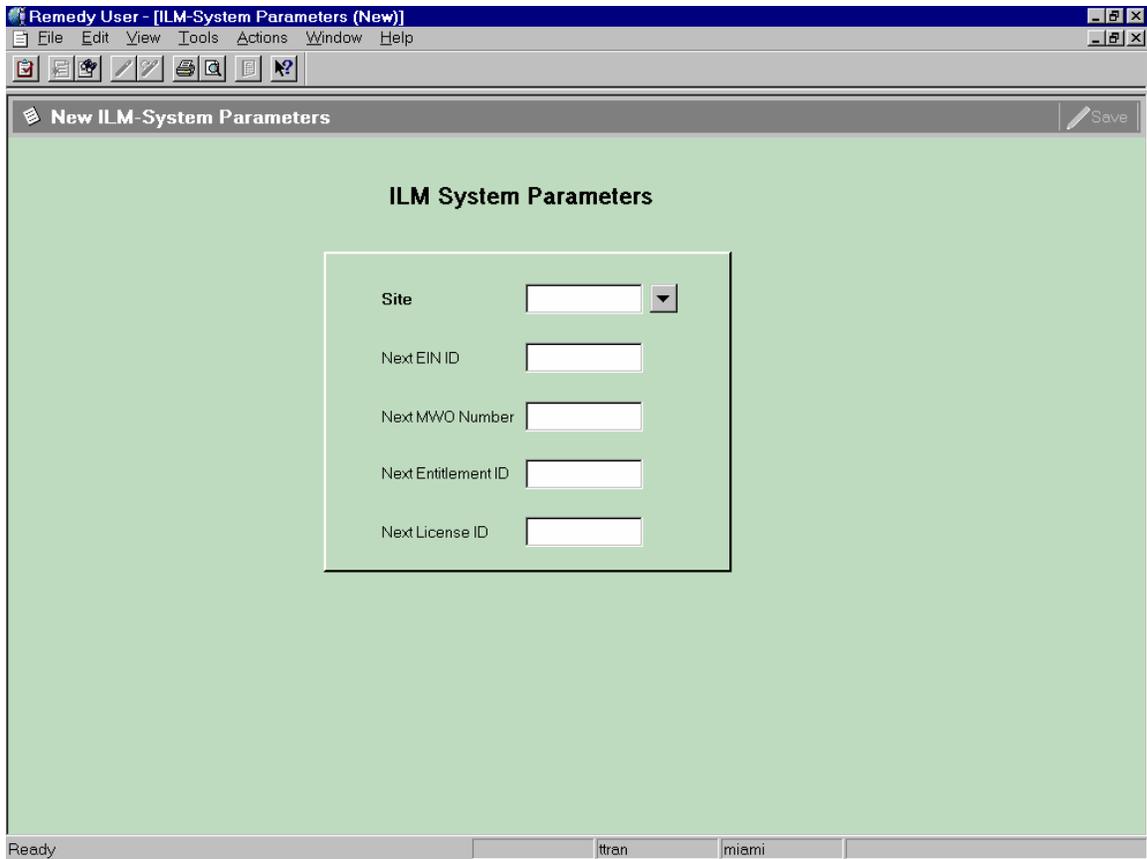
Field Name	Data Type	Size	Entry	Description
License ID	Char	10	System Supplied	Unique designator for a license. Derived from the displayed license.
ECS Alias	Char	30	System Supplied	Common name used in ECS for the licensed product and all its versions and variants.
Host Name	Char	30	optional	ECS name of a machine that is a backup or redundant license server for the one to which the license is principally allocated.
Host ID	Char	20	optional	Host id of a machine that is a backup or redundant license server for the one to which the license is principally allocated.
Site	Char	6	Optional	Code for the site to which the license is allocated.
Submitter	Char	30	system-supplied	The user whom created the record.
Create Date	Date		system-supplied	Date the record was created.
Last Modified By	Char	30	system-supplied	The last date the record was modified.

The “Add Another Host to License” Button enables the operator to allocated a license to more than one host. This is usually done to assign licenses to backup or redundant license servers

#### **4.3.4.5 ILM-System Parameters**

The ILM-System Parameters form (Figure 4.3.4-39) is for maintaining system-wide Remedy-ILM parameters and is principally used for initializing certain identifier fields.

Several fields have particular significance for ILM. The Site ID field contains the code for the ECS site where the operator’s copy of Remedy is installed. This field is interrogated by ILM processes that have to determine which assets belong to the local site. The Next EIN ID field is used by Remedy to keep track of the most recently used, automatically-assigned EIN. Remedy increment the field whenever an operator creates a new EIN when creating records via ILM-EIN form.



**Figure 4.3.4-39. ILM-System Parameters GUI**

Table 4.3.4-22 describes the fields on the ILM-System Parameters form.

**Table 4.3.4-22. ILM-System Parameters Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Site	Char	6	required	Code that identifies the ECS site where this Remedy system is installed.
Next EIN ID	Char	20	system-supplied, but modifiable	Field containing the next sequentially-available identifier when assigning EIN numbers automatically.
Next MWO Number	Char	10	system-supplied, but modifiable	Field containing the next MWO number to be used.
Next Entitlement ID	Char	10	system-supplied, but modifiable	Field containing the next entitlement id number to be used.
Next License ID	Char	10	system-supplied, but modifiable	Field containing the next license id number to be used.

#### 4.3.4.6 User GUI

The User form, shown in Figure 4.3.4-40, is used by the administrator to add, modify or remove users of the Action Request (AR) System. The "User" form is used in conjunction with the "Group" form to provide users with permissions ultimately determining which operations individual users can perform and which forms and fields they can access. For more information on the "User" form and the AR System access control, refer to the Action Request System Server Administrator's Guide.

The screenshot shows a web browser window titled "AR System User - [User (New)]". The browser's menu bar includes "File", "Edit", "View", "Tools", "Actions", "Window", and "Help". The toolbar contains various icons for file operations and a search box. The main content area is a form titled "New User" with a "Save" button in the top right corner. The form fields are organized as follows:

- Entry ID:** A text input field.
- Status:** Radio buttons for "Current" (selected).
- License Type:** Radio buttons for "Read" (selected), "Fixed", and "Floating".
- Login Name:** A text input field.
- Password:** A text input field.
- Email Address:** A text input field with a browse button (...).
- Group List:** A dropdown menu with a browse button (...).
- Full Name:** A text input field with a browse button (...).
- Phone Number:** A text input field.
- Home DAAC:** A text input field.
- Default Notify Mechanism:** Radio buttons for "None", "Notifier" (selected), and "Email".
- Full Text License Type:** Radio buttons for "None" (selected), "Fixed", and "Floating".
- Creator:** A text input field.
- Create Date:** A text input field with a browse button (...).
- Last Modified By:** A text input field.
- Modified Date:** A text input field with a browse button (...).
- Instance ID:** A text input field.
- Object ID:** A text input field.

The status bar at the bottom of the browser window shows the username "bfloyd" and the server name "ilmserv".

**Figure 4.3.4-40. User GUI**

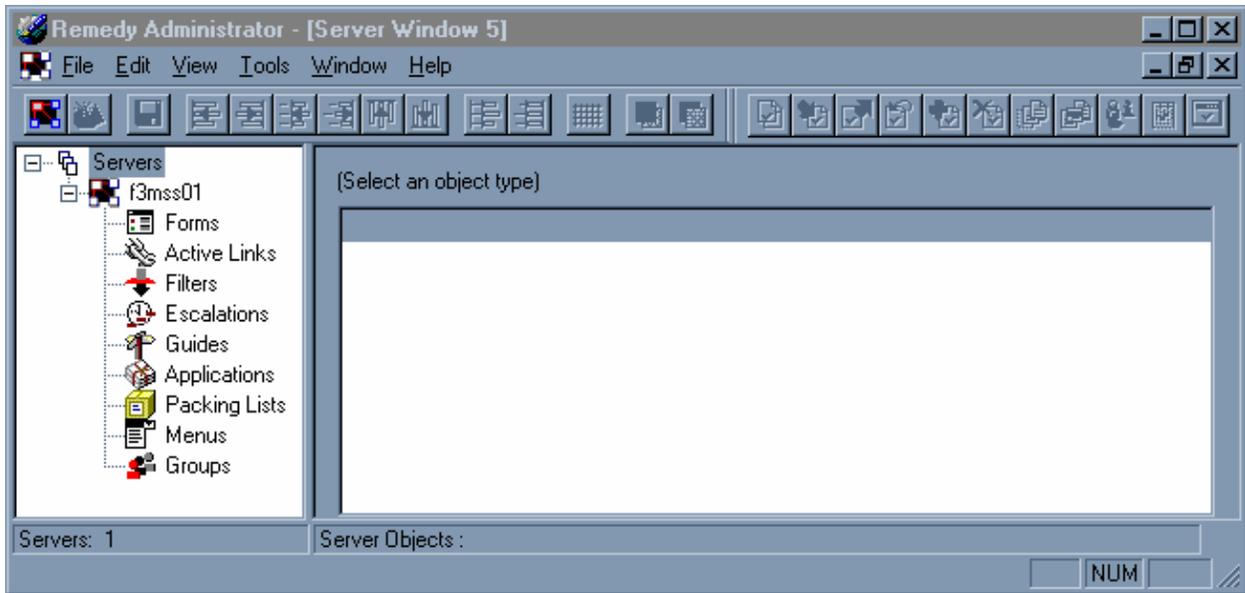
**Table 4.3.4-23. User Form Fields Descriptions**

Field Name	Data Type	Size	Entry	Description
Entry-Id	Character	15	System generated	Entry ID of user
Status	Selection	*	Required	Is user current or not as shown by the "current" button.
License Type	Selection	*	Required	What type of license does this user have? (e.g., read, fixed, floating)
Login name	Character	30	Required	Login name of user
Password	Character	30	Optional	Password of User
Email Address	Character	255	Required	E-mail address of User
Group list	Character	255	Optional	Groups to which the user belongs
Full Name	Character	128	Required	Full Name of User
Phone Number	Character	55	Required	Phone Number of User
Home DAAC	Character	55	Required	Home DAAC of User
Default Notify Mechanism	Selection	*	Optional	Notification method (e.g., None, Notifier, and Email buttons.)
Full Text License Type	Selection		Required	The Full Text License capability is not available. So, the selection value should be "None."
Creator	Character	30	Required	Person who created the user account
Create-date	Date/Time	17	System generated	Date and time the entry was created at the present site (mm/dd/yy hh:mm:ss)
Last-modified-by	Character	30	System generated	User ID of person that last modified the user entry
Modified-date	Date/Time	17	System generated	Date and time of last modification to user entry (mm/dd/yy hh:mm:ss)
Instance ID	Character	38	Optional	A Remedy reserve field for Remedy's use only.
Object ID	Character	38	Optional	A Remedy reserver field for Remedy's use only.

**Note:** the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

#### 4.3.4.7 Remedy's Admin Tool GUI

The Remedy Administrator Tool is the tool one uses to create, modify, and delete Remedy objects (e.g. forms and menus). Figure 4.3.4-41 shows the main Administrator Tool GUI and its starting screen, the server window, and the workflow objects categories.



**Figure 4.3.4-41. Admin Tool GUI**

Table 4.3.4-24 provides a description of the Admin Tool GUI Workflow objects. For more information on these options, see *Remedy's Action Request System Administrator's Guide*, Vol. 1, Chapter 4, and/or the Remedy Administrator Tutorial using the Administrator Tool's Help menu.

**Table 4.3.4-24. Admin Tool GUI, Workflow Object Descriptions**

Workflow Object	Size	Entry	Description
Forms	Variable	System Generated	List of available forms.
Active links	Variable	System Generated	List of available active links.
Filters	Variable	System Generated	List of available filters.
Escalations	Variable	System Generated	List of available escalations.
Guides	Variable	System Generated	List of available guides.
Applications	Variable	System Generated	List of available applications
Packing lists	Variable	System Generated	List of available packing lists
Menus	Variable	System Generated	List of available menus
Groups	Variable	System Generated	List of available groups

#### 4.3.4.8 Databases

Remedy's Action Request System uses the Sybase database called ARSystem that resides on the Remedy server machines. Tables and columns are created, modified, and deleted when forms are built and edited. This is all done automatically and is invisible to the user.

#### 4.3.4.9 Special Constraints

Note that while ILM forms are open to all operators, and operators have view privileges to the user form, only system administrators have the ability to modify forms and tools presented in this section. Privileges are set according to DAAC policy.

#### 4.3.4.10 Outputs

Output from Remedy's Action Request System (besides output to the screen in the form of its GUIs) is in the form of a report either to the printer or to a file (reports discussed in Section 4.3.4.16) or a log entry as shown in Table 4.3.4-25.

In the Remedy **aradmin** tool, you may enable and disable error logging at any time. Select File-> Server Information-> Log Files to display the current location of log files that have been enabled. The format of the messages is similar to the Unix syslog as seen in this example:

**Table 4.3.4-25. Remedy Log File Messages Example**

Mon Feb 23 16:28:16 1998	390600 : Failure during SQL operation to the database (ARERR 552)
Mon Feb 23 16:28:16 1998	Unable to connect: SQL Server is unavailable or does not exist. (Sybase 20009) : Connection refused
Mon Feb 23 16:28:16 1998	Unable to connect: SQL Server is unavailable or does not exist. (Sybase 20009) : Connection refused

#### 4.3.4.11 Event and Error Messages

For Remedy's Action Request System's system messages see the *Action Request System Error Messages Guide*.

Table 4.3.4-26 lists non-system failure related messages that appear on the operator's screen.

**Table 4.3.4-26. Non-System Failure Related Error Messages (1 of 6)**

Error Message Char	Cause	Action
<b>Inventory Management</b>		
Parent EIN does not exist. Enter the correct Parent EIN.	Attempting to associate a component EIN to a Parent EIN that does not exist.	Enter the correct Parent EIN
Parent EIN, \$Parent EIN\$, is a component. Please enter the correct Parent EIN number.	Attempting to associate a component EIN to a Parent EIN that is a component to another EIN Structure	Enter the correct Parent EIN.
Parent EIN, \$Parent EIN\$, is not hardware. Enter the correct Parent EIN!	Attempting to associate a component EIN to a Parent EIN that is not hardware.	Enter the correct Parent EIN.
Part not found. Add new part into the part table or enter the correct part no.	Attempting to enter a part number that does not exist in the database.	Enter the correct Part No into the ILM-OEM Parts form or enter the correct part no.

**Table 4.3.4-26. Non-System Failure Related Error Messages (2 of 6)**

<b>Error Message Char</b>	<b>Cause</b>	<b>Action</b>
Part Number, \$Part No\$, already exists. Enter the correct Part Number!	Attempting to add a new Part No enter the ILM-Oem Parts form where the Part No already existed in the form.	Enter the correct Part number.
EIN is a component to Parent EIN. Update the Parent EIN's ECS name instead.	Attempting to update an ECS Name of a component EIN.	Update the Parent EIN's ECS Name.
New Parent EIN is the same as the old Parent EIN. Enter the correct new Parent EIN.	Attempting to relocate to relocate an item to the same Parent EIN.	Enter the correct New Parent EIN.
EIN already existed. Enter the correct EIN.	Attempting to create a new EIN that is already existed in the database.	Enter the correct EIN number.
A record for Location, \$Location\$, with Building, \$Building\$, already exists. Enter the correct Location and its associated Building!	Attempting to create a new location in the ILM-Inventory location form where the combination of location and building values already existed in the form.	Do not enter the new location and use the existed one.
EIN (\$EIN\$) is a Parent to EIN (\$EIN is Parent\$). Can not assign a Parent to another Parent structure.	Attempting to assign a Parent EIN as a component to an EIN structure.	Verify the Component EIN and the Parent EIN.
Audit Date (\$Audit Date\$) can not be greater than current date. Enter the correct audit date.	Attempting to update the audit date to a date greater than the current date.	Enter the correct audit date.
Receive Date (\$Receive Date\$) can not be greater than the current date (\$DATE\$). Enter the correct receive date.	Attempting to update the receive date to a date greater than the current date.	Enter the correct receive date.
Vendor ID, \$Vendor ID\$, already exists. Enter the correct Vendor ID!	Attempting to add a new vendor id that already existed in the ILM-Vendor-MFR form.	Use the existing Vendor ID if the vendor name is the same. If the vendor name is not the same, use another code to define the new vendor.
Site, \$Site\$, already exists. Enter the correct Site!	Attempting to add a site code that already existed in the ILM-Site form.	Use the existing site code.
Item Status, \$Item Status\$, already exists. Enter the correct Item Status!	Attempting to add a new item status that already existed in the ILM-Status Code form.	Enter the correct item status.
<b><i>EIN Transactions</i></b>		
Parent EIN field is a required field. Enter a Parent EIN value into the Parent EIN field.	Attempting to perform an EIN transacion where the Parent EIN value is not provided in the Parent EIN field.	Enter the correct Parent EIN value into the Parent EIN.

**Table 4.3.4-26. Non-System Failure Related Error Messages (3 of 6)**

Error Message Char	Cause	Action
Parent EIN (\$Parent EIN\$) does not exist. Enter the correct Parent EIN.	Attempting to perform an EIN transaction on the Parent EIN where the Parent EIN does not exist in the ILM-EIN form.	Enter the correct Parent EIN.
Parent EIN, \$Parent EIN\$ is a component of Parent EIN \$Temp Parent Parent\$. Perform transaction on the Parent EIN, \$Temp Parent Parent\$ instead.	Attempting to perform an EIN transaction on a component.	Enter the correct Parent EIN.
One or more of these fields is not completed (Archive (P)arent-(C)omponent and Archive Type. Enter values into both of these fields and execute the transaction again.	Attempting to perform an archive transaction where the Archive (P)arent-(C)omponent and/or Archive Type fields is not completed.	Complete both of these fields.
New Parent EIN is a component to Parent EIN (\$Temp New Parent Parent\$). Enter another New Parent EIN.	Attempting to relocate component(s) to a new Parent EIN where the new Parent EIN is a component to another EIN Structure.	Enter the correct new parent EIN.
New Parent EIN does not exist. Enter another New Parent EIN.	Attempting to relocate component(s) to a new parent EIN where the new parent EIN does not exist in the ILM-EIN form.	Enter the correct new parent EIN.
New Parent EIN (\$New Parent EIN\$) is not hardware. Enter another New Parent EIN value.	Attempting to relocate component(s) to a new parent EIN where the new parent EIN is something else other than hardware.	Enter the correct new parent EIN.
New Parent EIN (\$New Parent EIN\$) is the same as the old Parent EIN. Enter another new Parent EIN.	Attempting to relocate component(s) to a new parent EIN where the new parent EIN is the same as the old parent EIN	Enter the correct new parent EIN.
New Location values (New Location, New Building, or New Room) are not completed. Complete all the new locatioon values.	Attempting to perform a transaction where all the new location values are not completed.	Make sure all the new location values are completed.
<b>Maintenance Work Order</b>		
Parent EIN (\$Parent EIN\$) does not exist. Enter the correct Parent EIN.	Attempting to create a new maintenance work order where the Parent EIN does not exist in the ILM-EIN form.	Enter the correct Parent EIN.
EIN, \$Parent EIN\$, is not a parent. Enter the correct Parent EIN!	Attempting to create a new MWO where the parent EIN entered is a component of some EIN structure.	Enter the correct parent EIN.

**Table 4.3.4-26. Non-System Failure Related Error Messages (4 of 6)**

Error Message Char	Cause	Action
ALDT 1 End Date-Time (\$ALDT End Date-Time\$) can not be greater than current date.	Attempting to enter an ALDT End Date-Time that is greater than the current date and time.	Enter the correct ALDT End date-time.
Notification Date (\$Notification Date-Time\$) can not be greater than current date.	Attempting to enter a notification Date-Time that is greater than the current date and time.	Enter the correct notification date-time.
Vendor Complete Date-Time (\$Vendor Complete Date-Time\$) can not be greater than current date.	Attempting to enter an vendor complete Date-Time that is greater than the current date and time.	Enter the correct vendor complete date-time.
Vendor Call Date-Time (\$Vendor Call Date-Time\$) can not be greater than current date.	Attempting to enter an vendor call Date-Time that is greater than the current date and time.	Enter the correct vendor call date-time.
ALDT Start Date-Time (\$ALDT Start Date-Time\$) can not be greater than current date.	Attempting to enter an ALDT start Date-Time that is greater than the current date and time.	Enter the correct ALDT start date-time.
Failure Date (\$Failure Date-Time\$) can not be greater than current date.	Attempting to enter an failure Date-Time that is greater than the current date and time.	Enter the correct failure date-time.
Vendor Arrive Date-Time (\$Vendor Arrive Date-Time\$) can not be greater than current date.	Attempting to enter an vendor arrive Date-Time that is greater than the current date and time.	Enter the correct vendor arrive date-time.
Vendor Initial Response Date-Time (\$Vendor Initial Resp Date-Time\$) can not be greater than current date.	Attempting to enter an vendor initial response Date-Time that is greater than the current date and time.	Enter the correct vendor initial response date-time.
The MWO must already be created and you must have the MWO displayed in a Search/Modify window before clicking the Add Fail-Replacement Component Button!	Attempting to add a new work order line item where the work order information is blank.	Use the ILM-MWO form to find the appropriate work order and press the "Add Fail-Replacement Component" button to start adding line items to that work order.
Component EIN is the same as the MWO Parent EIN. Enter the correct component EIN.	Attempting to add a work order line item where the component EIN is the same as the MWO's Parent EIN.	Enter the correct component EIN.
New Parent EIN is the same as the MWO's Parent EIN. Enter the correct New Parent EIN.	Attempting to add a work order line item to move a component to a new EIN structure where the new parent EIN is the same as the MWO's Parent EIN.	Enter the correct new parent EIN value.
New Parent EIN (\$New Parent EIN\$) is a component to Parent EIN (\$New Parent EIN Parent\$). Enter the correct New Parent EIN value	Attempting to add a work order line item to move a component to a new EIN structure where the new parent EIN is the same as the MWO's Parent EIN.	Enter the correct new parent EIN value.

**Table 4.3.4-26. Non-System-Failure Related Error Messages (5 of 6)**

Error Message Char	Cause	Action
New Parent EIN does not exist. Enter the correct New Parent EIN.	Attempting to add a work order line item to move a component to a new EIN structure where the new parent EIN does not exist in the ILM-EIN form.	Enter the correct new parent EIN value.
New Parent EIN is not hardware. Enter the correct New Parent EIN value.	Attempting to add a work order line item to move a component to a new EIN structure where the new parent EIN in not hardware.	Enter the correct new parent EIN value.
Component EIN is a parent. Enter the correct Component EIN value.	Attempting to add a work order line item where the component EIN is a parent.	Enter the correct component EIN value.
Line Item does not have the correct event type and maint code. Enter the correct event type and maint code.	Entering the incorrect combination of event type and maint code in the ILM-MWO Line Item form.	Enter the correct event type and maint code.
<b>License Management</b>		
Entitlement Part No does not exist. Enter the correct part number or add the new part into the ILM-License Entitlement Part form.	Attempting to associate entitlement with an Entitlement Part no that does not exist in the ILM-License Entitlement Form.	Enter the correct part number or add the new part into the ILM-License Entitlement Part form.
Contract ID, \$Contract ID\$, already exists. Enter the correct Contract ID!	Attempting to associate a license entitlement with a contract ID where the contract id does not exist in the ILM-Maint contract form.	Enter the correct contract ID.
Entitlement ID does not exist. Enter the correct Entitlement ID.	Attempting to map a license to a purchased entitlement that does not exist in the ILM-Entitlement form.	Enter the correct Entitlement ID.
Node allocated is greater than Node remaining. Reduce number of Right-To-Use or enter another Entitlement ID.	Attempting to map a license to an entitlement where the entitlement node remaining is less than the amount allocating.	Reduce the number of node allocated.
User Allocated is greater than License Key User RTU allocated to the license. Enter the correct User Allocated value.	Attempting to map a license to an entitlement where the user allocated is greater than the license key user rights-to-use.	Reduce the user allocated to equal to or less than the license key RTU.
User Allocated is greater than User RTU Remaining. Lower User Allocated or Enter another Entitlement ID.	Attempting to map a license to an entitlement where the user allocated is greater than the entitlement user rights-to-use remaining	Reduce the user allocated.
This license right-to-use had already been mapped to entitlement \$Ent ID Holder\$.	Attempting to map a node lock license to more than one entitlements.	Do not map the license to another entitlement.

**Table 4.3.4-26. Non-System-Failure Related Error Messages (6 of 6)**

<b>Error Message Char</b>	<b>Cause</b>	<b>Action</b>
Total user allocated (\$Total User Allocated\$) is greater than the license key user RTU. Reduce number of User Allocated	Attempting to map a license to entitlements where the total user allocated is greater than the license key user rights-to-use.	Reduce the user allocated to equal to or less than the license key RTU.
Node allocated or User allocated has not been assigned to this Entitlement ID (\$Entitlement ID\$).	Attempting to map a license to an entitlement where the user did not enter any value in the Node or user allocated.	Enter node or user allocated to map against the entitlement.
Node Allocated can not be greater than one for nodelock licenses. Enter 1 to allocate 1 Right-To-Use for this Nodelock license.	Attempting to allocate more than 1 node rights-to-use for a node lock license.	reduce the number of node rtu allocated to 1.
Combination of Entitlement Part No-MFR and Version \$Temp PN_MFR_Ver\$ already existed. Enter the correct Entitlement Part No.	Attempting to add a new entitlement part into the ILM-License Products form where the combination of the Entitlement Part No, MFR, and version already existed in the database.	use the existing entitlement part information.

#### 4.3.4.12 Reports

Operator may generate ad-hoc reports from any forms (see AR System 4.x User manual on Reporting). However, ILM provides a set of predefined reports that operator can generate through Tools→Report from the Menu bar. Table 4.3.4-27 identifies the predefined reports available in ILM. The figures that follow present a sample of each.

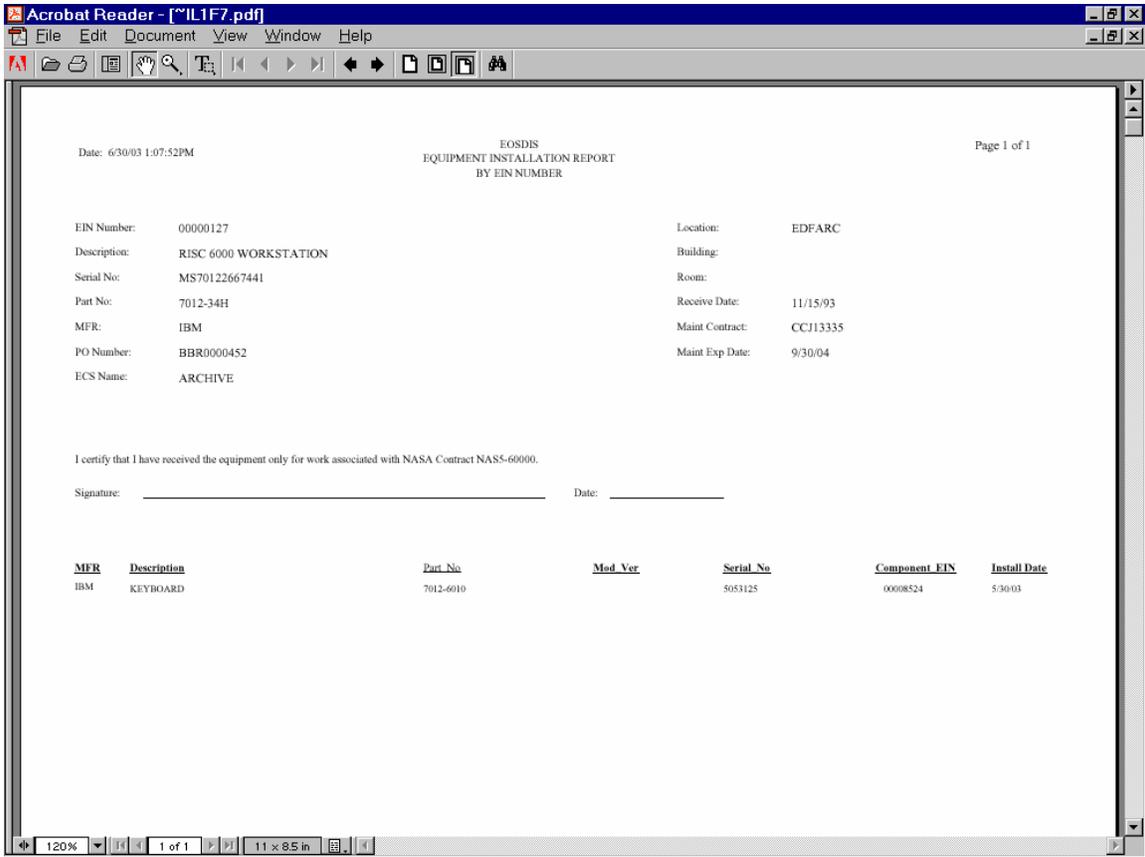
**Table 4.3.4-27. ILM Reports (1 of 2)**

<b>Report Type</b>	<b>Report Description</b>
<b>Inventory Management</b>	
Install/Receipt Report	A report that describes an operator-specified EIN item together with all of its associated components order by EIN number. See Figure 4.3.4-42.
Installation Report	A report that describes an operator-specified EIN item together with its components having status "I" (for installed). See Figure 4.3.4-43.
Parent EIN Report	Provides a listing of only Parent items. See Figure 4.3.4-44.
Parent EIN and total System Cost Report	Provides a listing of only Parent items and the total system cost for each Parent. See Figure 4.3.4-45.
Inventory Report	Provides an ASCII formatted report identifying the inventory items by Parent EIN according to the operator-specified criteria. See Figure 4.3.4-46.
ECS Shipping Report	Provides a listing of items that were shipped within an operator-specified time frame. See Figure 4.3.4-47.
Quarterly Property Management Report	Provides a list of contractor-acquired equipment items by quarter, sorted by Mfr and product description. See Figure 4.3.4-48.

**Table 4.3.4-27. ILM Reports (2 of 2)**

<b>Report Type</b>	<b>Report Description</b>
Purchase Order Cost Report	Provides a list of EINs and their cost associated with an operator-specified purchase order. See Figure 4.3.4-49.
Cost - Selected ECS Managed Property	Provides the quantity and total cost of operator-selected EINs, grouped by type of inventory (Hardware, Software, Consumable, i.e.). See Figure 4.3.4-50.
EIN Transaction History	A list of the transactions processed for operator-specified items during an operator-specified timeframe, sorted by EIN number and "from" location. See Figure 4.3.4-51.
Spare Equipment Report	Provides a list of spare equipment for a selected site or system-wide report. See Figure 4.3.4-52.
<b><i>Maintenance Management</i></b>	
Maintenance Work Order Verification Report	A full description of operator-selected work orders and the items undergoing maintenance action that they cover. See Figure 4.3.4-53.
Maintenance Contract Report	Provides a list of operator-specified maintenance contract and all the associated items the contract covers. See Figure 4.3.4-54.
RMA Work Order Report	Provides an ASCII formatted spreadsheet formatted report with embedded formulas for RMA data. See Figure 4.3.4-55.
<b><i>License Management</i></b>	
License Entitlements Status Report	Lists the status of current license entitlements for licensed software products, sorted by software product, version, and license type. See Figure 4.3.4-56.
License Allocations by Product Report	Lists license allocations for licensed software products, sorted by product, version, and host name. See Figure 4.3.4-57.
License Allocations by Host Report	Lists license allocations, sorted by host name and ECS part alias. See Figure 4.3.4-58.





**Figure 4.3.4-43. Installation Report**

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Parent EIN Report

DATE:6/30/03

Page 1 of 1

<u>Parent EIN</u>	<u>ECS Name</u>	<u>Part No</u>	<u>Description</u>	<u>Serial No</u>	<u>Location</u>	<u>PO Number</u>
00001725	EDCM	90093-07	TERMINAL	03L1680401	EDC	CCW0005539
00002446	EDCM	MICROMMAC-24E	10 BASE T 24 PORT HUB	07097090237041B	EDC	CCW0006853
00011718	EIMOP20	CPU001665-00	INTEL PENTIUM III PROCESSOR 866MHZ	2838627-0001	EDC	CCD0001457
00013483	EIDCS01	A30-WRF4-88GQF	SUN FIRE V880 SERVER-4	216V027C	EDC	CCB0012989
00014088	EDCM	C2525B	HP AUTOFEEDER FOR 4C SCANNER	211603	EDC	H24401

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**Figure 4.3.4-44. Parent EIN Report**

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DATE:6/30/03 Parent EIN and Total System Cost Report Page 1 of 1

<u>Parent EIN</u>	<u>ECS Name</u>	<u>Part No</u>	<u>Description</u>	<u>Serial No</u>	<u>Location</u>	<u>PO Number</u>	<u>System Cost</u>
00001725	EDCM	90093-07	TERMINAL	02E1880401	EDC	CCW0005539	\$ 604.00
00002446	EDCM/MAINT	MICROMMAC-24E	10 BASE T 24 PORT HUB	07097090217041JB	EDC	CCW0008853	\$ 4,720.00
00011718	EIMOP20	CPU001665-00	INTEL PENTIUM III PROCESSOR 866MHZ	2838627-0001	EDC	CCD0001457	\$ 2,411.00
00013483	EIDCS01	A30-WRF4-08GQF	SUN FIRE V880 SERVER-4	216V027C	EDC	CCJ0012989	\$ 54,326.90
00014088	EDCM/MAINT	C2525B	HP AUTOFEEDER FOR 4C SCANNER	211603	EDC	HD4491	\$ 1,209.90

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**Figure 4.3.4-45. Parent EIN and Total System Cost Report**

Parent EIN	Part EIN	Mfr	ECS Name	Audit Date	Stat	Part Num	Serial Num	Unit Cost	Product Description	Location	Bldg	Room	Code	PO Num	Date Rec'd	Vendor
00001838	00001838	SUN	n0dms04	2/6/02	I	A12-UBA1-1E-064AB	645F0AA4	\$8,797.00	Ultra 1 System	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	00001891	SUN	n0dms04	2/6/02	I	X5203A	645G0830	\$1,035.00	UniPak - 4.2 GB 5400 RPM FW SCSI-2	NSIDC	NSIDC	209	H	CCW0005354	12/18/96	SUN
00001838	00003491	SUN	n0dms04	2/6/02	I	X267A	9843KN4545	\$5,000.00	Color Monitor - 20 IN	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	00006793	SUN	n0dms04	2/6/02	I	NE SUN1	LZB64001097	\$0.00	Mouse - 3 Button Track Ball	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	00006794	SUN	n0dms04	2/6/02	I	320-1233-02	9626371319	\$0.00	Keyboard	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009132	SUN	n0dms04	2/6/02	I	X1025A	12603	\$1,500.00	FDDI SINGLE ATTACH SBUS CARD	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009133	SUN	n0dms04	2/6/02	I	X132P	50128227847 6877	\$0.00	Memory - 32MB RAM Expansion (1x32	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009134	SUN	n0dms04	2/6/02	I	X132P	50126227847 6942	\$0.00	Memory - 32MB RAM Expansion (1x32	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009135	SUN	n0dms04	2/6/02	I	X3500A		\$0.00	Country Kit	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009136	SUN	n0dms04	2/6/02	I	X6001A	9625201083	\$90.00	Floppy Drive - 3.5 IN Disk Drive-1	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009137	SUN	n0dms04	2/6/02	I	X6153A	9647723061	\$240.00	CD ROM - Internal SUNCD 4	NSIDC	NSIDC	209	H	CCW0005354	12/2/96	SUN
00001838	C0009839	SUN	n0dms04	2/6/02	I	370-2286-01	9643604099	\$0.00	Hard Drive - Internal for X5204A	NSIDC	NSIDC	209	H	CCW0005354	12/18/96	SUN
00001838	C0045377	SUN	n0dms04	6/25/02	I	X5237A	0145KP6EMS	\$479.20	ULTRA SCSI DISK DRIVE, 18GB INTERN	NSIDC	NSIDC	209	H	CCD0002848	11/27/01	SUN
00001838	C0149507	SUN	n0dms04	1/27/99	I	SOLD-C		\$45.00	Solaris Media for Servers	NSIDC	NSIDC	209	S	CCW0005354	12/2/96	SUN
00001839	00001839	SUN	n0mos20	2/6/02	I	A12-UBA1-1E-064AB	645F0B2C	\$8,797.00	Ultra 1 System	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	00001890	SUN	n0mos20	2/6/02	I	X5203A	645G0868	\$1,035.00	UniPak - 4.2 GB 5400 RPM FW SCSI-2	NSIDC	NSIDC	252	H	CCW0005354	12/18/96	SUN
00001839	00003494	SUN	n0mos20	2/6/02	I	X267A	9647GI3704	\$5,000.00	Color Monitor - 20 IN	NSIDC	NSIDC	252	H	CCW0005354	4/3/00	SUN
00001839	00006771	SUN	n0mos20	2/6/02	I	320-1233-02	9626371388	\$0.00	Keyboard	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	00006772	SUN	n0mos20	2/6/02	I	NE SUN1	LZB64001084	\$0.00	Mouse - 3 Button Track Ball	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009138	SUN	n0mos20	2/6/02	I	370-2040-03	9643547711	\$0.00	Hard Drive - 2.1 GB Internal	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009139	SUN	n0mos20	2/6/02	I	X1025A	11748	\$1,500.00	FDDI SINGLE ATTACH SBUS CARD	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009140	SUN	n0mos20	2/6/02	I	X132P	50126227949 5644	\$0.00	Memory - 32MB RAM Expansion (1x32	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009141	SUN	n0mos20	2/6/02	I	X132P	50126227949 5714	\$0.00	Memory - 32MB RAM Expansion (1x32	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009142	SUN	n0mos20	2/6/02	I	X3500A		\$0.00	Country Kit	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009143	SUN	n0mos20	2/6/02	I	X6001A	9625201087	\$90.00	Floppy Drive - 3.5 IN Disk Drive-1	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009144	SUN	n0mos20	2/6/02	I	X6153A	6Y50C01029	\$240.00	CD ROM - Internal SUNCD 4	NSIDC	NSIDC	252	H	CCW0005354	12/2/96	SUN
00001839	C0009838	SUN	n0mos20	2/6/02	I	370-2286-01	9643604145	\$0.00	Hard Drive - Internal for X5204A	NSIDC	NSIDC	252	H	CCW0005354	12/18/96	SUN
00001839	C0038808	SUN	n0mos20	2/6/02	I	501-2961	017403	\$0.00	System Board	NSIDC	NSIDC	252	H	CCW0005354	4/16/01	SUN
00001839	C0149508	SUN	n0mos20	1/27/99	I	SOLD-C		\$45.00	Solaris Media for Servers	NSIDC	NSIDC	252	S	CCW0005354	12/2/96	SUN

Figure 4.3.4-46. Inventory Report

Report Preview -- ILM-Transaction Log (miami) : ECS Shipping Report

1 of 1    75%    Total:1    100%    1 of 1

Date :2/2/200403: 1:08PM

ECS SHIPPING REPORT  
 Report Period: From 1/12/04 To 1/12/04  
 CONTRACT #NAS5 - 60000

1 of 1

EIN	ECSNAME	MFR	DESCRIPTION	SERIAL NO	FROM	TO	Operator ID
C0001831	CLEBIBM	ATI	10 BASE T TRANSCEIVER		GENC	EDF	ttan

**Figure 4.3.4-47. ECS Shipping Report**

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ECS Quarterly Property Management Report  
 Contractor Acquired Equipment  
 Contract number NAS-60000  
 Period: 4/1/03 to 6/30/03

<u>EIN</u>	<u>MFR</u>	<u>DESCRIPTION</u>	<u>SERIAL NO</u>	<u>LOCATION</u>	<u>COST</u>
C0001851	ATI	10 BASE T TRANSCEIVER		EDFARC	\$39.00
00000999	ATI	10 BASE T TRANSCEIVER		EDF	\$0.00
00000998	ATI	10 BASE T TRANSCEIVER		EDF	\$0.00
C0051060	STK	LC/SC 50M/120U FIBER CABLE		EDF	\$126.00
C0051061	STK	FC 50/ 125 SC-SC DUP 50 MTR		EDF	\$206.00
C0051094	SGI	25M OPT CABLE W/LC/LC CONNETORS		EDF	\$340.56
C0051128	SUN	CABLE ULTRA SCSI-3		EDF	\$152.00
C0051136	MIT	MITSUJI DVD-R		EDF	\$3,175.00
C0051137	MIT	JEWEL CASE ON SIDE		EDF	\$100.00
C0051154	MBS	J-CARD FRONT INSERT 80#		EDF	\$35.00
00030000	SUN	SPARCSTATION 20-71 SX	LKJSDFLJ	EDF	\$4,522.00
CS000046	SUN	CD ROM - INTERNAL SUNCD 2 PLUS	LKEIOLKJASD	EDF	\$555.00
CS000047	SUN	HARD DRIVE - 8.4GB F/W SCSI-2 DESKTOP	ILEJW90ELKJDA	EDF	\$555.00
CS000052	SGI	18GB 10K EXTERNAL HD	1234567890123456789	EDF	\$0.00
CS000053	SGI	18GB 10K EXTERNAL HD	1234567890123456789	EDF	\$0.00
CS000054	SUN	INTERNAL 18.2GB ULTRA SCSI DRIVE	KLJASDJFKLSD56432132	EDF	\$0.00
CS000058	SUN	INTERNAL 18.2GB ULTRA SCSI DRIVE	6523ASD56FDS321SD	EDF	\$0.00
CS000068	IBM	TESTING MWO LJ ADD NEW PART	KLJKJDAIODKL	EDF	\$0.00

The cost of these contractor-acquired equipment for the quarter ending 6/30/03 is: **\$9,805.56**

**Figure 4.3.4-48. Quarterly Property Management Report**

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DATE: 6/30/03 1:28:53PM PURCHASE ORDER COST REPORT Page 1 of 1  
 VENDOR - SGI  
 PO Number - CCL0014185

<u>EIN</u>	<u>PART NUM</u>	<u>DESCRIPTION</u>	<u>SERIAL NO</u>	<u>COST</u>
00020620	WF-600V10-2073	FUEL V10 GRAPHINS 600MEZ	0800691051C4	\$14,054.00
00020621	M-543	MOUSE		\$0.00
00020622	KBB-US	KEYBOARD		\$0.00
C0050414	PCIX-GIGENET-C	1 PORT COPPER GB	HYUR126954	\$511.00
C0050415	PCIX-GIGENET-OR-SU	1 PORT OPT ETHERNET CARD	HYTR126839	\$1,056.00
C0050418	P10-CDR48INT	INTERNAL CD-ROM 40X		\$594.00
C0050419	P10-75G10K-INT	10000RPM INT 3.5 73GB		\$1,584.00
				<b>\$17,799.00</b>

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**Figure 4.3.4-49. Purchase Order Cost Report**

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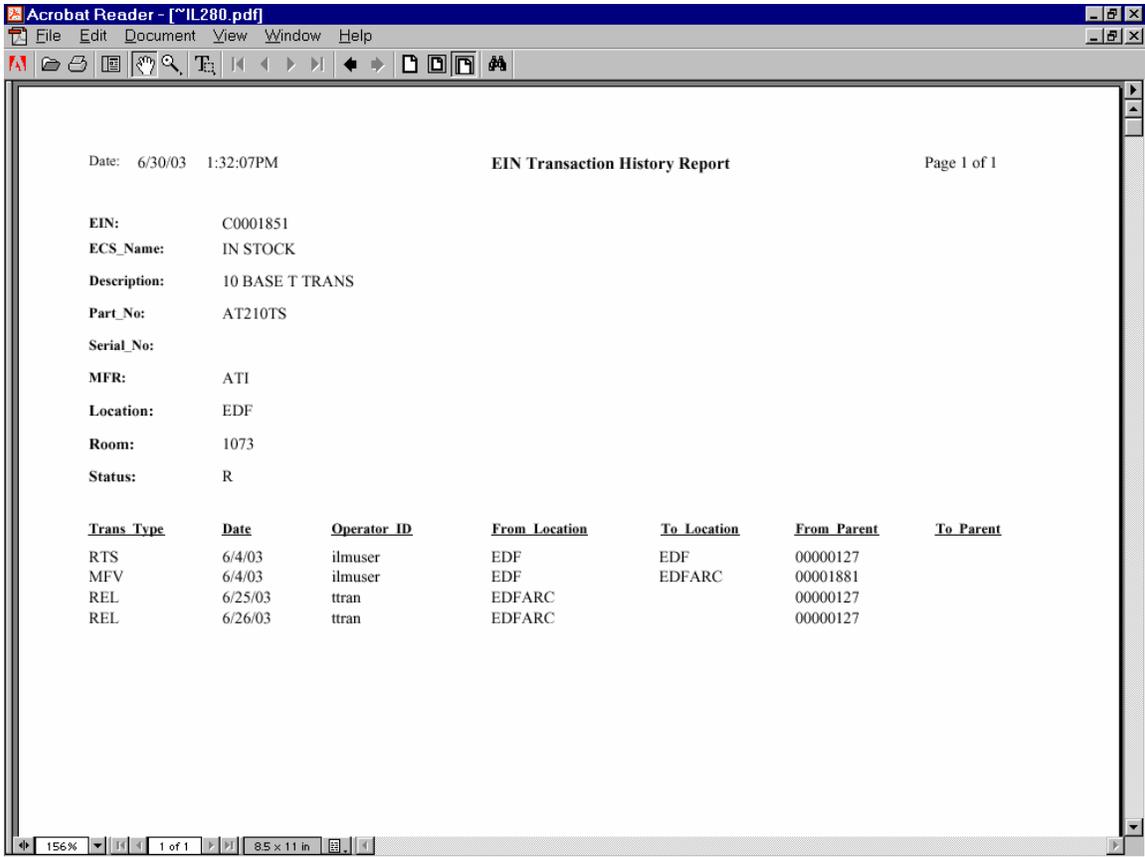
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DATE: 6/30/03                      COST - SELECTED ECS MANAGED PROPERTY                      PAGE:1  
 You can specify the report name here.

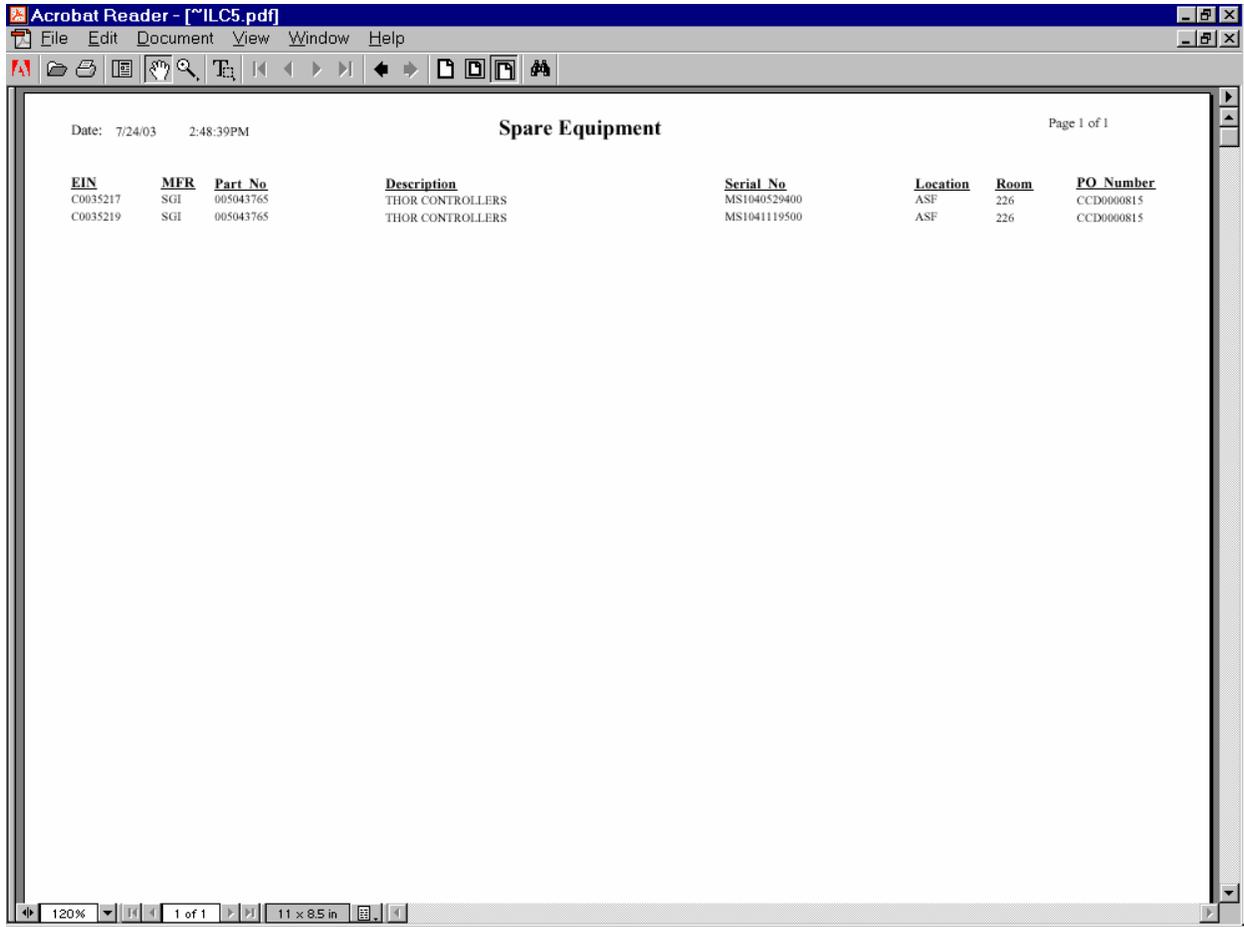
	<u>QTY</u>	<u>COST</u>
Items coded C:(Consumable)	8	\$5,301.00
Items coded H:(Hardware)	12	\$56,453.26
Total:	20	\$61,754.26

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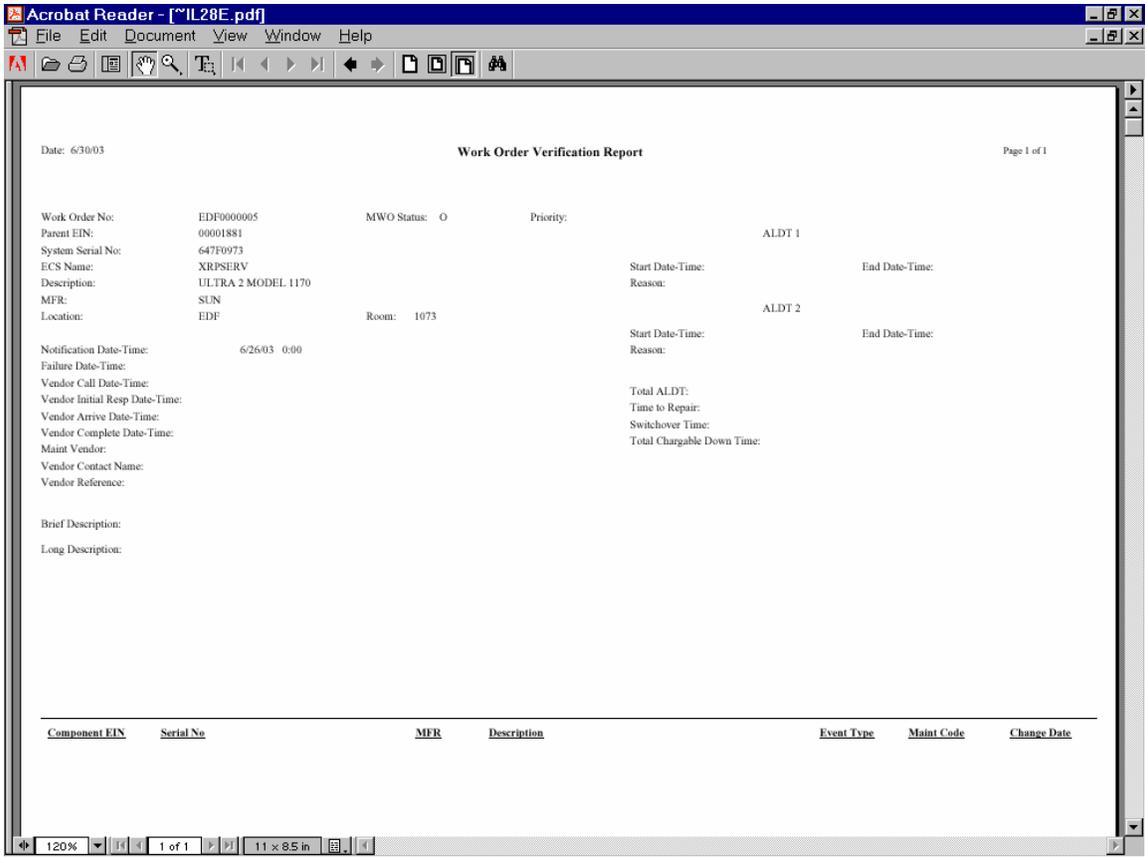
**Figure 4.3.4-50. Cost - Select ECS Managed Property Report**



**Figure 4.3.4-51. EIN Transaction History Report**



**Figure 4.3.4-52. Spare Equipment Report**



**Figure 4.3.4-53. Maintenance Work Order Verification Report**

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Date: 7/25/03 Maintenance Contract Report Page 2 of 7

Contract ID: CCJ14086  
 Maint\_Vendor:  
 Type\_of\_Support: EMOS MAINT  
 Start\_Date: 11/1/02  
 Expiration\_Date: 9/30/04

<u>EIN</u>	<u>ECS_Name</u>	<u>Part_No</u>	<u>Description</u>	<u>Serial_No</u>	<u>Location</u>	<u>PO_Number</u>
0008981	TIGGER	A21UJC1A9P256CP	SUN ULTRA 5 WORKSTATION	FN04520463	EMOSD	CCJ0014086
00009645		A26-UJC2-2GGD1	SERVER - SUN ENTERPRISE 250	124C0C4F	EMOSD	CCJ0014086
00009646		A26-UJC2-1GGB1	SERVER - SUN ENTERPRISE	123C055E	EMOSD	CCJ0014086
00014555		A23ULD29L512AV	SUN ULTRA 60, MODEL 2450	138C0314	EMOSD	CCJ0014086
00014508		AZ1UJC1Z9PC256C	SUN ULTRA 5, MODEL 400	FW13810287	EMOSD	CCJ0014086
00014509		AZ1UJC1Z9PC256C	SUN ULTRA 5, MODEL 400	FW13820105	EMOSD	CCJ0014086
00014511		AZ1UJC1Z9PC256C	SUN ULTRA 5, MODEL 400	FW13740159	EMOSD	CCJ0014086
00011914		AZ1UJC1Z9PC256C	SUN ULTRA 5, MODEL 400	FW13840181	EMOSD	CCJ0014086
00011960		AZ1UJC1Z9PC256C	SUN ULTRA 5, MODEL 400	FW13840233	EMOSD	CCJ0014086
00001991	RAVEN	A11-UAA1-1B-064AB	ULTRA 1 MODEL 140	644F0C01	EMOSD	CCJ0014086
00002395	ecosesparc01	A14-UBA1-1E-064AB	ULTRA 2 MODEL 1170	708F0797	EMOSD	CCJ0014086
00002399	ecosesparc06	A14-UBA1-1E-064AB	ULTRA 2 MODEL 1170	708F079A	EMOSD	CCJ0014086
00003404	r0uss15	A11-UAA1-1A-064AB	ULTRA 1 MODEL 140	719F1431	EMOSD	CCJ0014086
00003405	r0uss16	A11-UAA1-1A-064AB	ULTRA 1 MODEL 140	719F14F2	EMOSD	CCJ0014086

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**Figure 4.3.4-54. Maintenance Contract Report**

Work Order	MFR	DESCRIPTION OF SYSTEM DOWN	SYSTEM NAME	SITE	DATE/TIME Partially/Capable	TOTAL Partially Capable TIME (HRS)	DATE/TIME SYSTEM DOWN	DATE RETURNED TO OPERATION	TOTAL DOWN TIME (HRS)	Restore Time	Problem Description & Solution	Notes
EDC0000509	SGI	RACK SERVER BASIC CHASIS	e0drg12	EDC	10/16/02 9:00		10/16/02 9:00	10/16/02 10:00	1.0	1.0	System board crashed due to bad node board.	Downtime was the result of troubleshooting and repair actions. System took an hour to restore but was operational.
LaR0000269	STK	9940A	STK Powerderhorn silo2	LaRC	10/15/02 8:00	28.0		10/16/02 12:00			Bad drive. Replace drive.	
EDC0000498	STK	Small Communications Rack	e0hippi1	EDC	09/30/02 5:15	224.7		09/30/02 16:00			Bad HIPPI fiber Channel card going to e0drg12.	No Down time associated because Ops had an alternative path GB router.
EDC0000500	SUN	Enterprise 4000 Enclosure 8-Slot Card Ca	e0sps04	EDC	09/09/02 2:45	8.3		09/09/02 11:00			32MB simm had parity errors causing box to reboot.	There are redundandct cpu boards with memory.

**Figure 4.3.4-55. RMA Report**

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Date: 6/30/03 License Entitlement Status Report

**AUTOEXPERT**

LICENSE TYPE	ENT ID	DESCRIPTION	VENDOR	PO Number	MAINT CONTRACT	EXP DATE	USER RTU	URTU REM	USER MNT	NODE RTU	NRTU REM	NRTU MNT
NODELOCK	LE000024	AUTOEXPERT-HIGH AVAILABILITY SERVER OPT					0	0	0	20	19	0
NODELOCK	LE000025	AUTOEXPERT-HIGH AVAILABILITY SERVER OPT					0	0	0	20	19	0

USER RTU - Total User Rights-To-Use purchased.  
 URTU REM - Number of User Rights-To-Use remaining.  
 URTU MNT - Number of User Rights-To-Use having maintenance.  
 NODE RTU - Total Node Rights-To-Use purchased.  
 NODE REM - Number of node Rights-To-Use remaining.  
 NODE MNT - Number of node Rights-To-Use having maintenance.

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**Figure 4.3.4-56. License Entitlements Status Report**

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Date: 6/30/03 1:40:00PM License Allocations By Product Page 1 of 2

CLEARCASE		Version:	Features:			
<u>License ID</u>	<u>Host Name</u>	<u>Host ID</u>	<u>License key</u>	<u>Key Exp Date</u>	<u>Platforms</u>	<u>User RTU</u>
L0000450	t1mss04	807f6113	387d2a2e.01ce9020.02	10/31/02		5
L0000451	n0mss02	8080579b7	387d2a01.03aa6d75.02	10/31/02		10
L0000452	p0mss02	8080bb7	387e702e.79ff1f224.02	10/31/02		2
L0000453	p0mss02	8080bb7	387e7228.528a5aad.02	10/31/02		15
L0000454	p0mss02	8080bb7	387e717b.f4b05dab.02	10/31/02		6
L0000455	p0mss02	8080bb7	387e70be.9600a857.02	10/31/02		5
L0000456	m0mss02	8080fd39	387d28fc.3da6012e.02	10/31/02		1
L0000457	g0mss02	8080e9e8	387d287e.95f02f0b.02	10/31/02		9

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**Figure 4.3.4-57. License Allocations by Product Report**

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DATE: 6/30/03 LICENSE ALLOCATIONS BY HOST REPORT Page 1 of 1

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pl0ps06 ALLOC HOSTID:808041c1

License ID	ECS Alias	Version	Platforms	License Key	Key Exp Date	User RTU
L0000008	AUTOEXPERT		SUN	ECONDSAOTH	12/31/04	
L0000902	AUTOSYS SERVER			EHCRCMILQENPLPGB		
L0000903	AUTOSYS SERVER			ESAHMSGIPPGMMKOH		
L0000899	AUTOSYS CLIENT			EIVJKIMQBUNVFLKNOB		1
L0000900	AUTOEXPERT			ECONTLPGQIQIOHSHQTALMJO		
L0000901	AUTOSYS SERVER			HAQNKPFQKHPHSHGHEQNMNCJ		

120% 1 of 1 11 x 8.5 in

**Figure 4.3.4-58. License Allocations by Host Report**

### 4.3.5 FLEXlm

FLEXlm is a commercially available network license management product that helps EMD staffs at ECS sites administer licenses and enforce licensing provisions for FLEXlm-enabled COTS software. It enforces licensing provisions based on information from vendor-provided license keys and lets license administrators allow, deny, or reserve check out of licenses based on user, host, or display. FLEXlm handles floating (concurrent use) licenses, node locked licenses, and combinations of the two.

FLEXlm processing elements include license manager daemons, vendor daemons, license files, and FLEXlm-enabled applications. One or more license manager daemons control vendor daemon operations and enables client applications to contact them. Vendor daemons grant or deny concurrent use licenses requested by applications, tracking how many are checked out and by which users. License files are text files that contain the provisions for one or more licenses from one or more vendors, including the name of the vendor daemon needed to serve the license and the host(s) to use as license server(s). The applications communicate with the license and vendor daemons using embedded FLEXlm client software to request licenses in order to run.

FLEXlm permits use of single, multiple, or redundant server hosts, and can operate more than one license manager daemon on a given node. A license manager daemon serves all the licenses in the license file it uses, and different license files use separate license manager daemons (distinguished by the port number they use to communicate). In a redundant license server configuration, license manager daemons for a license file are executed on three server nodes such that all licenses in the file are available if any two out of the three server nodes is running. In a multiple license server configuration, licenses are allocated among multiple license files and a separate license manager daemon is run for each file.

Table 4.3.5-1 summarizes the operating functions that FLEXlm supports.

**Table 4.3.5-1. Common ECS Operating Functions Performed with FLEXlm (1 of 2)**

<b>Operating Function</b>	<b>Function Name</b>	<b>Description</b>	<b>When and Why to Use</b>
Start license manager	lmgrd	Starts FLEXlm's main daemon program, which reads the license file and manages vendor daemons and the connections between them and their client applications.	Used to initiate license management server processes.
Stop license manager	lmdown	Shuts down all license daemons (both lmgrd and all vendor daemons) on all nodes.	Used anytime to stop network license activities, such as when the license manager host is to be rebooted.

**Table 4.3.5-1. Common ECS Operating Functions Performed with FLEXlm (2 of 2)**

Operating Function	Function Name	Description	When and Why to Use
Install decimal format licenses	lminstall	Converts licenses between decimal and readable formats and between different versions of FLEXlm license formats.	Used anytime primarily to install decimal format licenses in readable format.
Read new licenses	lmreread	Causes the license servers to reread the license file they are using and start any new vendor daemons.	Used anytime to put the provisions of an updated license file into effect.
Monitor the status of network licensing activities	lmstat	Generates lists containing such information as active licenses, users of licensed product features, users of individual license management daemons, and status of server nodes.	Used anytime to check on the health and functioning of license server daemons, identify licenses installed, determine licenses in use, or review logged licensing events.
Switch to new report log	lmswitchr	Causes the license servers to use a new or different file as the report log.	Not used. Report logs can be read only by the FLEXadmin product. FLEXadmin is not provided in ECS due to security constraints (i.e., use of remote shell utilities).
Verify accuracy of license file	lmcksum	Performs a checksum of a license file.	Used anytime to verify data entry errors in a license file.
Troubleshoot problems serving licenses	lmdiag	Performs problem diagnosis.	Used anytime to help determine why a license cannot be checked out.
Obtain license key from vendor	lmhostid	Reports the hostid of a system.	Used anytime to determine the host code that must be provided to vendors when obtaining a software license.
Recover inaccessible licenses	lmremove	Removes a single user's license for a specified feature.	Used when a client node crashes in order to recover a checked out license not automatically freed.
Determine version compatibility between the license server and an application	lmver	Reports the FLEXlm version of a library of binary files.	Used anytime to determine what version of FLEXlm a FLEXlm-enabled product uses.

#### 4.3.5.1 Quick Start Using FLEXlm

Operators interact with FLEXlm via the license manager daemons and license files. FLEXlm's user interface is a set of Unix-like commands for starting, stopping, and requesting services from

a license manager daemon. Command arguments specify input parameters, most notably the name of the license file whose contents determine the servers, daemons, and license provisions affected by the command. Operators install and maintain license files using any preferred editor.

#### 4.3.5.1.1 Command Line Interface

To start FLEXlm license server daemons in a consistent, predictable manner, execute the following startup script:

```
>/etc/init.d/lmgrd start
```

Before it invokes FLEXlm’s “lmgrd” program, the script adds the extension “.old” to the current FLEXlm log file (if any) so the new daemon will create its own. It then runs “lmgrd” as user “flexlm” to avoid running as “root”, and it specifies the license and log file paths the daemons are to use (i.e., “/usr/local/flexlm/licenses/license.dat” and “/tmp/license\_log”, respectively).

If license manager daemons are needed to serve licenses in additional license files, they can be started by running the “lmgrd” program as follow:

```
>su flexlm -c /etc/opt/licenses/lmgrd.ste -c license_file -l logfile -2 -p & (SUNs only)
```

```
>su flexlm -c /etc/opt/licenses/lmgrd -c license_file -l logfile -2 -p & (SGIs only)
```

To stop the FLEXlm license daemons that are running on all machines in the network, execute the FLEXlm command:

```
lmdown
```

However, to shut down the license manager daemons on a single machine only, log on to the machine and type the following command instead:

```
>/etc/init.d/lmgrd stop
```

Table 4.3.5-2 summarizes commands available with FLEXlm. See the *FLEXlm End User’s Manual* for the complete description of each command and its arguments.

**Table 4.3.5-2. Command Line Interfaces (1 of 2)**

Command Line Interface	Description and Format	When and Why Used
lmcksum	lmcksum [-c license_file]	To verify license file data.
lmdiag	lmdiag [-c license_file] \ [-n] [feature]	To diagnose problems when a license cannot be checked out.

**Table 4.3.5-2. Command Line Interfaces (2 of 2)**

Command Line Interface	Description and Format	When and Why Used
Imdown	Imdown [-c <i>license_file</i> ] [-q]	To shutdown all license daemons (both Imgrd and all vendor daemons) on all nodes.
Imgrd (SGI) Imgrd.ste (Sun)	Imgrd [ -app ] [ -c <i>license_file</i> ] \ [ -t <i>timeout_interval</i> ] [ -l <i>logfile</i> ] \ [ -s <i>timestamp_interval</i> ] [ -2 -p ] [ -v ] \ [ -x Imdown ] [ -x Imremove ]	To run the main daemon program for FLEXlm.
Imhostid	Imhostid [-n]	To determine the hostid of a system.
Iminstall	Iminstall [ -i { <i>infile</i>   -} ] [ -o <i>outfile</i> ] \ [ -overfmt {2   3   4   5   5.1   6} ] \ [ -odecimal ]	To convert licenses between decimal and readable formats and between different versions of FLEXlm formats.
Imremove	Imremove [ -c <i>file</i> ] <i>feature user host</i> \ <i>display</i>  <u>or</u>  Imremove [ -c <i>file</i> ] -h <i>feature host</i> \ <i>port handle</i>	To remove a single user's license for a specified feature. (This is only needed when a client node crashes, since that's the only condition where a license is not automatically freed. If the application is active, it checks out the license again after it is freed by Imremove.)
Imreread	Imreread [-c <i>license_file</i> ] \ [- <i>vendor name</i> ]	To cause the license daemon to reread the license file and start any new vendor daemons that have been added. In addition, one or all pre-existing daemons are signaled to reread the license file for changes in feature licensing information.
Imswitchr	Imswitchr [ -c <i>license file</i> ] <i>feature</i> \ <i>new-file</i>  <u>or</u>  Imswitchr [ -c <i>license file</i> ] <i>vendor</i> \ <i>new-file</i> ( <i>v5.0+ onl</i> )	To start recording license events in a new or different log file for the FLEXadmin tool.
Imstat	Imstat [-a] [-A] [ -c <i>license_file</i> ] \ [ -f <i>feature</i> ] [ -i [ <i>feature</i> ] ] \ [ -S <i>vendor</i> ] [ -s <i>hostname</i> ] \ [ -t <i>value</i> ]	To report the status of all network licensing activities.
Imver	Imver <i>filename</i>	To identify the FLEXlm version of a library or binary file.

#### 4.3.5.2 FLEXlm Main Screen

FLEXlm does not provide for operator interaction via a GUI. All interactions are through the Unix command line or a Unix script.

#### 4.3.5.3 Required Operating Environment

For all COTS packages, appropriate information on operating environments, tunable parameters, environment variables, and a list of vendor documentation can be found in a CM-controlled document for each product. To find the installation and release notes for FLEXlm, refer to the ECS Baseline Information System web page, URL <http://cmdm.east.hitc.com/>.

#### 4.3.5.4 Databases

FLEXlm uses license and options files in lieu of a database. License files are independent text files, each of which contains all the site-specific information FLEXlm needs to serve the licenses specified in the file. Every license manager daemon requires a license file, and different license files require separate license manager daemons. To simplify operations, operators may combine license files obtained from multiple vendors if they are compatible. Refer to the *FLEXlm End User's Manual* for information about the format of a license file, and when and how to combine them.

Options files are text files associated with specific vendor daemons named in license files. These files allow the operator to specify criteria for granting licenses to users, wait time before reclaiming inactive licenses, and how much license usage information is to be logged. FLEXlm does not require an options file. When specified however, there can only be one options file per vendor daemon, and each vendor needs a separate options file. See the *FLEXlm End User's Manual* for details.

#### 4.3.5.5 Special Constraints

FLEXlm cannot be run without one or more license files, and most FLEXlm commands require the name of a license file in order to execute. License files identify the host and port number a client is to use to communicate with the license server. If the license file parameter is missing from the command, FLEXlm tries using the file(s) named in the environment variable `LM_LICENSE_FILE`. If `LM_LICENSE_FILE` is not set, the default license file name `/usr/local/flexlm/licenses/license.dat` is assumed.

The *FLEXlm End User's Manual* recommends the following operating constraints:

- Keep a copy or link of the license file in the vendor's "default" location; some vendors expect to find their license files at pre-determined locations. Refer to the *FLEXlm End User's Manual*.
- Run `lmgrd` as a non-privileged user (not `root`) to avoid security risks. Refer to the *FLEXlm End User's Manual*

#### 4.3.5.6 Outputs

FLEXlm's principal outputs are inter-process communications with COTS applications attempting to check out and check in FLEXlm licenses, but these are generally transparent to the

operator. Outputs visible to the operator include an ASCII log of network licensing events and errors, and messages constituting responses to operator-entered commands.

### 4.3.5.7 Event and Error Messages

FLEXlm writes both status and error messages to standard output. Typically, operators redirect all output from the startup command “lmgrd” to a file, known as the debug file, to create a FLEXlm log at the site.

See the appendices of the *FLEXlm End User’s Manual* lists what causes the more common messages an operator may encounter, but primarily those written by the FLEXlm programs. Event and error messages logged by FLEXlm-enabled COTS applications are sometimes found in the application’s manuals. Messages are typically self-explanatory and identify the date/time of the event, the license server host, the product or feature involved, and the name of the user.

### 4.3.5.8 Reports

FLEXlm’s *lmstat* utility can generate the status reports listed in Table 4.3.5-3. Each is written to standard output and may be redirected to a named file or a printer using standard Unix conventions. Reports are generated on demand as required to meet operational needs.

**Table 4.3.5-3. Reports**

Report Type	Report Description	Example
lmstat -s	Lists status of clients running on a named host.	Figure 4.3.5-1
lmstat -i	Lists license information about all or a named feature.	Figure 4.3.5-2
lmstat -a	Lists all information about current network licensing activities.	Figure 4.3.5-3
lmstat -A	Lists all currently active licenses.	Figure 4.3.5-4
lmstat -f	Lists users of all or a named feature.	Figure 4.3.5-5
lmstat -S	Lists users of all or a named vendor’s features.	Figure 4.3.5-6

**Note:** FLEXlm documentation refers to a report log and a set of license administration reports associated with a companion product, *FLEXadmin*. *FLEXadmin* is not part of the ECS deployment. *lmstat* does not use the “report log” and does not produce *FLEXadmin* reports.

#### 4.3.5.8.1 Sample Reports

The figures (Figure 4.3.5-1 through 4.3.5-6) that follow contain sample FLEXlm status reports. One sample is provided for each report listed in Table 4.3.5-3.

```
lmstat - Copyright (C) 1989-2001 Globetrotter Software, Inc.
Flexible License Manager status on Wed 1/28/2004 14:33

License server status: 1726@p0css02,1726@p0mss07,1726@p0mss10
License file(s) on p0css02: /usr/local/flexlm/licenses/license.dat:

p0css02: license server UP v8.0
p0mss07: license server UP (MASTER) v8.0
p0mss10: license server UP v8.0

Vendor daemon status (on p0mss07):

suntechd: UP v4.1
sunwlicd: UP v7.0
  ICSBX: Cannot read data from license server (-16,287)
idl_lmgrd: UP v6.1
rational: UP v7.0
```

**Figure 4.3.5-1. All Clients (lmstat -s) Report**

lmstat - Copyright (C) 1989-2001 Globetrotter Software, Inc.  
 Flexible License Manager status on Wed 1/28/2004 14:37

NOTE: lmstat -i does not give information from the server,  
 but only reads the license file. For this reason,  
 lmstat -a is recommended instead.

Feature	Version#	licenses	Expires	Vendor
sunpro.c	4.200	1	01-jan-0	suntechd
sunpro.cc	4.200	1	01-jan-0	suntechd
sunpro.sparcworks.tools	4.000	1	01-jan-0	suntechd
sunpro.sw_teamware	2.000	1	01-jan-0	suntechd
sunpro.mpmt	3.100	1	01-jan-0	suntechd
sunpro.visu	2.000	1	01-jan-0	suntechd
sunpro.f77	4.200	1	01-jan-0	suntechd
sunpro.f90	1.200	1	01-jan-0	suntechd
sunpro.perf	1.200	1	01-jan-0	suntechd
workshop.c.sparc	6.000	4	01-jan-0	sunwlicd
workshop.cc.sparc	6.000	4	01-jan-0	sunwlicd
workshop.visu.sparc	6.000	4	01-jan-0	sunwlicd
workshop.dbx.sparc	6.000	4	01-jan-0	sunwlicd
workshop.mpmt.sparc	6.000	4	01-jan-0	sunwlicd
workshop.teamware.sparc	6.000	4	01-jan-0	sunwlicd
workshop.tools.sparc	6.000	4	01-jan-0	sunwlicd
workshop.f77.sparc	6.000	4	01-jan-0	sunwlicd
workshop.f90.sparc	6.000	4	01-jan-0	sunwlicd
DatabaseXcessory	1.000	1	01-jan-00	ICSBX
BuilderXcessory	5.000	1	01-jan-00	ICSBX
idl_drawx	1.000	6	1-jan-0000	idl_lmgrd
insight	2.000	6	1-jan-0000	idl_lmgrd
idl	5.500	60	1-jan-0000	idl_lmgrd
ddts	4.100	5	01-jan-00	rational
PurifyPlusUNIX	5.0	3	31-dec-2003	rational

**Figure 4.3.5-2. License Information (lmstat -i) Report**

```

Flexible License Manager status on Wed 1/28/2004 14:34
License server status: 1726@p0css02,1726@p0mss07,1726@p0mss10
  License file(s) on p0css02: /usr/local/flexlm/licenses/license.dat:

  p0css02: license server UP v8.0
  p0mss07: license server UP (MASTER) v8.0
  p0mss10: license server UP v8.0
Vendor daemon status (on p0mss07):

  suntechd: UP v4.1
  sunwlicd: UP v7.0
  ICSBX: Cannot read data from license server (-16,287)
  idl_lmgrd: UP v6.1
  rational: UP v7.0
Feature usage info:
Users of sunpro.c: (Total of 1 license available)
Users of sunpro.cc: (Total of 1 license available)
Users of sunpro.sparcworks.tools: (Total of 1 license available)
Users of sunpro.sw_teamware: (Total of 1 license available)
Users of sunpro.mpmt: (Total of 1 license available)
Users of sunpro.visu: (Total of 1 license available)
Users of sunpro.f77: (Total of 1 license available)
Users of sunpro.f90: (Total of 1 license available)
Users of sunpro.perf: (Total of 1 license available)
Users of workshop.c.sparc: (Total of 4 licenses available)
Users of workshop.cc.sparc: (Total of 4 licenses available)
Users of workshop.visu.sparc: (Total of 4 licenses available)
Users of workshop.dbx.sparc: (Total of 4 licenses available)
Users of workshop.mpmt.sparc: (Total of 4 licenses available)
Users of workshop.teamware.sparc: (Total of 4 licenses available)
Users of workshop.tools.sparc: (Total of 4 licenses available)
Users of workshop.f77.sparc: (Total of 4 licenses available)
Users of workshop.f90.sparc: (Total of 4 licenses available)
Users of ddts: (Total of 5 licenses available)

      .
      .
      .

```

**Figure 4.3.5-3. All Licensing Activities (lmstat -a) Report**

```

lmstat - Copyright (C) 1989-1997 Globetrotter Software, Inc.
Flexible License Manager status on Fri 1/30/2004 08:37

License server status: 1744@jupi,1744@enterprise,1744@intrepid
License file(s) on jupi: /usr/local/flexlm/licenses/license.dat:

    jupi: license server UP (MASTER) v8.0
enterprise: license server UP v8.0
intrepid: license server UP v8.0

Vendor daemon status (on jupi):

    xnidaem: UP v6.0
        IDE: UP v4.1
    rational: UP v7.0
        setechd: UP v6.1
    idl_lmgrd: UP v6.1
        ICSBX: The desired vendor daemon is down (-97,380)
    ncdlmd: UP v4.1
    dmccabe: UP v5.11
    suntechd: UP v4.1
    cayenne: UP v5.12
        VNI: UP v6.1
    sunwlicd: UP v7.0

Feature usage info:

Users of ddts: (Total of 17 licenses available)

    "ddts" v4.100, vendor: rational
    floating license

adupree xserv02 /dev/pts/257 (v4.1) (jupi/1744 591), start Fri 1/30 8:18
jrattiga xserv01 /dev/pts/114 (v4.1) (jupi/1744 1073), start Fri 1/30 8:34

Users of BuilderXcessory: Cannot get users of BuilderXcessory: No such feature exists (-5,222)
Users of DatabaseXcessory: Cannot get users of DatabaseXcessory: No such feature exists (-5,222)

```

**Figure 4.3.5-4. All Active Licenses (Imstat-A) Report**

```

lmstat - Copyright (C) 1989-1997 Globetrotter Software, Inc.
Flexible License Manager status on Fri 1/30/2004 08:48

License server status: 1744@jupi,1744@enterprise,1744@intrepid
  License file(s) on jupi: /usr/local/flexlm/licenses/license.dat:

    jupi: license server UP (MASTER) v8.0
enterprise: license server UP v8.0
  intrepid: license server UP v8.0

Vendor daemon status (on jupi):

  xnidaem: UP v6.0
    IDE: UP v4.1
rational: UP v7.0
  setechd: UP v6.1
idl_lmgrd: UP v6.1
  ICSEBX: The desired vendor daemon is down (-97,380)
  ncdlmd: UP v4.1
  dmccabe: UP v5.11
  suntechd: UP v4.1
  cayenne: UP v5.12
    VNI: UP v6.1
  sunwlicd: UP v7.0

Feature usage info:

Users of ada.sun4: (Total of 30 licenses available)

Users of ddts: (Total of 17 licenses available)

  "ddts" v4.100, vendor: rational
floating license

jrattiga xserv01 /dev/pts/l14 (v4.1) (jupi/1744 1073), start Fri 1/30 8:34
zyu xserv01 /dev/pts/205 (v4.1) (jupi/1744 592), start Fri 1/30 8:46

Users of PurifyPlusUNIX: (Error: 10 licenses, unsupported by licensed server)

Users of workshop.teamware.sparc: (Total of 15 licenses available)

Users of workshop.tools.sparc: (Total of 15 licenses available)

Users of workshop.f77.sparc: (Total of 15 licenses available)

Users of workshop.f90.sparc: (Total of 15 licenses available)

.
.
.

```

**Figure 4.3.5-5. Users of All or Named Features (lmstat-f) Report**

```
lmstat - Copyright (C) 1989-1997 Globetrotter Software, Inc.
Flexible License Manager status on Fri 1/30/2004 08:50

Feature usage info:

Users of ada.sun4: (Total of 30 licenses available)

Users of ddts: (Total of 17 licenses available)

    "ddts" v4.100, vendor: rational
    floating license

jrattiga xserv01 /dev/pts/l14 (v4.1) (jupi/1744 1073), start Fri 1/30 8:34
zyu xserv01 /dev/pts/205 (v4.1) (jupi/1744 592), start Fri 1/30 8:46
aadekunj xserv01 /dev/pts/l34 (v4.1) (jupi/1744 951), start Fri 1/30 8:50

Users of PurifyPlusUNIX: (Error: 10 licenses, unsupported by licensed server)

Users of workshop.f77.sparc: (Total of 15 licenses available)

Users of workshop.f90.sparc: (Total of 15 licenses available)

    .
    .
    .
```

**Figure 4.3.5-6. Users of All or Named Vendor's Features (lmstat-S) Report**

### 4.3.6 Remedy's Action Request System

The Remedy Action Request System (ARS) provides a distributed Trouble Ticketing Service that furnishes DAACs a common environment and the means of classifying, tracking, and reporting problem occurrences and resolutions to both EMD users and operations personnel. The Trouble Ticketing Service:

- Provides a GUI for operations personnel to access all Trouble Ticket services
- Provide a common Trouble Ticket entry format
- Stores Trouble Tickets
- Retrieves Trouble Tickets via ad-hoc queries
- Allows operations personnel to forward problem information from one DAAC to the SMC or to another DAAC
- Generates reports and statistics
- Interfaces with user's and operator's e-mail to provide automatic notification
- Offers an application programming interface through which applications can submit Trouble Tickets
- Provides summary information to the SMC from each DAAC to allow trend reports regarding Trouble Tickets
- Defines a consistent "life-cycle" for Trouble Tickets
- Allows each DAAC a degree of customization through definition of further escalation and action rules.

Escalation rules are time-activated events executed on Trouble Tickets meeting a set of specified criteria. Actions taken can include notification (either a user or support staff member), writing to a log file, setting a field value on the Trouble Ticket, or even running a custom designed process. Qualifications can be expressed on any Trouble Ticket data tracks. Active links are similar to escalation rules with the exception that they are defined to take place on a specified action rather than at a given time.

In addition, a Web view of the Trouble Ticket form is set up to enable submission of new Trouble Tickets and to query the current status of trouble tickets via a Web browser. Access to the Trouble Ticketing system through this technique provides users an easy method for reporting problems in an environment already familiar to them. Additionally, as another means of Trouble Ticket entry, the Trouble Ticket services provide a text e-mail template through which automated entry of Trouble Tickets is possible. Support staff members enter Trouble Tickets through the Remedy's Action Request System provided interface for problems received via other methods (e.g., phone calls).

In addition to tracking Trouble Tickets, the Remedy Action Request System also functions as the User Contact Log. Remedy's Action Request System is configured to have a separate form containing the entries User Services personnel enter for each contact they have with a user. A user contact log allows a Trouble Ticket to be initiated from a log entry with the push of a button. The Trouble Ticket is populated with information from the contact log.

User Services and other operations personnel use Remedy's Action Request System to perform the functions listed in Table 4.3.6-1.

**Table 4.3.6-1. Common ECS Operating Functions Performed with Remedy's Action Request System (1 of 4)**

Operating Function	GUI (Section)	Description	When and Why to Use
Access Trouble Ticket services	User Tool (4.3.6.2)	<ul style="list-style-type: none"> <li>• Accessed by executing the User Tool and opening a new RelB-Trouble Tickets form</li> <li>• Main Remedy Trouble Ticket screen used for submitting, modifying, or displaying a Trouble Ticket.</li> </ul>	When there is a need to submit, query, or revise a Trouble Ticket
Submit a Trouble Ticket	User Tool (RelB-Trouble Tickets form) (4.3.6.2)	<ul style="list-style-type: none"> <li>• Submitted by executing the User Tool and opening a <u>new</u> RelB-Trouble Tickets form</li> <li>• Trouble Ticket form is used to enter information about the problem</li> </ul>	When a problem is either found by or reported to User Services
Retrieve a Trouble Ticket	User Tool (RelB-Trouble Tickets form) (4.3.6.2)	<ul style="list-style-type: none"> <li>• Retrieved by executing the User Tool and opening a RelB-Trouble Tickets form in Search mode</li> <li>• Allows entry of new information about the problem</li> </ul>	When information needs to be added to a trouble ticket or when a trouble ticket needs to be viewed
Forward a Trouble Ticket to the SMC and/or another DAAC	User Tool (RelB-Trouble Ticket, RelB-TT-ForwardToSite and RelB-TT-Sites form) (4.3.6.2)	<ul style="list-style-type: none"> <li>• Forwarded by executing the User Tool and opening RelB-Trouble Ticket form</li> <li>• The Forward-To field contains a drop-down menu for the selection of a forwarding destination.</li> <li>• Forwarded information is supported and held by the RelB-TT-ForwardToSite form</li> <li>• The RelB-TT-Sites form supplies the site name and email address to be used in the forwarding</li> </ul>	When a Trouble Ticket is deemed relevant to another site

**Table 4.3.6-1. Common ECS Operating Functions Performed with Remedy's Action Request System (2 of 4)**

Operating Function	GUI (Section)	Description	When and Why to Use
Generate reports	User Tool (RelB-Trouble Tickets form) (4.3.6.2)	<ul style="list-style-type: none"> <li>• Generated by executing the User Tool and opening RelB-Trouble Tickets form</li> <li>• Reports can be created and run by either selecting Report button in the tool bar or by selecting Tools -&gt; Reporting from the main menu.</li> </ul>	When information is needed about one or more Trouble Tickets
Add, delete, or modify user accounts	User Tool (RelB-User form) (4.3.6.2.1)	<ul style="list-style-type: none"> <li>• Added, Deleted, or Modified by executing the User Tool and opening a RelB-User form in new or search mode.</li> <li>• RelB-User form contains key information about a user account</li> </ul>	When there is a need to add new Remedy users, delete old users, or modify old users
Create/Update User Contact Log entry and submit a Trouble Ticket from a log entry	User Tool (Contact Log form) (4.3.6.2.2)	<ul style="list-style-type: none"> <li>• Done by executing the User Tool and opening a RelB-Contact Log form</li> <li>• Used to classify, track, and report contacts of ECS users and operators.</li> </ul>	When there is a need to record user contacts and generate Trouble Tickets
Provide a description of a hardware problem that corresponds to a Trouble Ticket	User Tool (Hardware Information form) (4.3.6.2.3)	<ul style="list-style-type: none"> <li>• Provided by executing the User Tool and opening a RelB-Hardware Information form, or by selecting the Hardware Information link from the Trouble Tickets form</li> <li>• Screen used to enter detailed information about failed hardware components (e.g., part and serial numbers) and the actions taken to correct the problem</li> </ul>	When detailed hardware information needs to be provided beyond what can be entered on the Trouble Tickets form

**Table 4.3.6-1. Common ECS Operating Functions Performed with Remedy's Action Request System (3 of 4)**

Operating Function	GUI (Section)	Description	When and Why to Use
Customize pulldown menus on RelB-Trouble Tickets form	User Tool (RelB-Menu-Closing Codes, RelB-Menu-Hardware Resources, RelB-Menu-Software Resources, RelB-Menu-Key Words, RelB-Menu-Problem Type, form) (4.3.6.2.4-4.3.6.2.8)	<ul style="list-style-type: none"> <li>• Customized by executing the User Tool and opening: RelB-Menu-Closing Codes, RelB-Menu-Hardware Resources, RelB-Menu-Software Resources, RelB-Menu-Key Words, RelB-Menu-Problem Type, and Sites forms</li> <li>• Pick list items can be added, deleted, or modified from these forms</li> </ul>	When current menu is inadequate
Add, delete, modify a site name and email address	User Tool (RelB-TT-Sites form) (4.3.6.2.9)	<ul style="list-style-type: none"> <li>• Added, deleted, or modified by executing the User Tool and opening RelB-TT-Sites form</li> <li>• Provides a picklist of sites (DAACs), SMC, NISN, and EMSn</li> </ul>	When there is a need to add, delete, or modify the site name and email address information that is used in forwarding
Notification and/or customization at different states of a Trouble Ticket	Admin Tool and User Tool (RelB-TT-Times form) (4.3.6.2.10 & 4.3.6.2.11)	<ul style="list-style-type: none"> <li>• Accessed by executing the AdminTool to open the correct filter, escalation, or active link</li> <li>• Accessed by clicking on User Tool icon and opening RelB-TT-Times form to review/modify the time that a specified person/group is to be notified of a change in a trouble ticket's status</li> </ul>	To notify someone or set fields as soon as a Trouble Ticket reaches a particular state or if a Trouble Ticket is in a particular state too long
Notify the user of a Remedy event	Notification Tool (4.3.6.2.12)	<ul style="list-style-type: none"> <li>• Notify by executing the Remedy Notification Tool</li> <li>• Allows properties and options to be modified via pull-down menus</li> </ul>	When there is a need for an alternative to email notification

**Table 4.3.6-1. Common ECS Operating Functions Performed with Remedy's Action Request System (4 of 4)**

Operating Function	GUI (Section)	Description	When and Why to Use
Import entries into a particular form	Import Tool (4.3.6.2.13)	<ul style="list-style-type: none"> <li>Imported by executing the Remedy Import Tool</li> <li>Enables the user to import entries into a form from a file generated by the Admin tool</li> </ul>	When there is a need to import existing entries rather than retyping information manually
Submit a Trouble Ticket query trouble tickets via the Trouble Ticket Web view.	Trouble Ticket Web view (4.3.6.2.14)	<ul style="list-style-type: none"> <li>Submitted by opening the Trouble Ticket form in a Web browser</li> <li>Submit, obtain a list and view details of Trouble Tickets</li> </ul>	When there is a need to submit Trouble Tickets or query for trouble tickets and a Remedy PC/Unix user tool client is not available.

#### 4.3.6.1 Quick Start Using Remedy's Action Request System

This section describes how to invoke Remedy and provides a description of customized Remedy GUIs. Standard Remedy features (e.g., pull-down menus) are not discussed in this document. For more information on Remedy's Action Request System, refer to the following:

- *Remedy's Action Request Concepts Guide version 5.1.2*, Chapter 1 "Overview," page 1-1
- *Remedy's Action Request System version 5.1.2 Help menu on the Remedy client's toolbar.*
- For information on the fields of the GUIs shown in this section, use the Context Sensitive Help available for that GUI.

The documentation of Remedy AR System used as a basis and referenced in this section is for version 5.1.2.

##### 4.3.6.1.1 Invoking Remedy's Action Request System

In Remedy ARS 5.1.2, all of the 5.1.2 clients (user tool, admin tool, import, license, etc.) are Microsoft Windows (Windows 2000, Windows XP Professional) based clients. To execute the Remedy 5.1.2 clients on the PC, click Start -> Programs -> Action Request System -> and then select one of the following; [AR System User, AR System Administrator, AR System Import, etc.].

The Remedy ARS 4.5.1 UNIX User tool can also be used to access the Remedy ARS 5.1.2 server. The command to execute the Remedy UNIX User Tool from the command line in an X-window is: \$ /usr/ecs/OPS/COTS/remedy452/aruser.

For more information on the names and locations of configuration and option files in the AR System installation for Windows, contact your Remedy administrator or refer to the *Action Request System 5.1 Configuring AR System manual*.

### 4.3.6.2 Remedy's PC User Tool (RelB-Trouble Tickets Form)

Remedy's Action Request System PC User Tool's display of the RelB-Trouble Tickets Form GUI is shown in Figure 4.3.6-1. From here Trouble Tickets can be submitted, queried, modified, or forwarded. Note that the Unix User tool GUI is similar to the PC GUI with the exception that the Unix client does not have a "Print Preview" or "Record/Cancel macro" icon on its toolbar.

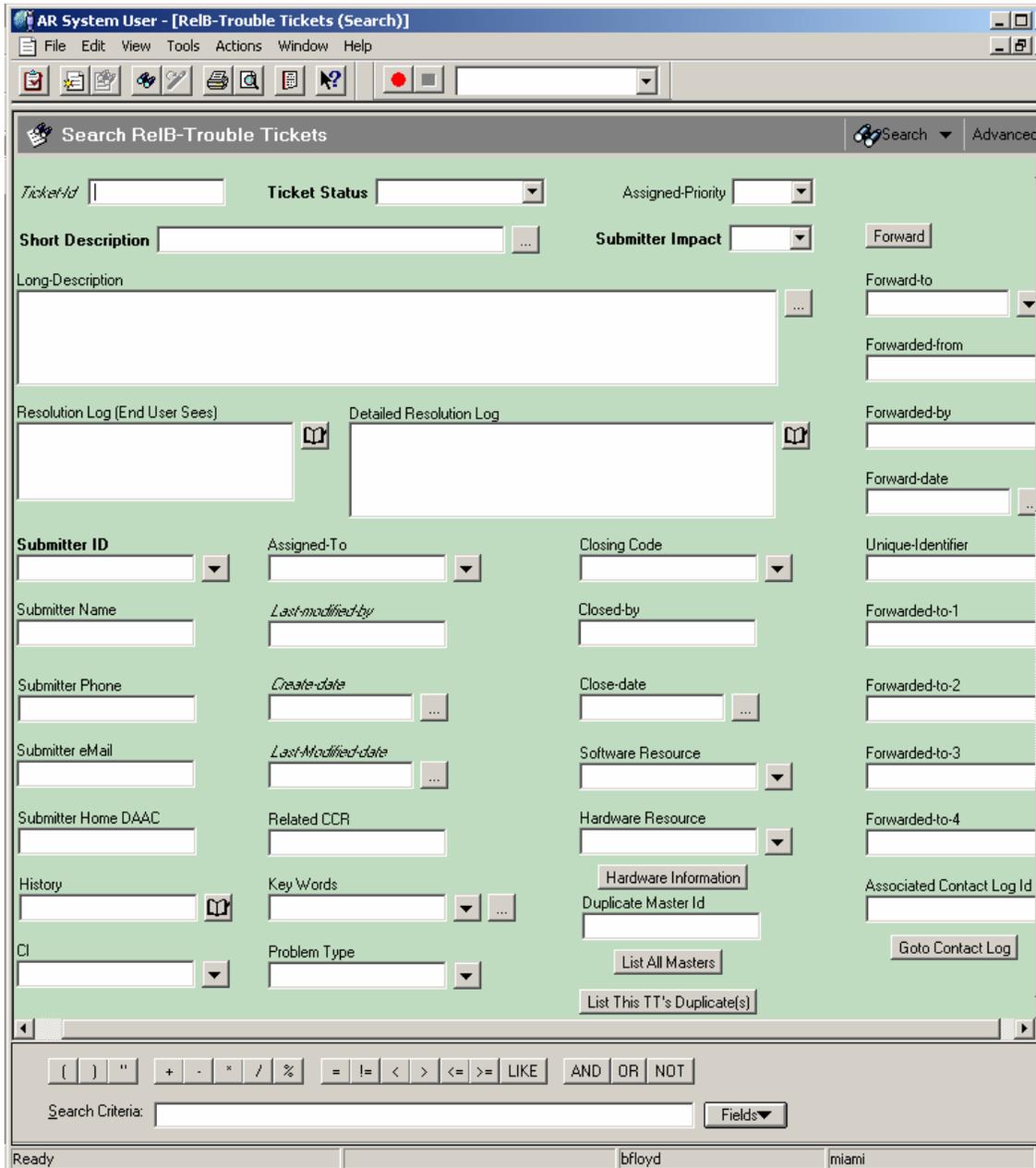


Figure 4.3.6-1. RelB-Trouble Tickets Form GUI

Table 4.3.6-2 provides a description of the RelB-Trouble Tickets Form fields.

**Table 4.3.6-2. RelB-Trouble Tickets Field Descriptions (1 of 3)**

Field Name	Data Type	Size	Entry	Description
Ticket-Id	Character	15	System generated	Ticket number, which is set and maintained by the system.
Ticket Status	Selection	*	Required	Status of the Trouble Ticket.
Assigned-Priority	Selection	*	Optional	Priority of Trouble Ticket assigned at the site.
Short Description	Character	128	Required	Short Description of the problem.
Submitter Impact	Selection	*	Required	Impact of the problem to the submitter.
Long-Description	Character	4060	Optional	Long Description of the problem.
Resolution Log (End User Sees)	Diary	Unlim	Optional	General steps in the resolution of the problem.
Detailed Resolution Log	Diary	Unlim	Optional	Detailed steps in problem resolution.
Submitter ID	Character	30	Required	User Id of the Submitter.
Submitter Name	Character	30	Optional	Full Name of the Submitter.
Submitter Phone	Character	30	Optional	Phone number of the Submitter.
Submitter eMail	Character	64	Optional	E-mail address of the Submitter.
Submitter Home DAAC	Character	60	Optional	Home DAAC of the Submitter.
History	Diary	Unlim	Optional	<ul style="list-style-type: none"> <li>• Upon submission or modification, the person assigned to the ticket and the ticket status are indicated in the History field</li> <li>• Due to a limitation in Remedy, this information is only written when the Assigned-to and Status fields are modified</li> </ul>
CI	Character	30	Optional	Name of the configuration item to which the problem is associated.
Assigned-To	Character	30	Optional	Person who Trouble Ticket has been assigned to.
Last-modified-by	Character	30	System generated	Person who last modified the Trouble Ticket.
Create-date	Date/Time	17	System generated	Date and time Trouble Ticket was created at the present site (mm/dd/yy hh:mm:ss).
Last-Modified-date	Date/Time	17	System generated	Date and time the Trouble Ticket was last modified (mm/dd/yy hh:mm:ss).

\* Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

**Table 4.3.6-2. ReIB-Trouble Tickets Field Descriptions (2 of 3)**

Field Name	Data Type	Size	Entry	Description
Related CCR	Character	60	Optional	ID of a related CCR or CCRs. [if more than one CCR, separate CCRs by a space for readability].
Key Words	Character	255	Optional	Key words to help identify this Trouble Ticket (e.g., Hardware, Software, Configuration).
Problem Type	Character	30	Optional	Type of problem addressed by this Trouble Ticket (e.g., Configuration Error, Hardware Problem, Software Problem).
Closing Code	Character	60	Optional	Code assigned to the type of problem necessitating the writing of this Trouble Ticket.
Closed-by	Character	60	Optional	Person that closed this Trouble Ticket.
Close-date	Date/Time	17	Optional	Date and time this Trouble Ticket was closed. (mm/dd/yy hh:mm:ss)
Software Resource	Character	60	Optional	Software Resource the problem came from.
Hardware Resource	Character	60	Optional	Hardware Resource the problem came from.
Duplicate Master Id	Character	25	Optional	The Ticket-ID of the primary Trouble Ticket for the problem reported in this trouble ticket and its associated duplicate trouble tickets (other tickets reporting the same problem).
Forward-to	Character	60	Optional	Site this Trouble Ticket was last forwarded to.
Forwarded-from	Character	60	Optional	Site that forwarded this Trouble Ticket.
Forwarded-by	Character	60	Optional	Contact person at the forwarding site.
Forward-date	Date/Time	17	Optional	Date and time Trouble Ticket was forwarded. (mm/dd/yy hh:mm:ss)
Unique-Identifier	Character	20	Optional	<ul style="list-style-type: none"> <li>• Unique identifier which is established at the origination site</li> <li>• This identifier should NEVER be changed once set</li> </ul>
Forwarded-to-1	Character	60	Optional	First site to have been forwarded this Trouble Ticket.

**Table 4.3.6-2. RelB-Trouble Tickets Field Descriptions (3 of 3)**

Field Name	Data Type	Size	Entry	Description
Forwarded-to-2	Character	60	Optional	Second site to have been forwarded this Trouble Ticket.
Forwarded-to-3	Character	60	Optional	Third site to have been forwarded this Trouble Ticket.
Forwarded-to-4	Character	60	Optional	Fourth site to have been forwarded this Trouble Ticket.
Associated Contact Log Id	Character	30	Optional	ID number of the Associated Contact Log entry for this trouble ticket.

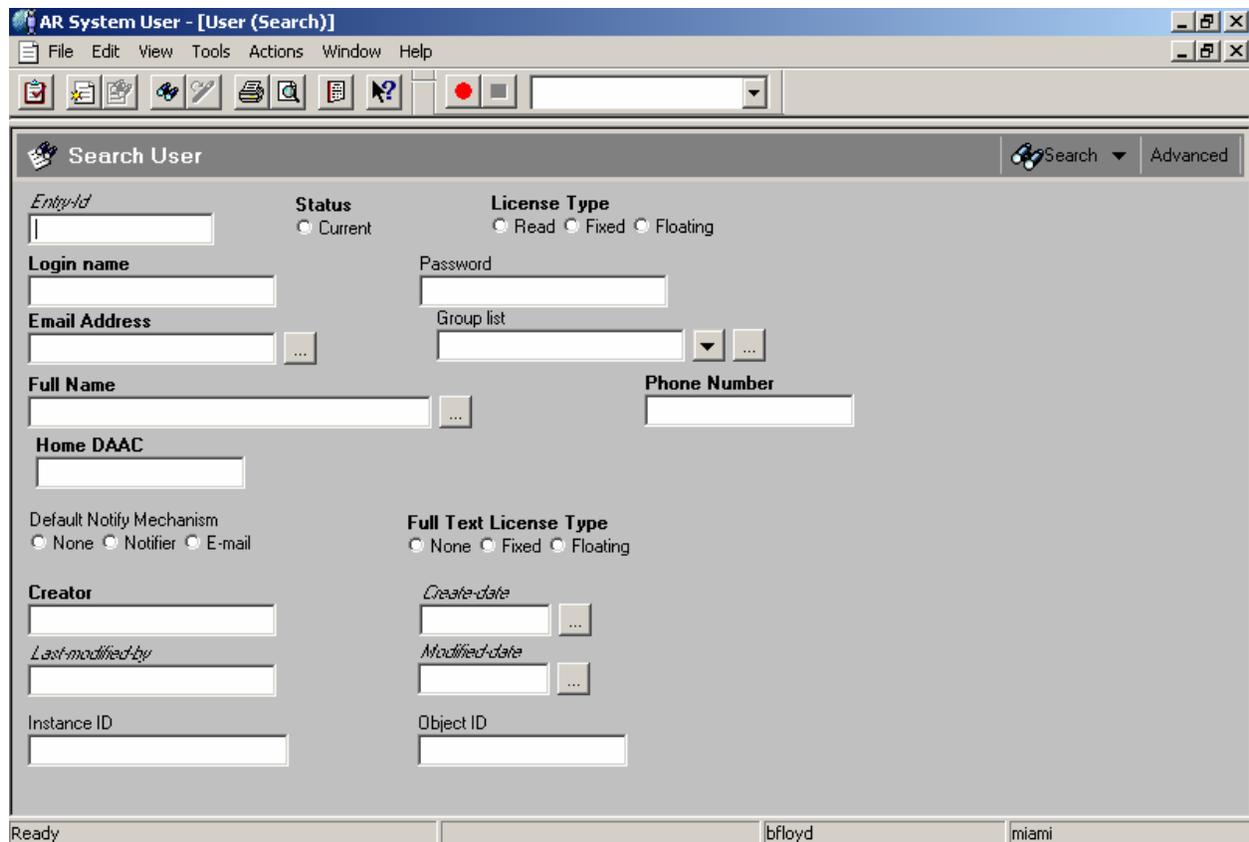
In addition to the fields described in the above table, the RelB-Trouble Tickets form provides the following buttons (active links):

- **Forward** – Forwards this Trouble Ticket to the site specified in the "Forward-to" field.
- **Hardware Information** – Opens a window associated with this Trouble Ticket to hold hardware information.
- **List All Masters** -- All Trouble Tickets that are duplicates of each other have one master. This button lists all master Trouble Tickets.
- **List This TT's Duplicate(s)** – List all Trouble Tickets having duplicates associated with this Trouble Ticket.
- **Goto Contact Log** – If the displayed Trouble Ticket was created from a Contact Log entry then this button opens a window to that Contact Log entry. Note, the Trouble Ticket was created from a Contact Log entry if the "Associated Contact Log Id" field has a value in it.

The RelB-Trouble Tickets form also provides the Search Criteria field, which is part of Remedy's Advanced Search Bar -- an aid for querying the database -- and is available on any form. Users can query the database in two ways. One can enter a value into any of the fields displayed on the form and click on the Search button in the tool bar or at the top of any form; this will open a display containing the database records having these values. Alternatively, one can specify search criteria in the Advanced Search Bar at the bottom of the GUI. Clicking on the "Fields" button in the search bar produces a pull down menu (or pick list) of fields, selection values, and keywords. These can be chosen in combination with any of the operations listed in the search bar before clicking on the form's Search button to display qualifying records.

#### **4.3.6.2.1 Remedy's User Tool Screen (User Form)**

The Remedy administrator uses the "User" form (shown in Figure 4.3.6-2 to add, modify or remove users from the Action Request (AR) System database. The "User" form is used in conjunction with the "Group" form to provide users with permissions ultimately determining which operations individual users can perform and which forms and fields they can access. For more information on the "User" form and the AR System access control, refer to the Action Request System 5.1, "Developing AR System Applications: Basic" manual.



**Figure 4.3.6-2. User Form GUI**

Table 4.3.6.3 provides a description of the User Form fields.

**Table 4.3.6-3. User Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Entry-Id	Character	15	System generated	Entry ID of user.
Login name	Character	30	Required	Login name of user.
Password	Character	30	Optional	Password of User.
Email Address	Character	255	Required	E-mail address of User.
Group list	Character	255	Optional	Groups to which the user belongs.
Full Name	Character	128	Required	Full Name of User.
Phone Number	Character	55	Required	Phone Number of User.
Home DAAC	Character	55	Required	Home DAAC of User.
Creator	Character	30	Required	Person who created the user account.
Create-date	Date/Time	17	System generated	Date and time the entry was created at the present site. (mm/dd/yy hh:mm:ss)
Last-modified-by	Character	30	System generated	User ID of person that last modified the user entry.
Modified-date	Date/Time	17	System generated	Date and time of last modification to user entry (mm/dd/yy hh:mm:ss).
Instance ID	Character	38	System generated	A Remedy reserve field for Remedy use only.
Object ID	Character	38	System generated	A Remedy reserve field for Remedy use only.

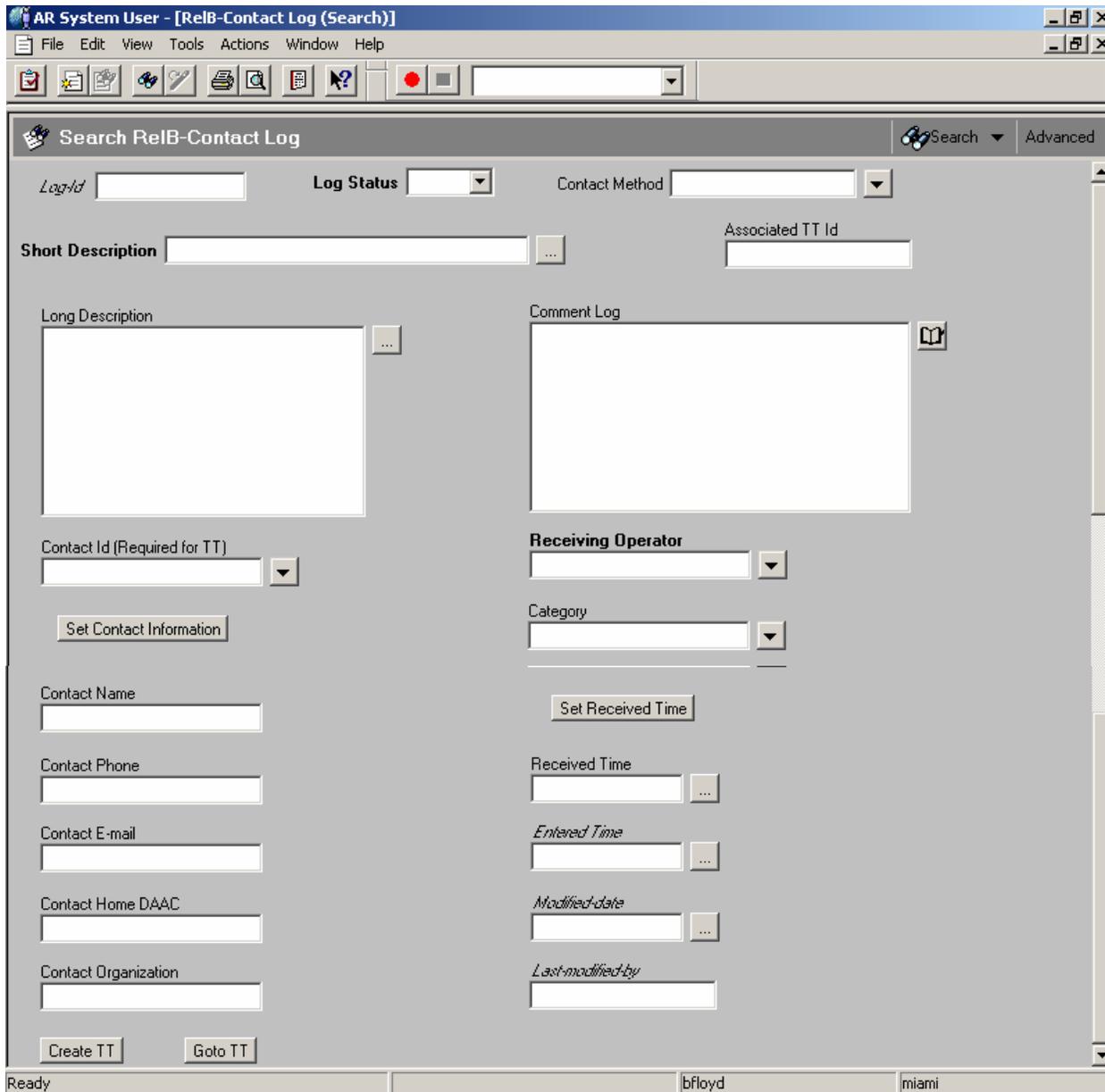
\*Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

In addition to the fields described in the above table, the Remedy User form contains the following radio button type fields:

- Status - Is user current or not as shown by the “current” button.
- License Type - What type of license does this user have (e.g., read, fixed, floating)?
- Default Notify Mechanism - Notification method (e.g., None, Notifier, and Email buttons.)
- Full Text License Type - Not applicable

#### **4.3.6.2.2 Remedy’s User Tool Screen (Contact Log Form)**

The Contact Log Form GUI, shown in Figure 4.3.6-3, is used to enter information about a contact to User Services.



**Figure 4.3.6-3. Contact Log Form GUI**

Table 4.3.6-4 provides a description of the Contact Log Form fields.

**Table 4.3.6-4. Contact Log Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Log-Id	Character	15	System generated	ID of Contact Log.
Log Status	Selection	*	Required	Status of Contact Log.
Contact Method	Character	50	Optional	Method used to contact the person entering the Contact Information.
Short Description	Character	128	Required	Short Description of the contact.
Associated TT Id	Character	60	Optional	If a Trouble Ticket is created from this Contact Log then this is the related Trouble Ticket ID.
Long Description	Character	255	Optional	Long Description of the contact.
Comment Log	Diary	Unlim	Optional	Any comments pertaining to the contact.
Contact Id (Required for TT)	Character	30	Optional	User ID of person calling in. (Required to create a Trouble Ticket)
Receiving Operator	Character	30	Required	Person receiving and entering the call.
Category	Character	60	Optional	Category of the contact.
Contact Name	Character	30	Optional	Name of person calling in.
Contact Phone	Character	20	Optional	Phone number of person calling in.
Contact E-mail	Character	64	Optional	E-mail of person calling in.
Contact Home DAAC	Character	60	Optional	Home DAAC of person calling in.
Contact Organization	Character	60	Optional	Organization of person calling in.
Received Time	Date/Time	17	Optional	Date and Time the contact was first made. (mm/dd/yy hh:mm:ss)
Entered Time	Date/Time	17	System generated	Date and Time initial information is entered. (mm/dd/yy hh:mm:ss)
Modified-date	Date/Time	17	System generated	Date and time of last modification to this Contact Log. (mm/dd/yy hh:mm:ss)
Last-modified-by	Character	30	System generated	User ID of person that last modified this Contact Log. (mm/dd/yy hh:mm:ss)

\* Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

In addition to the fields described in the above table, the Contact Log Form provides the following buttons:

- **Set Contact Information**--inserts data for fields: Contact Name, Contact Phone, Contact Email, and Contact Home DAAC provided the user's login name and associated data is registered in the Remedy User Form.
- **Set Received Time**--inserts the current time in the Received Time field.
- **Create TT**—creates a trouble ticket using the information in the Contact Log form.

- **Goto TT**—transfers one to the trouble ticket that is associated with the Contact Log entry if a trouble ticket was created from the Contact Log entry. If there is no value in the Associated TT id field, then there is no trouble ticket associated with the Contact Log record.

#### **4.3.6.2.3 Remedy's User Tool (Hardware Information Form)**

The Hardware Information Form GUI shown in Figure 4.3.6-4 is used to enter information about a particular piece of hardware that corresponds to a Trouble Ticket.

**Figure 4.3.6-4. Hardware Information Form GUI**

Table 4.3.6-5 provides a description of the Hardware Information Form fields.

**Table 4.3.6-5. Hardware Information Form Field Descriptions (1 of 3)**

Field Name	Data Type	Size	Entry	Description
Entry-Id	Character	15	System generated	Entry ID of user.
Create-date	Date/Time	17	System generated	Date and time the entry was created at the present site. (format: mm/dd/yy hh:mm:ss)
Last-modified-by	Character	30	System generated	User ID of person that last modified the Hardware Information screen.
Related Trouble Ticket Number	Character	30	Required	ID of a related Trouble Ticket.
Modified-date	Date/Time	17	System generated	Date and time of last modification to Hardware Information screen. (format: mm/dd/yy hh:mm:ss)
Date of Report	Character	255	Optional	Date the problem was reported. (format: mm/dd/yy)
Date and Time of Malfunction	Character	255	Optional	Date and time the problem was noticed or approximate time of failure. (format: mm/dd/yy hh:mm:ss)
Site Location of Malfunction	Character	255	Optional	DAAC site where the problem occurred.
Room number of Malfunction	Character	255	Optional	DAAC room number where the problem occurred.
Parent System ECS name	Character	255	Optional	Site-specific ECS name of the parent system.
Parent System CI	Character	255	Optional	Associated Baseline control item ID of parent system.
Parent System OS version	Character	255	Optional	Operating system version of the parent system.
Parent System Manufacturer	Character	255	Optional	Name of parent system vendor.
Parent System Model/Version	Character	255	Optional	Model name and version numbers of the parent system.
Parent System ECN number	Character	255	Optional	Equipment control number of parent system.
Parent System Serial Number	Character	255	Optional	Serial number of parent system.
Parent System total oper. hrs.	Character	255	Optional	Number of cumulative hours the parent system has been in operation (since the last failure).
Maint Vendor assigned to	Character	255	Optional	Name of the vendor contracted to maintain the hardware.
Maint Vendor phone number	Character	255	Optional	Maintenance vendor point of contact phone number.
Maint PO/Contract number	Character	255	Optional	Purchase order and contract number for maintenance vendor.

**Table 4.3.6-5. Hardware Information Form Field Descriptions (2 of 3)**

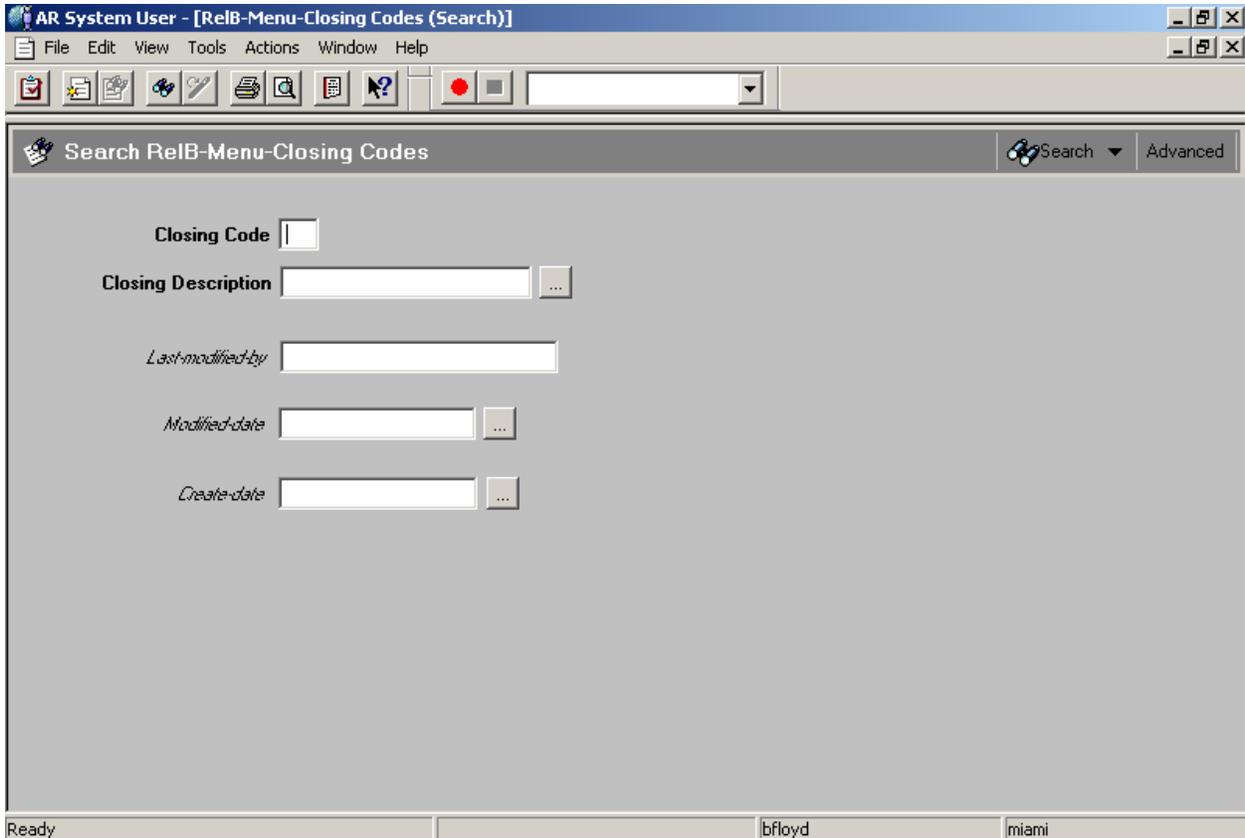
Field Name	Data Type	Size	Entry	Description
Maint Reference/Case number	Character	255	Optional	Reference/case number assigned by the vendor for the hardware problem.
Date and Time assigned/called	Character	255	Optional	Date and time the maintenance vendor was called and notified of the problem. (format: mm/dd/yy hh:mm:ss)
Technician assigned to	Character	255	Optional	Name of vendor maintenance technician.
System malf. error messages	Character	255	Optional	Error messages provided by the system.
Failure Impact Rating	Character	255	Optional	Failure criticality or severity rating.
Comments	Character	255	Optional	Field to provide any additional comments.
Corrective actions taken	Character	255	Optional	Actions taken to resolve the problem.
Failed/replacement item desc.	Character	255	Optional	Description of the failed component and its replacement.
Failed item total operating hr	Character	255	Optional	Number of hours the failed component was used in operation.
Failed item Manufacturer/model	Character	255	Optional	Manufacturer name and model number of failed component.
Replacement item Manufat/model	Character	255	Optional	Manufacturer name and model # of replacement component.
Failed item part number	Character	255	Optional	Vendor part number of failed component.
Replacement item part number	Character	255	Optional	Vendor part number of replacement component.
Failed item serial number	Character	255	Optional	Serial number of failed component.
Replacement item serial number	Character	255	Optional	Serial number of replacement component.
Failed item ECN	Character	255	Optional	Equipment control number of failed component.
Replacement item ECN	Character	255	Optional	Equipment control number of replacement component.
Time to repair in clock hours	Character	255	Optional	Elapsed time (not including delays, e.g., technician waiting for part, vendor shipping time, etc.) in clock hours taken to troubleshoot and isolate the problem, to replace the component, and test and verify the fix.
Total sys. down time clock hrs	Character	255	Optional	Elapsed time in clock hours the system was down for repair (includes administrative and logistical delays).
Malfunction resolved by	Character	255	Optional	Name of person who resolved the problem.

**Table 4.3.6-5. Hardware Information Form Field Descriptions (3 of 3)**

Field Name	Data Type	Size	Entry	Description
Resolve date and time	Character	17	Optional	Date and time the problem was resolved. (format: mm/dd/yy hh:mm:ss)
Corrective action verified by	Character	255	Optional	Person who verified the problem has been resolved.
Verification date and time	Character	17	Optional	Date and time problem resolution was verified. (format: mm/dd/yy hh:mm:ss)
FRB date reviewed	Character	11	Optional	Date the Failure Review Board reviewed the problem and corrective action. (format: mm/dd/yy)
Corr. action effective rating	Character	255	Optional	Effectiveness rating assigned by Failure Review Board (FRB).
Red Flag reportable (y/n)	Character	1	Optional	Record of FRB determining if the problem meets Red Flag reporting criteria.
Date Red Flag report submitted	Character	8	Optional	If the problem meets Red Flag criteria, the date it was reported. (format: mm/dd/yy)
Quality assurance name	Character	255	Optional	Name of quality assurance person reviewing the problem and its resolution.
Quality assurance date	Character	8	Optional	Date the quality assurance person reviewed the problem and its resolution.
ECS closure authority name	Character	255	Optional	Name of person from the ECS review board who can close the Trouble Ticket.
ECS closure authority date	Character	8	Optional	Date the ECS review board closed the Trouble Ticket. (format: mm/dd/yy)
GSFC malfunction report date	Character	8	Optional	Date the malfunction was reported to the GSFC review board. (format: mm/dd/yy)
GSFC final approval name	Character	255	Optional	Name of person from GSFC review board who can approve problem and its resolution.
GSFC final approval date	Character	8	Optional	Date approved by GSFC review board. (format: mm/dd/yy)

**4.3.6.2.4 Remedy's User Tool (RelB-Menu-Closing Codes Form)**

The RelB-Menu-Closing Codes Form GUI, shown in Figure 4.3.6-5, is used to add, delete, or modify the list of closing code choices for the field, Closing Code.



**Figure 4.3.6-5. RelB-Menu-Closing Codes Form GUI**

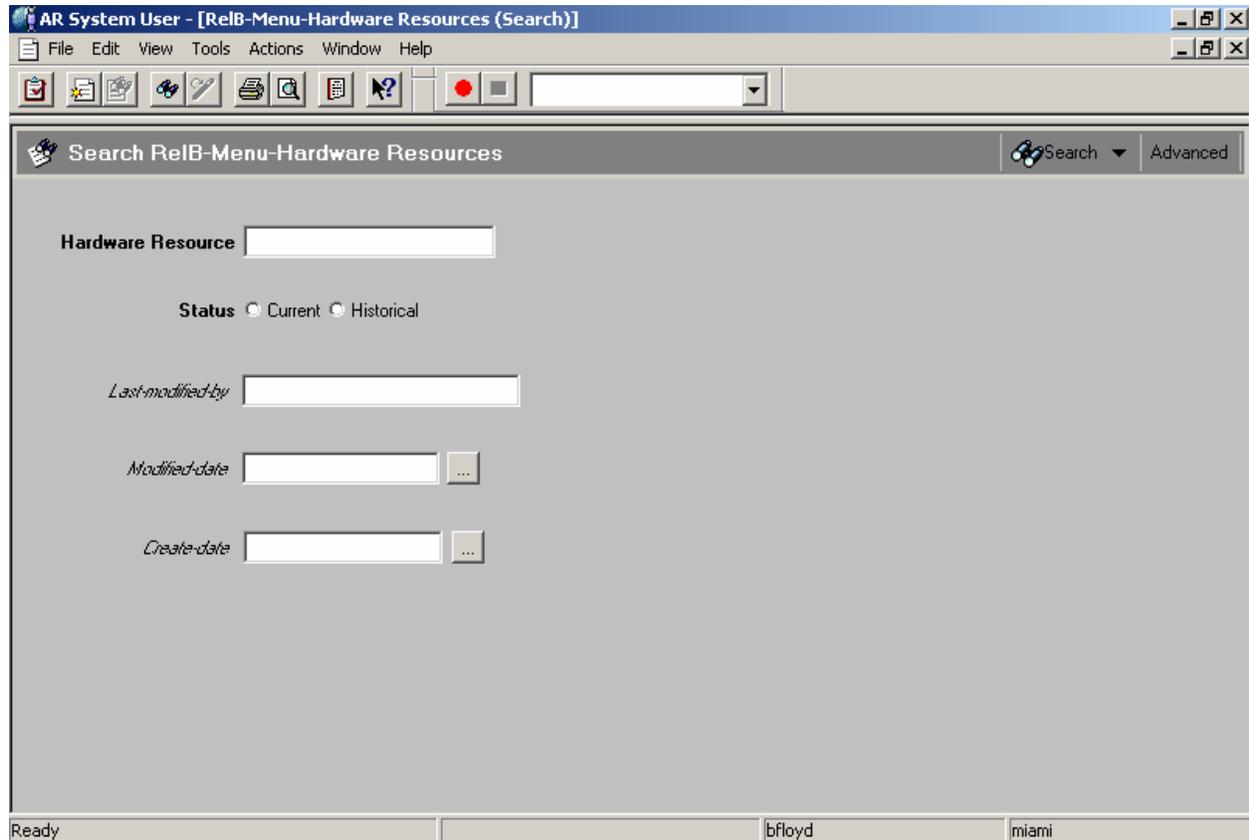
Table 4.3.6-6 provides a description of the RelB-Menu-Closing Code Form fields.

**Table 4.3.6-6. RelB-Menu-Closing Codes Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Closing Code	Character	2	Required	Two letter code that corresponds with the Closing Description; this is where codes can be added, deleted or changed.
Closing Description	Character	128	Required	Problem summary.
Last-modified-by	Character	30	System generated	User ID of person that last modified the closing codes.
Modified-date	Date/Time	17	System generated	Date and time of last modification to closing codes. (mm/dd/yy hh:mm:ss)
Create-date	Date/Time	17	System generated	Date and time of the closing codes were created at the present site. (mm/dd/yy hh:mm:ss)

#### 4.3.6.2.5 Remedy's User Tool (RelB-Menu-Hardware Resources Form)

The RelB-Menu Hardware Resources Form GUI, shown in Figure 4.3.6-6, is where one adds, deletes, or modifies the hardware resource choices for the field, Hardware Resource.



**Figure 4.3.6-6. Tool RelB-Menu-Hardware Resources Form GUI**

Table 4.3.6-7 provides a description of the RelB-Menu-Hardware Resources Form fields.

**Table 4.3.6-7. RelB-Menu-Hardware Resources Form Field Descriptions (1 of 2)**

Field Name	Data Type	Size	Entry	Description
Hardware Resource	Character	30	Required	Hardware resource to be added, deleted or modified.
Last-modified-by	Character	30	System generated	User ID of person that last modified the hardware resources.

**Table 4.3.6-7. ReIB-Menu-Hardware Resources Form  
Field Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Modified-date	Date/Time	17	System generated	Date and time of last modification to hardware resources. (mm/dd/yy hh:mm:ss)
Create-date	Date/Time	17	System generated	Date and time the hardware resource was created at the present site. (mm/dd/yy hh:mm:ss)

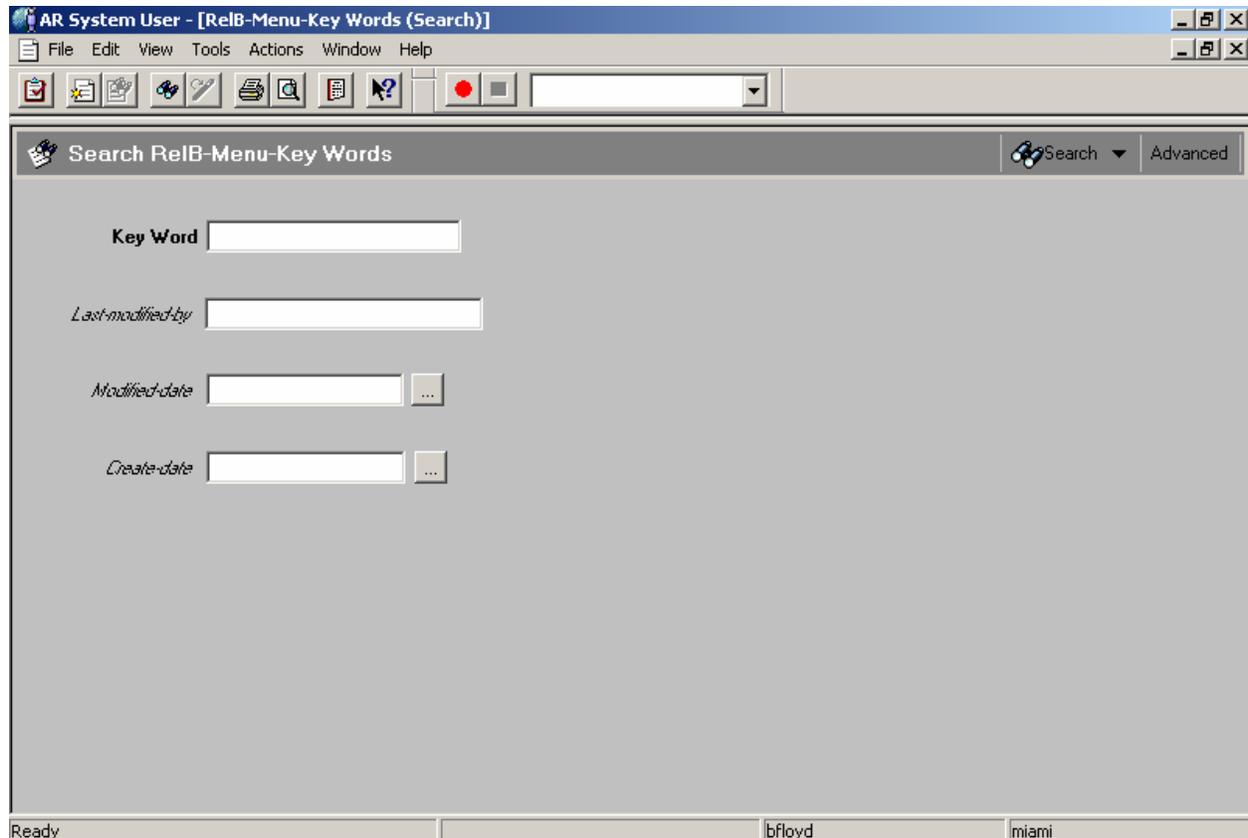
\* Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

In addition to the fields described in the above table, the ReIB-Trouble Tickets form provides the following radio button type field:

- Status – Current or historical status for this hardware resource.

#### 4.3.6.2.6 Remedy's User Tool (ReIB-Menu-Key Words Form)

The ReIB-Menu-Key Words Form GUI, shown in Figure 4.3.6-7, is used to add, delete, or modify the key word choices for the field, Key Word.



**Figure 4.3.6-7. ReIB-Menu-Key Words Form GUI**

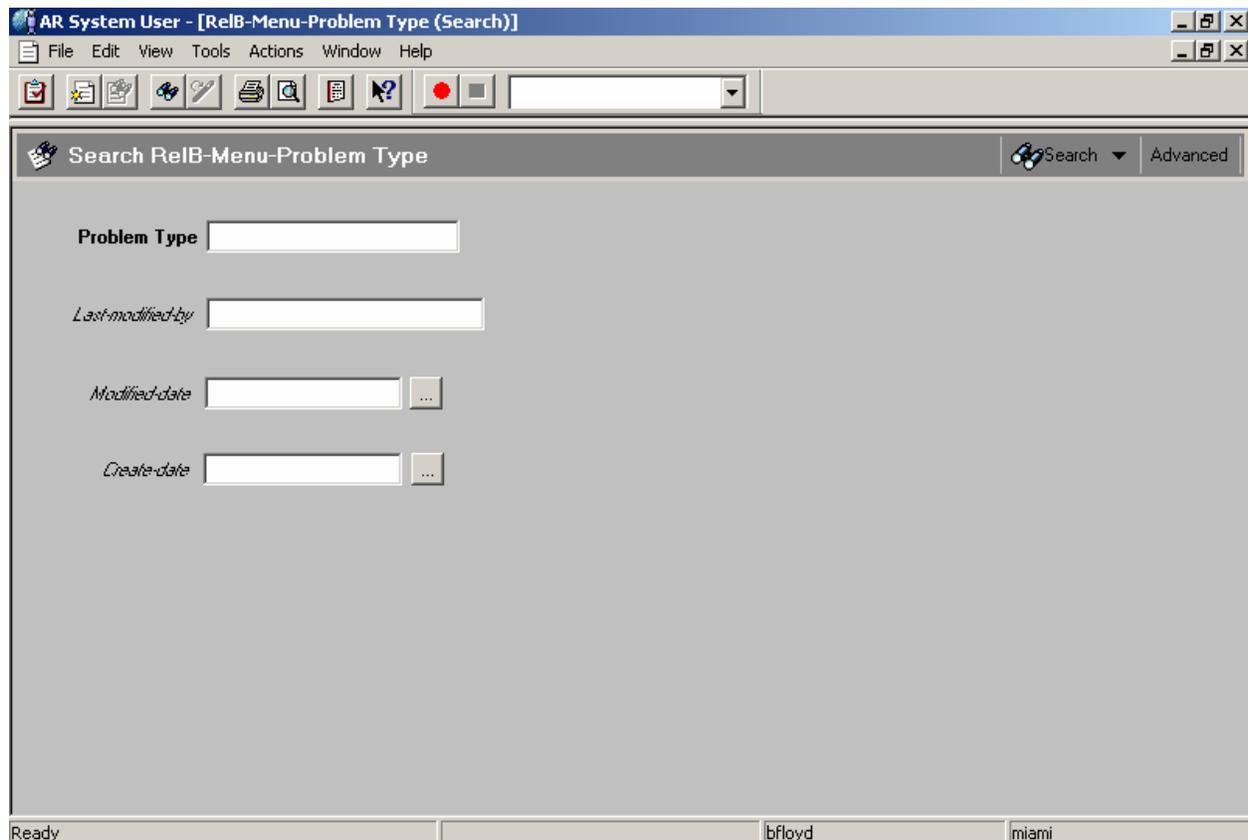
Table 4.3.6-8 provides a description of the RelB-Menu-Key Words Form fields.

**Table 4.3.6-8. RelB-Menu-Key Words Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Key Word	Character	30	Required	Key word for the Trouble Ticket; this is where key words can be added, deleted or modified.
Last-modified-by	Character	30	System generated	User ID of person that last modified the Key Words.
Modified-date	Date/time	17	System generated	Date and time of last modification to Key Words. (mm/dd/yy hh:mm:ss)
Create-date	Date/time	17	System generated	Date and time the Key Words were created at the present site. (mm/dd/yy hh:mm:ss)

#### 4.3.6.2.7 Remedy's User Tool (RelB-Menu-Problem Type Form)

The RelB-Menu-Problem Type Form GUI, shown in Figure 4.3.6-8, is used to add, delete, or modify the problem type choices for the field, Problem Type.



**Figure 4.3.6-8. RelB-Menu-Problem Type Form GUI**

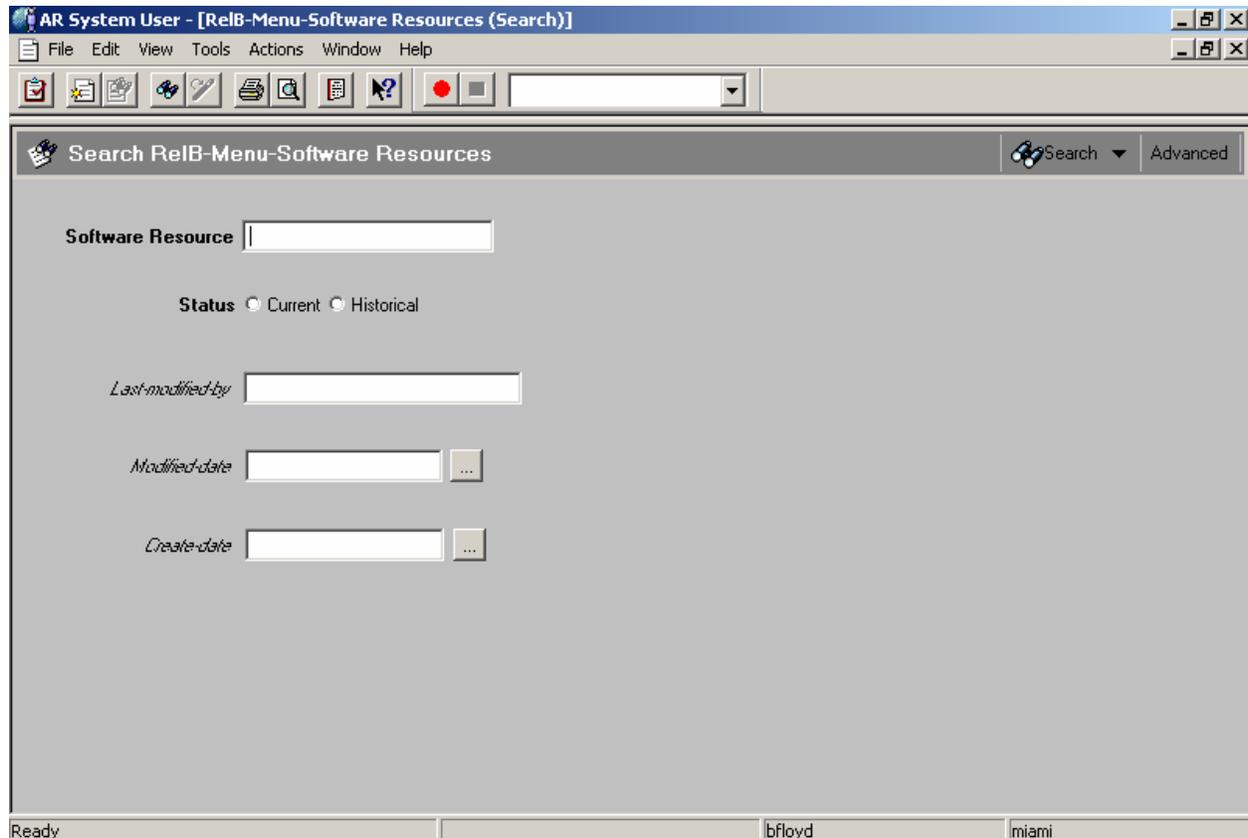
Table 4.3.6-9 provides a description of the RelB-Menu-Problem Type Form fields.

**Table 4.3.6-9. RelB-Menu-Problem Type Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Problem Type	Character	30	Required	Problem type of the Trouble Ticket; this is where problem types can be added, deleted or modified.
Last-modified-by	Character	30	System generated	User ID of person that last modified the Problem Type.
Modified-date	Date/Time	17	System generated	Date and time of last modification to Problem Type. (mm/dd/yy hh:mm:ss)
Create-date	Date/Time	17	System generated	Date and time the Problem Type was created at the present site. (mm/dd/yy hh:mm:ss)

#### 4.3.6.2.8 Remedy's User Tool (RelB-Menu-Software Resources Form)

The RelB-Menu-Software Resources Form GUI, shown in Figure 4.3.6-9, is used to add, delete, or modify the software resource choices for the field, Software Resource.



**Figure 4.3.6-9. RelB-Menu-Software Resources Form GUI**

Table 4.3.6-10 provides a description of the RelB-Menu-Software Resource Form fields.

**Table 4.3.6-10. RelB-Menu-Software Resources Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Software Resource	Character	30	Required	Software resource to be added, deleted or modified.
Last-modified-by	Character	30	System generated	User ID of person that last modified the software resources.
Modified-date	Date/Time	17	System generated	Date and time of last modification to software resources. (mm/dd/yy hh:mm:ss)
Create-date	Date/Time	17	System generated	Date and time the software resources were created at the present site. (mm/dd/yy hh:mm:ss)

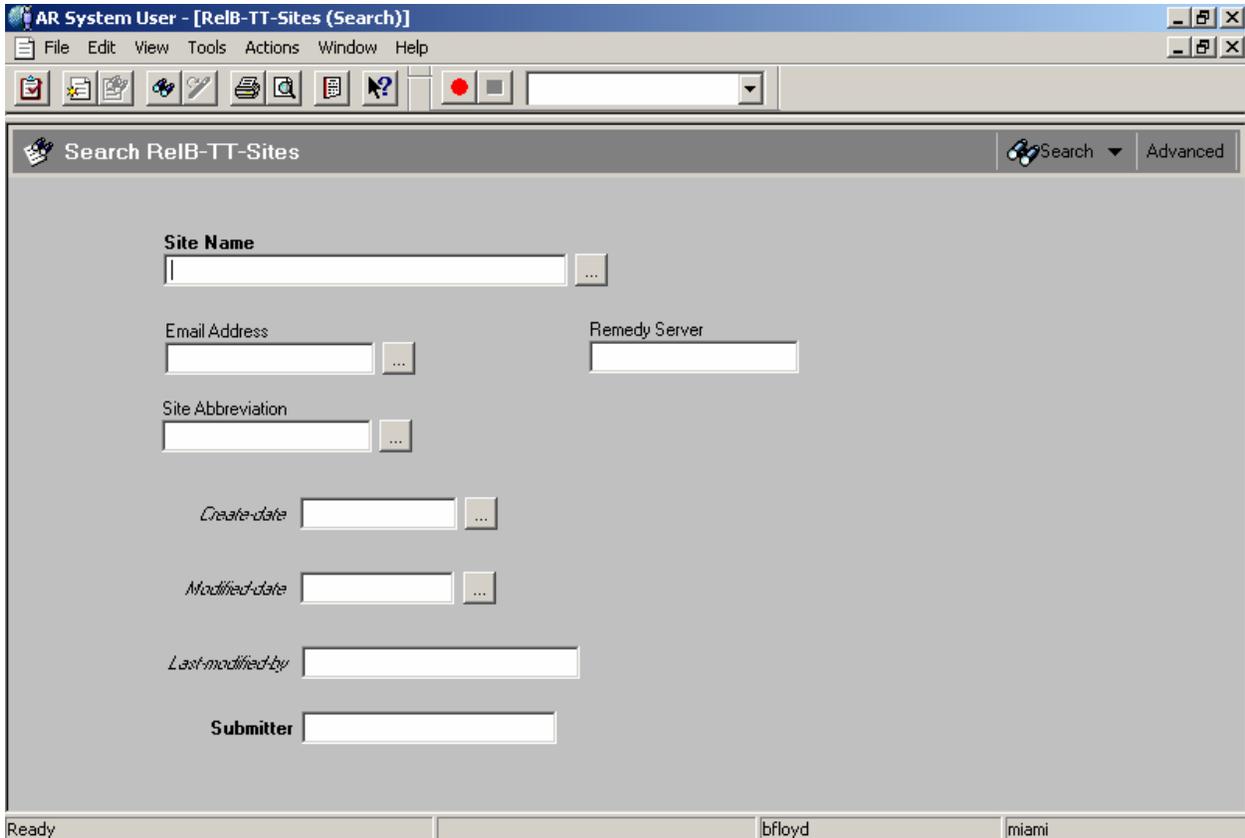
\* Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

In addition to the fields described in the above table, the RelB-Trouble Tickets form provides the following radio button type field:

- Status – Current or historical status of this software resource.

#### **4.3.6.2.9 Remedy's User Tool (RelB-TT-Sites Form)**

The RelB-TT-Sites Form GUI, shown in Figure 4.3.6-10, indicates the site name and email address to be used in forwarding.



**Figure 4.3.6-10. RelB-TT-Sites Form GUI**

Table 4.3.6-11 provides a description of the RelB-TT-Sites form fields.

**Table 4.3.6-11. RelB-TT-Sites Form Field Descriptions (1 of 2)**

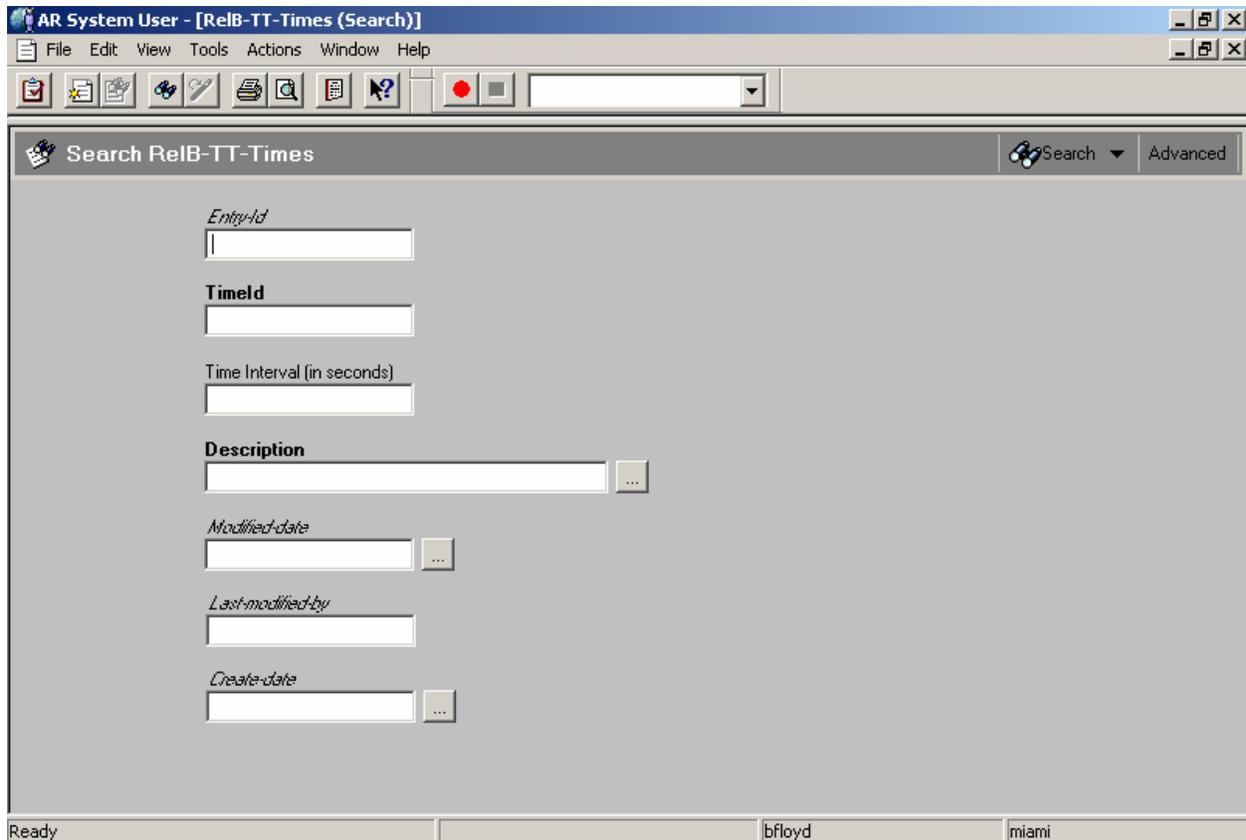
Field Name	Data Type	Size	Entry	Description
Site Name	Character	128	Required	Name of EOS Site.
Email Address	Character	255	Optional	E-mail address of EOS Site.
Remedy Server	Character	55	Optional	Name of server at site where Remedy is installed.
Site Abbreviation	Character	255	Optional	Abbreviation of site name.
Create-date	Date/Time	17	System generated	Date and time the RelB-TT-Sites were created at the present site. (mm/dd/yy hh:mm:ss)
Modified-date	Date/Time	17	System generated	Date and time of last modification to RelB-TT-Sites. (mm/dd/yy hh:mm:ss)

**Table 4.3.6-11. RelB-TT-Sites Form Field Descriptions (2 of 2)**

Field Name	Data Type	Size	Entry	Description
Last-modified-by	Character	30	System generated	User ID of person that last modified the RelB-TT-Sites.
Submitter	Character	30	Required	User ID.

**4.3.6.2.10 Remedy’s User Tool (RelB-TT-Times Form)**

The RelB-TT-Times Form GUI (Figure 4.3.6-11) is used to indicate escalation times. An escalation time is an amount of time given for some action to occur on a trouble ticket. If action is not initiated within the specified time, Remedy is set up to notify the assigned support staff member or maybe a higher level manager of the presence of the trouble ticket so that he/she may initiate immediate action.



**Figure 4.3.6-11. RelB-TT-Times Form GUI**

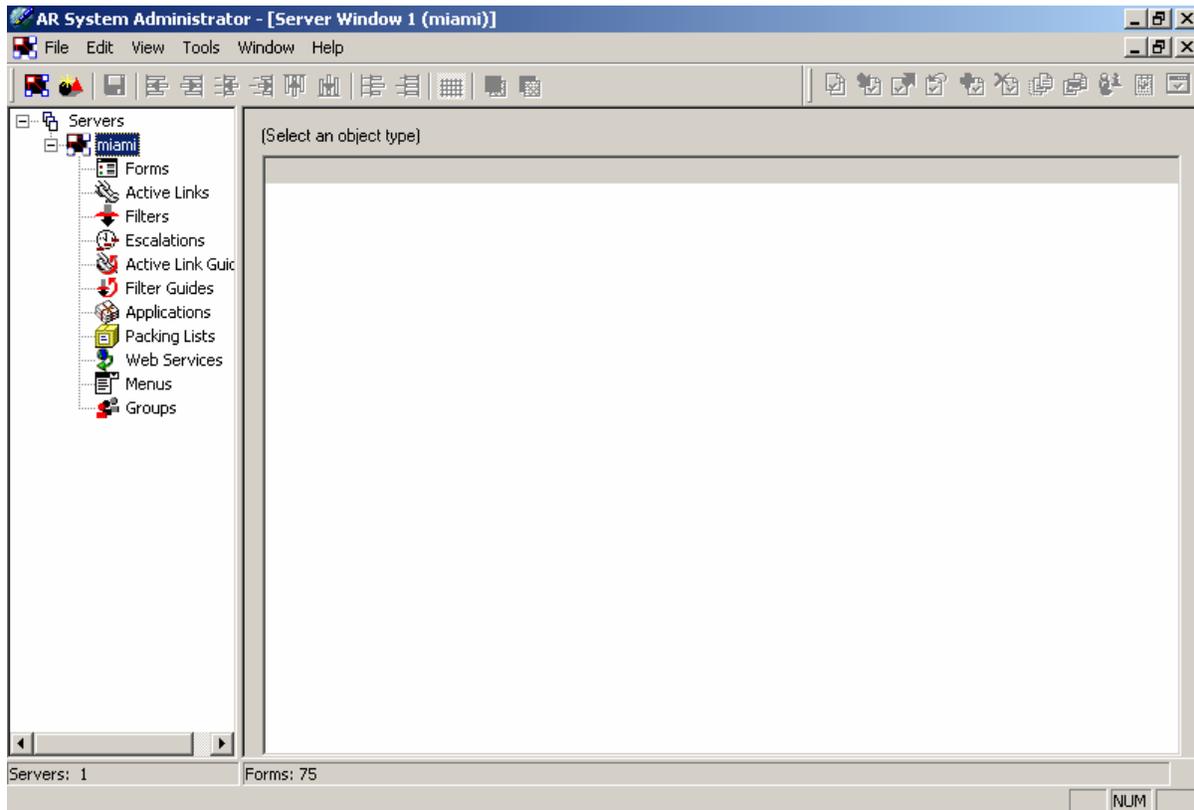
Table 4.3.6-12 provides a description of the RelB-TT-Times Form fields.

**Table 4.3.6-12. RelB-TT-Times Form Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Entry-Id	Character	15	System generated	Entry ID of Time entry.
TimeId	Character	30	Required	Escalation ID of Time entry.
Time Interval (in seconds)	Integer	4	Optional	Time interval (in seconds) for escalation to take place.
Description	Character	128	Required	What escalation this time corresponds to.
Modified-date	Date/Time	17	System generated	Date and time of last modification to RelB-TT-Sites. (mm/dd/yy hh:mm:ss)
Last-modified-by	Character	30	System generated	User ID of person that last modified the RelB-TT-Sites.
Create-date	Date/Time	17	System generated	Date and time the RelB-TT-Sites were created at the present site. (mm/dd/yy hh:mm:ss)

#### 4.3.6.2.11 Remedy's Admin Tool GUI

The Remedy Administrator Tool is the tool one uses to create, modify, and delete Remedy objects (e.g., forms and menus). Figure 4.3.6-12 shows the main Administrator Tool GUI and its starting screen, the server window, and the workflow objects categories.



**Figure 4.3.6-12. Admin Tool GUI**

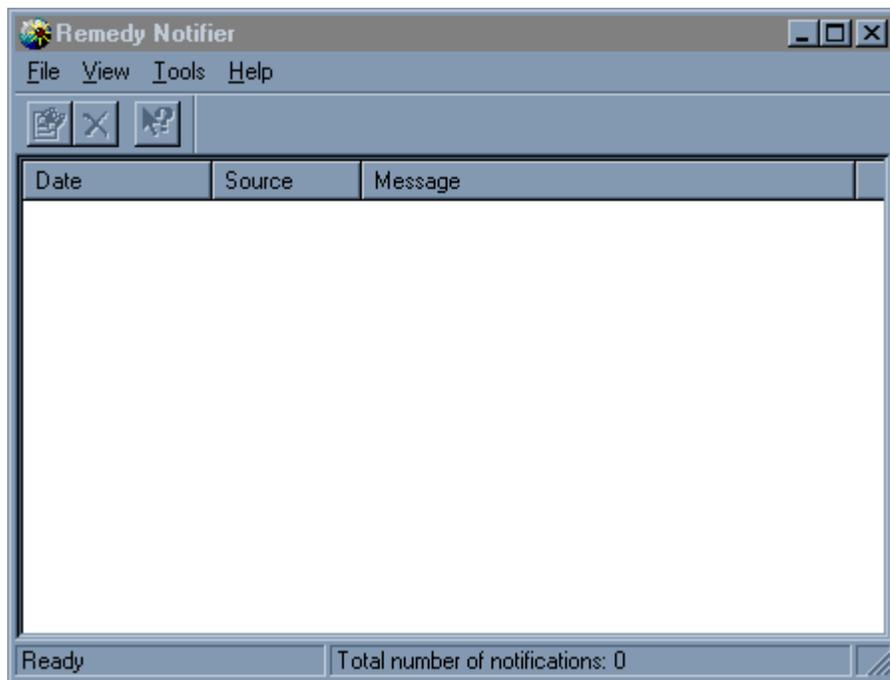
Table 4.3.6-13 provides a description of the Admin Tool GUI Workflow objects. For more information on these options, reference the Administrator Tool's Help menu by clicking the Start button and then selecting Programs → Action Request System → AR System Administrator Help.

**Table 4.3.6-13. Admin Tool GUI, Workflow Object Descriptions**

Workflow Object	Size	Entry	Description
Forms	Variable	System Generated	List of available forms.
Active links	Variable	System Generated	List of available active links.
Filters	Variable	System Generated	List of available filters.
Escalations	Variable	System Generated	List of available escalations.
Guides	Variable	System Generated	List of available guides.
Applications	Variable	System Generated	List of available applications.
Packing lists	Variable	System Generated	List of available packing lists.
Menus	Variable	System Generated	List of available menus.
Groups	Variable	System Generated	List of available groups.

#### 4.3.6.2.12 Remedy's Notification Tool

The Notification Tool can be used to alert users when a trouble ticket has been submitted or when a trouble ticket progresses from one status (e.g., new, assigned, etc.) to another status. Figure 4.3.6-13 shows the Notification Tool screen.



**Figure 4.3.6-13. Notification Tool GUI**

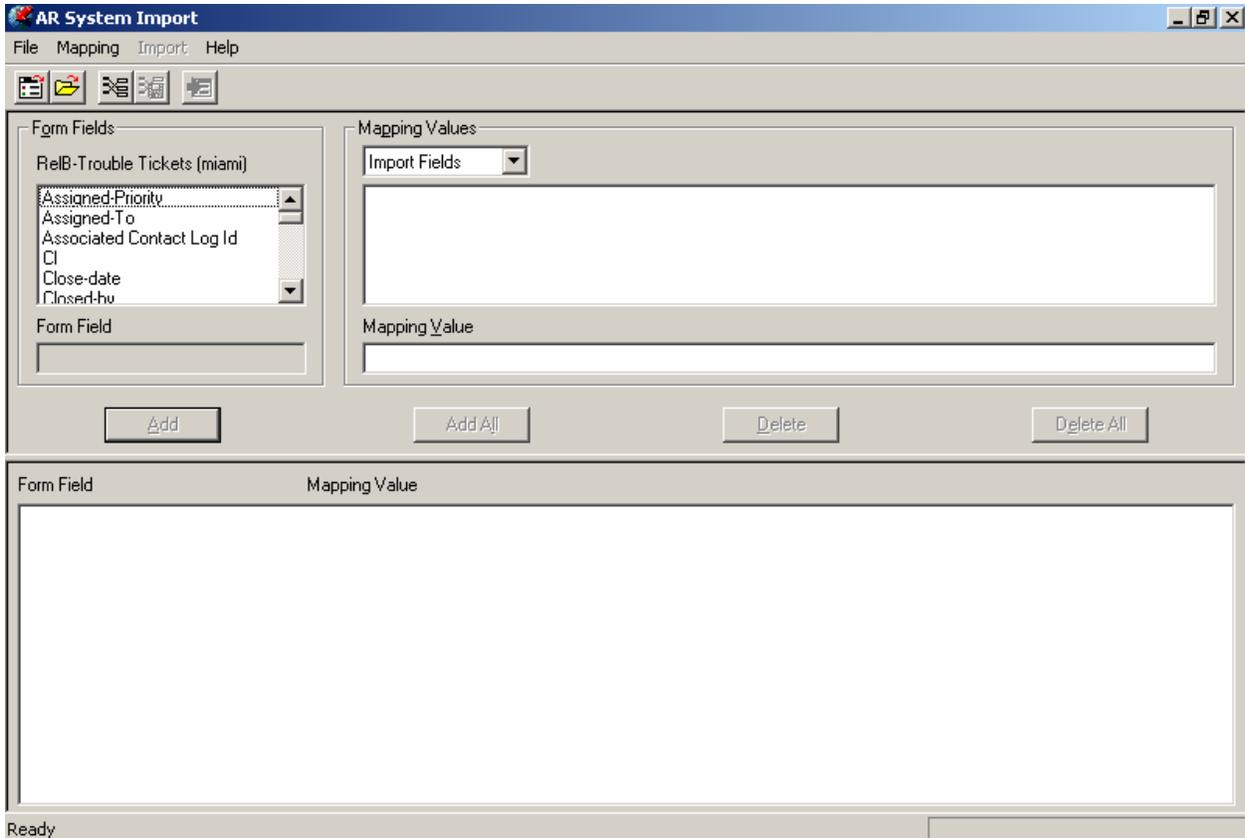
Table 4.3.6-14 provides a description of the Notification fields. For more information on the Notification Tool, see its standard online help that is accessed by clicking the Start button and then selecting Programs → Action Request System → Remedy Notifier Help.

**Table 4.3.6-14. Notification Field Descriptions**

<b>Field Name</b>	<b>Data Type</b>	<b>Size</b>	<b>Entry</b>	<b>Description</b>
Date	Character	Variable	System generated	Timestamp of the notification.
Source	Character	Variable	System generated	Source of the trouble ticket.
Message	Character	Variable	System generated	The short description from the trouble ticket.
Total number of notifications	Integer	Variable	System generated	Current count of the total number of notifications assigned.

#### **4.3.6.2.13 Remedy's Import Tool**

The Import Tool enables one to load data into a form from a data file previously created in the User Tool, a third party report writer, or another application. Figure 4.3.6-14 shows the Import Tool screen.



**Figure 4.3.6-14. Import Tool GUI**

Table 4.3.6-15 provides a description of the Import fields. For more information on the Import Tool, see its standard online help that is accessed by clicking the Start button and then selecting Programs → Action Request System → AR System Import Help.

**Table 4.3.6-15. Import Field Descriptions**

Field Name	Data Type	Size	Entry	Description
Form Fields	Character	Variable	System generated	Displays fields available in the selected form.
Mapping Values	Character	Variable	User Selected	Displays mapping values available for the selected form fields.
Form Field / Mapping Value	Character	Variable	System generated	Displays the chosen import / form mappings.

In addition to the fields described in Table 4.3.6-15, the Import Tool GUI has the following buttons:

- **Add**-- create a mapping between a destination form field and one of the import fields.
- **Add All**--map all of the import fields directly to the destination form fields with the same field ID or field name.
- **Delete**--delete the selected mapping in the mapping list.
- **Delete All**--delete all of the mappings from the mapping list.

#### 4.3.6.2.14 Remedy's Trouble Ticket Form's Web View

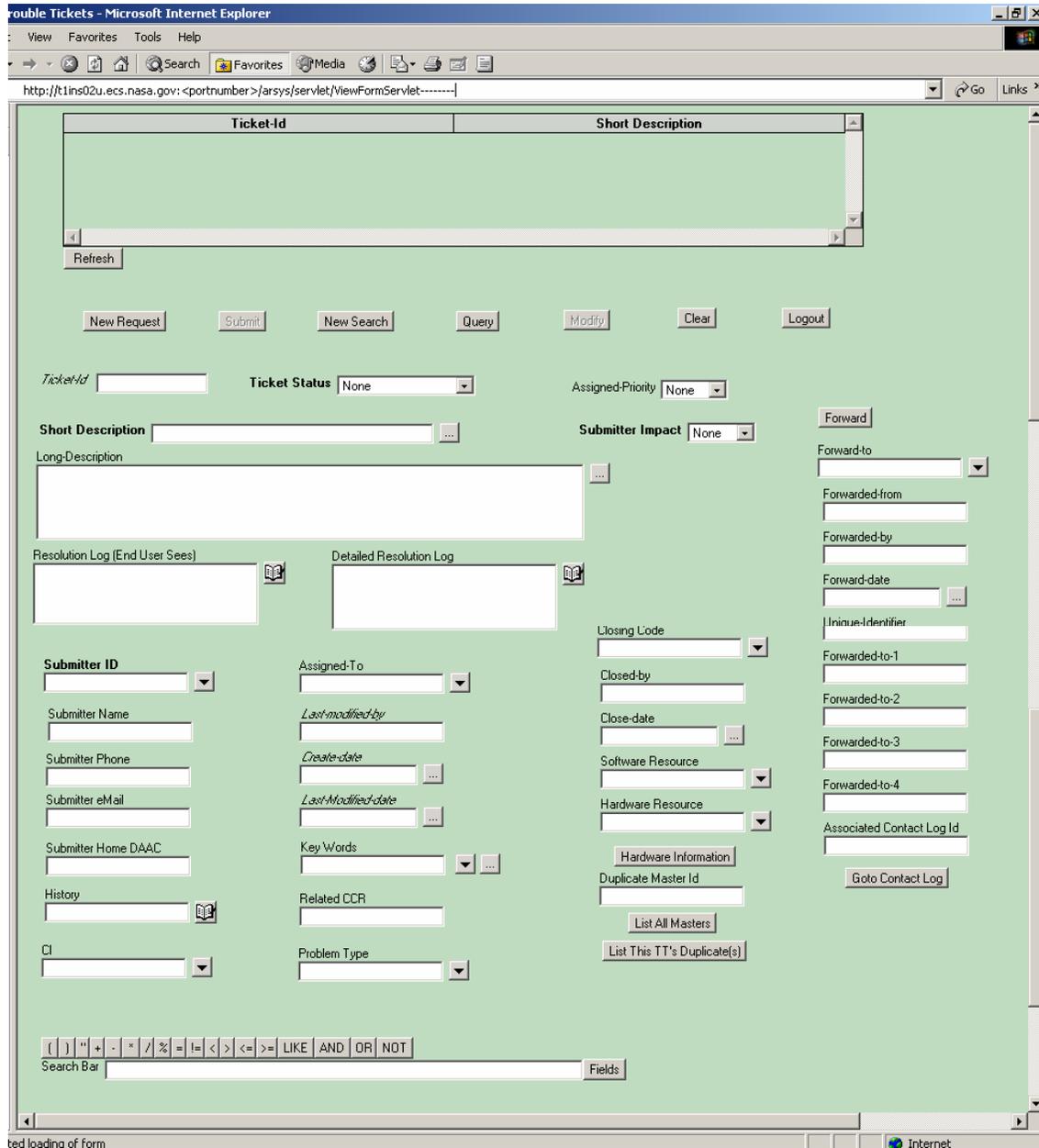
Remedy ARS 5.1.2 has a Web capability that enables one to create and use Web views of Remedy forms. A Web view of the Trouble Tickets form was created to enable submission, querying, and modification of trouble tickets via an Internet Explorer 6.0 or higher or Netscape 7.0 or higher Web browser. To get to the Web view of the Trouble Tickets form, execute Internet Explorer (or Netscape) and enter a URL similar to this example but applicable to your remedy server. For example:

[http://t1ins02u.ecs.nasa.gov:<port\\_number>/arsys/servlet/ViewFormServlet?formalias=RelBTroubleTickets&server=t1ins02.vatc.ecs.nasa.gov](http://t1ins02u.ecs.nasa.gov:<port_number>/arsys/servlet/ViewFormServlet?formalias=RelBTroubleTickets&server=t1ins02.vatc.ecs.nasa.gov). The Remedy ARS 5.1.2 login window is then displayed as shown in Figure 4.3.6-15.



**Figure 4.3.6-15. Remedy ARS 5.1.2 Web Login Window**

Enter your User Name and Password and then click the Login button to login. After login, the Trouble Tickets Form is displayed as shown in Figure 4.3.6-16 below. Note, the Trouble Tickets form's Web view has all of the Trouble Tickets form's fields plus some additional form action fields. The form actions fields, displayed as a field or a button, enable one to perform actions via a Web browser that are similar to the actions performed on a PC or Unix client. The added form action field names are: Results List, New Request, Submit, New Search, Query, Modify, Clear, and Search Bar. A Logout button is also added to enable proper closing of the RelB-Trouble Tickets form's Web view.

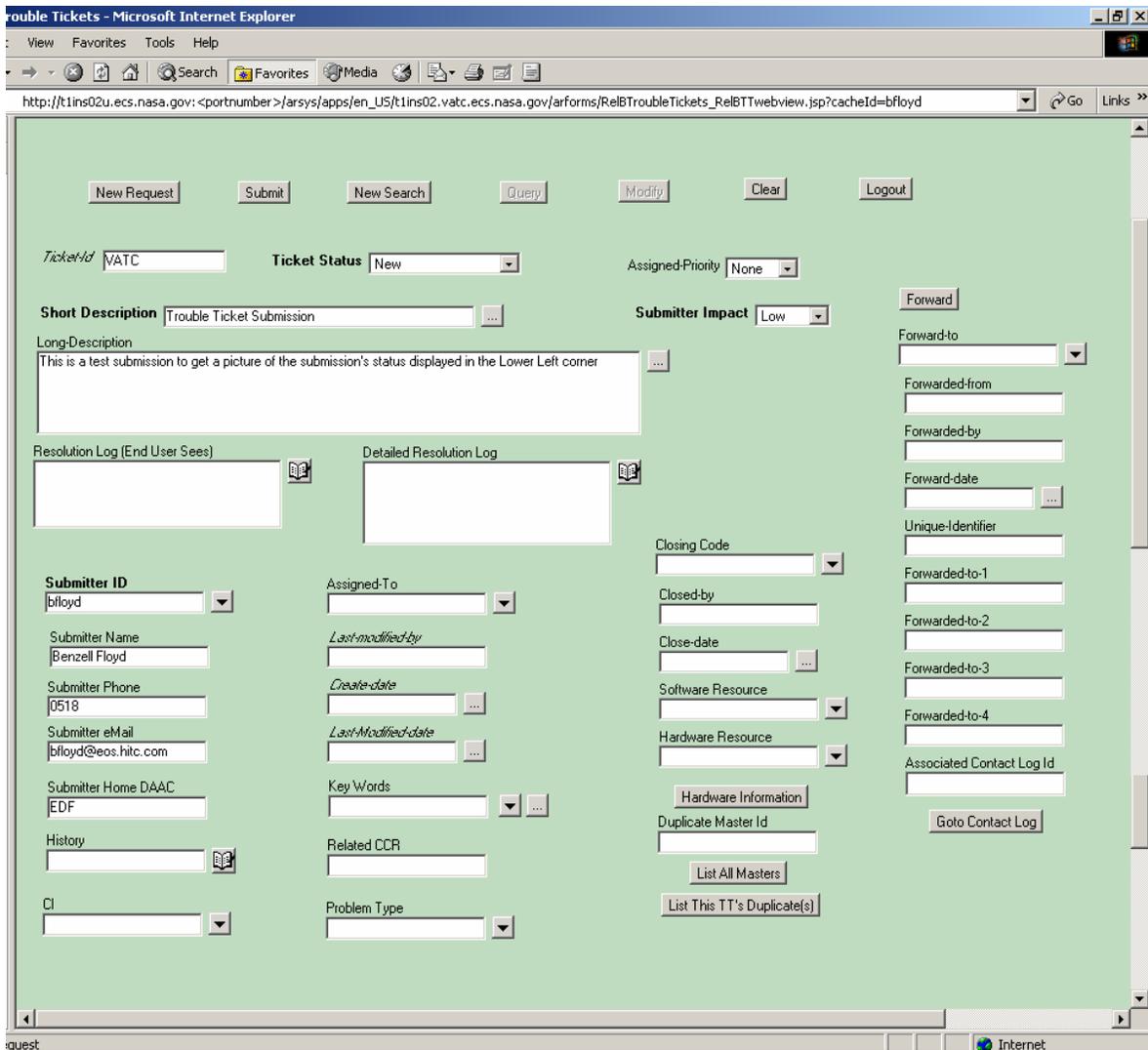


**Figure 4.3.6-16. Remedy Trouble Ticket Form Initial Web View**

The added fields are described as follows:

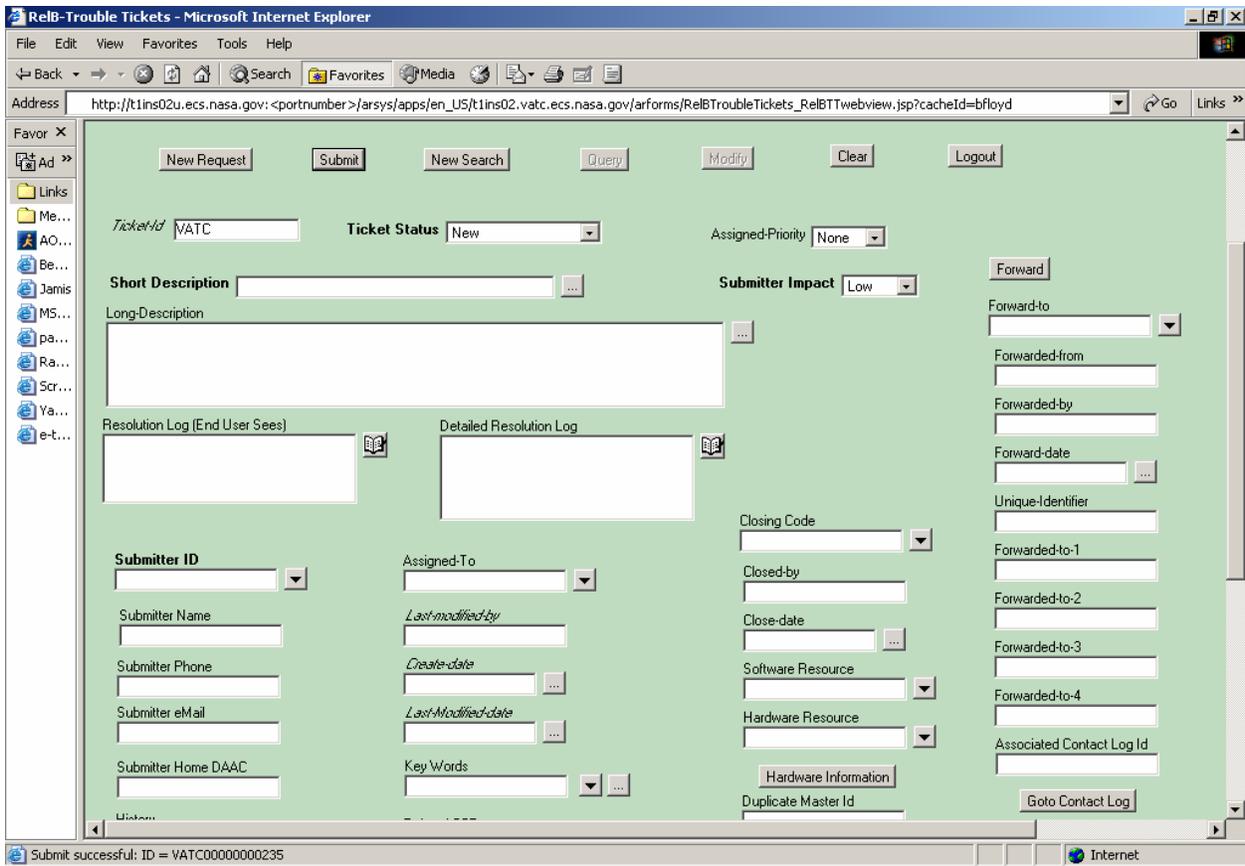
- Results List field, located at the top of the Web view with “Ticket-Id” and “Short Description” at the top of its columns, is used to show the results of a query;
- New Request button is used to open the Web view in “New” mode so one can enter information for a new trouble ticket;
- Submit button, highlighted only when you are in the “New” (New Request) mode, is used to send the data on the form to the database;
- New Search button is used to open the Web view in “Search” mode so that one can begin a new search;
- Query button – used to submit search criteria to the database and cause the results to be displayed in the Results List field;
- Modify button is used to submit a trouble ticket’s changes to the Remedy database;
- Clear button is used to remove all entries on the form that have not been saved;
- Logout button is used to close the Trouble Ticket form’s Web view;
- Search Bar field, located at the bottom of the form, displays the advance search bar on the Web view so one can perform advance searches.

The appearance of the Trouble Tickets form’s Web view will vary depending on the function that one chooses to perform. Click the **New Request** button to display the Trouble Tickets form in the “New” mode as shown in Figure 4.3.6-17. In the New mode, one can enter trouble ticket information into the form’s Web view for subsequent submission to the Remedy database. Note, the Results List and Search Bar fields are not displayed because they are not needed for submission of a trouble ticket.



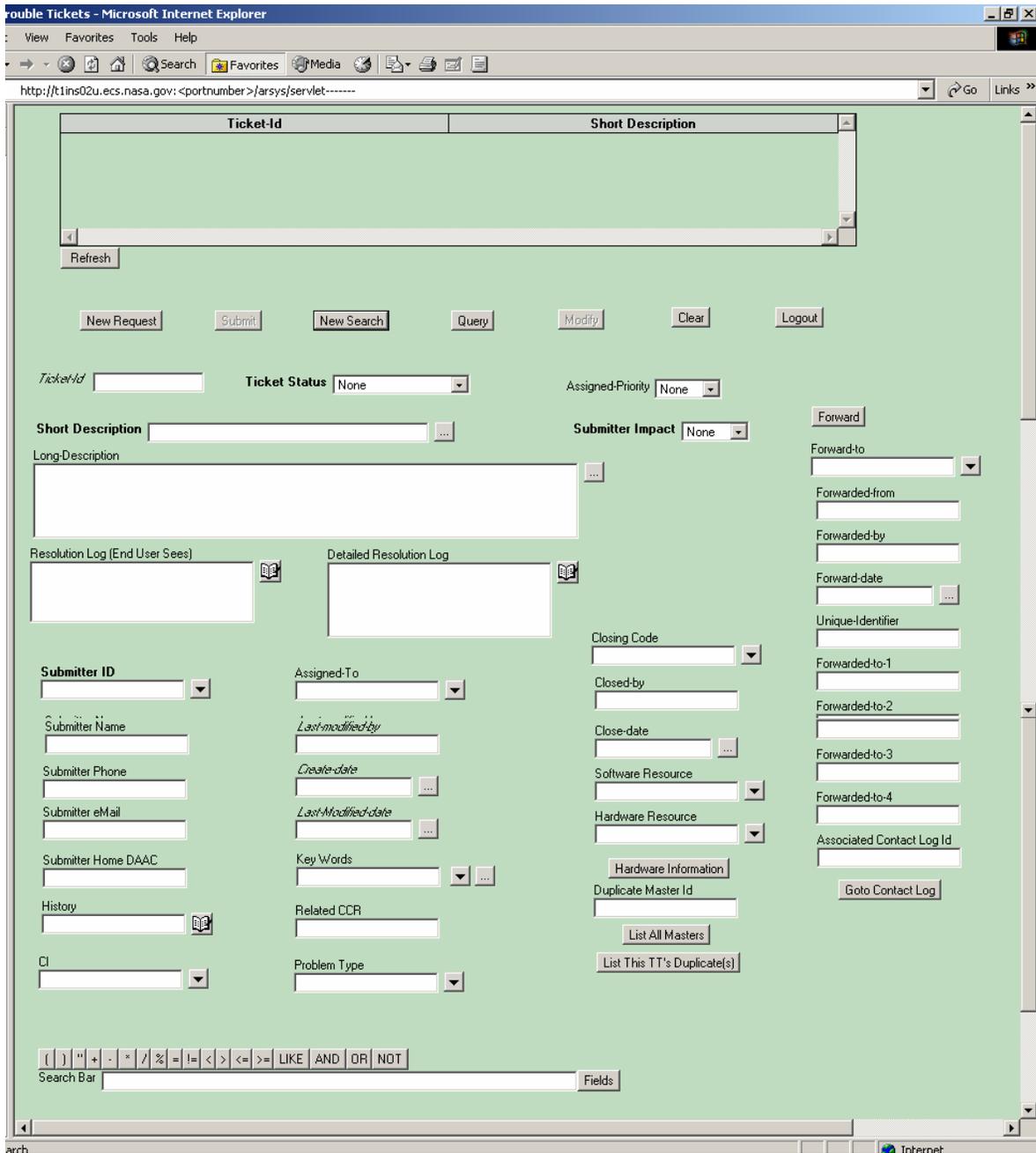
**Figure 4.3.6-17. Remedy Trouble Ticket Form (New Request) Web View**

Click the **Submit** button to submit a new trouble ticket entry. Once an entry is submitted, the status of the submission is displayed in the lower left corner of the window as illustrated in Figure 4.3.6-18 and a new “New Request” window is displayed for the next trouble ticket submission.



**Figure 4.3.6-18. Remedy Trouble Ticket Form (Submission Status) Web View**

Click the **New Search** button to display the Trouble Ticket Form’s “Search” mode Web view. The Search mode trouble ticket Web view appears as shown in Figure 4.3.6-19. Note, the Results List, Query button, and Search Bar are displayed because they are either needed or can be used when searching for specific trouble tickets.



**Figure 4.3.6-19. Remedy Trouble Ticket Form (New Search) Web View**

After search criteria are entered, Click the **Query** button to transmit the search criteria to Remedy and the results are displayed as shown in Figure 4.3.6-20. Note that the Results List contains the trouble tickets that met the search criteria and that some new fields are now displayed below the Results List. The functions of these fields are as follow:

- Select All – enables one to select all of the trouble tickets listed in the Results List field;
- Deselect All – enables one to deselect all of the fields in the Results List field;

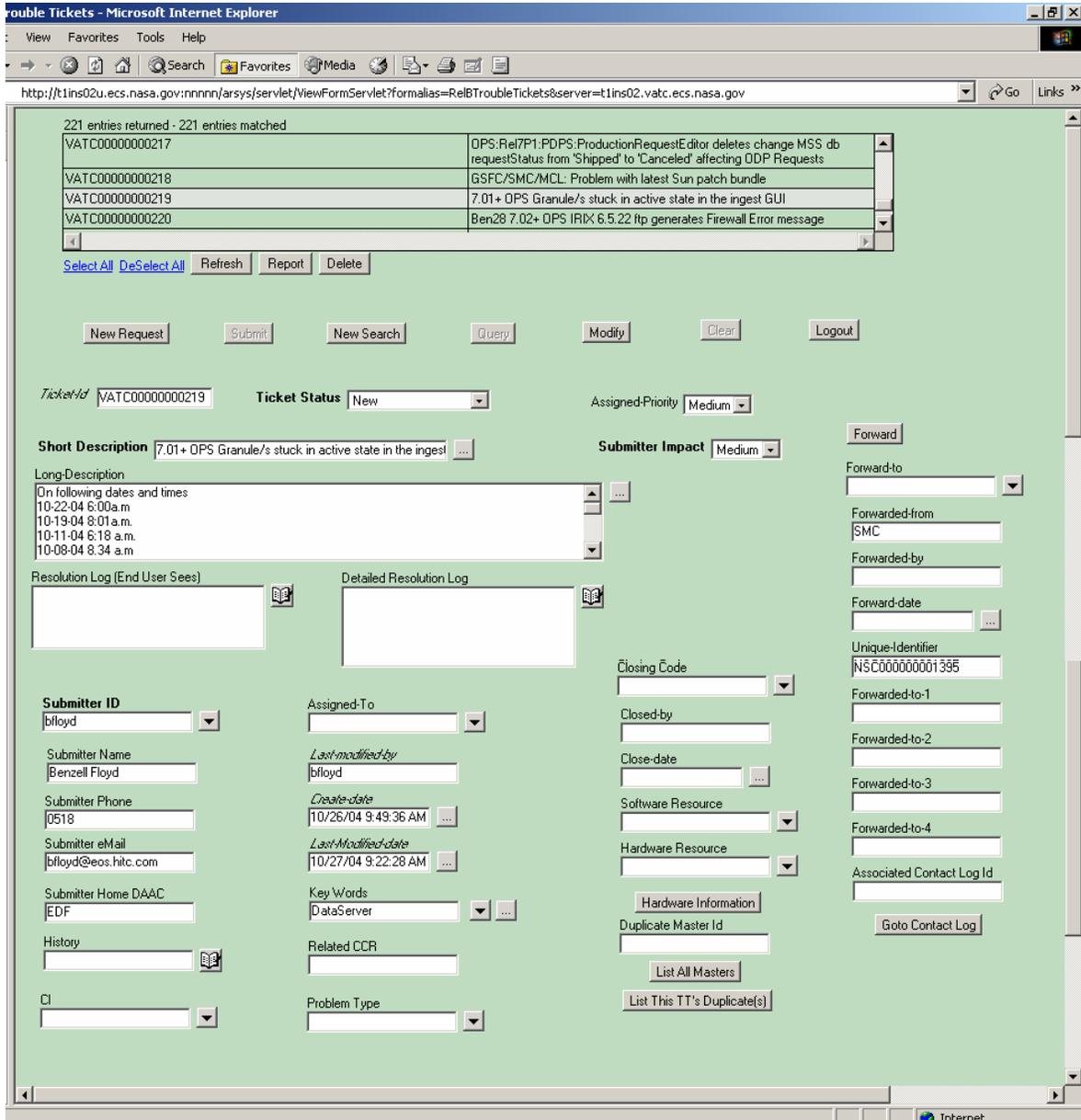
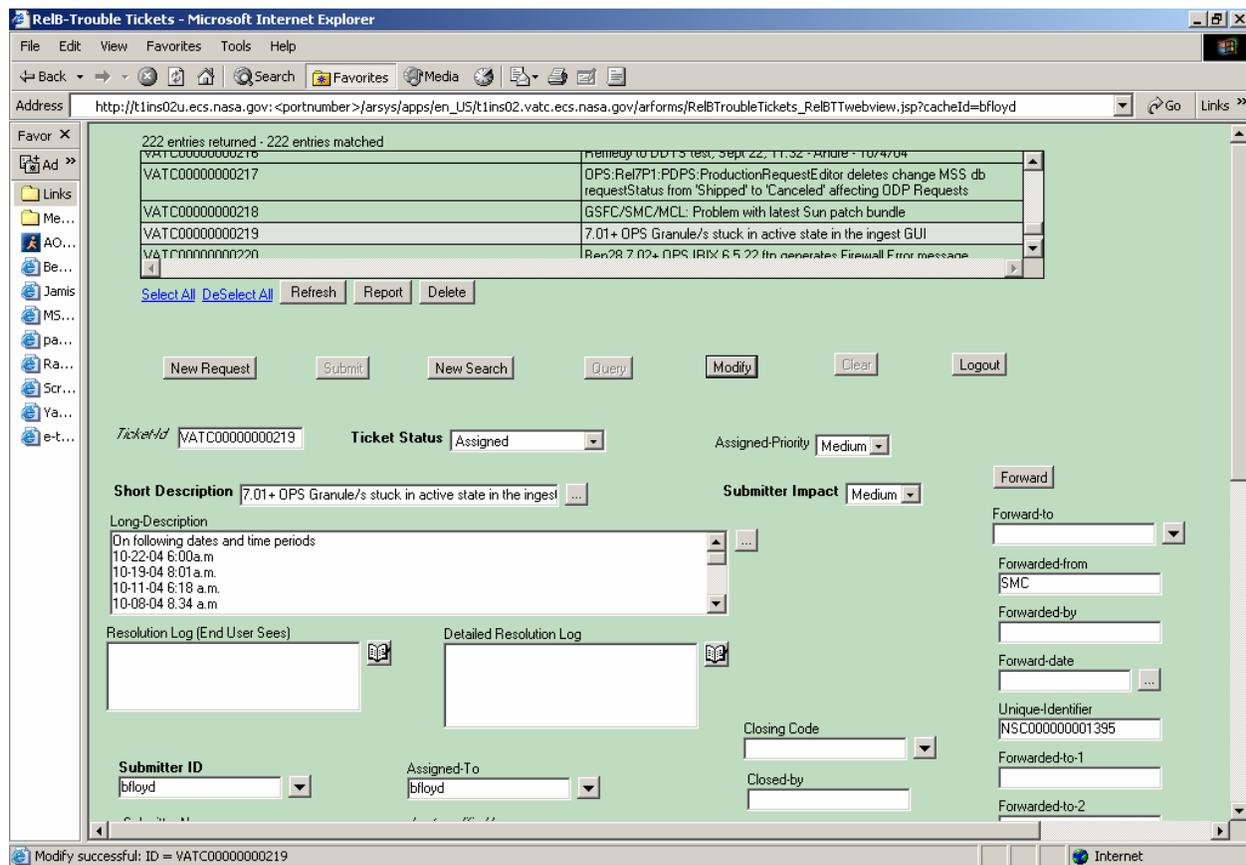


Figure 4.3.6-20. Remedy Trouble Tickets Form's (Query Results) Web View

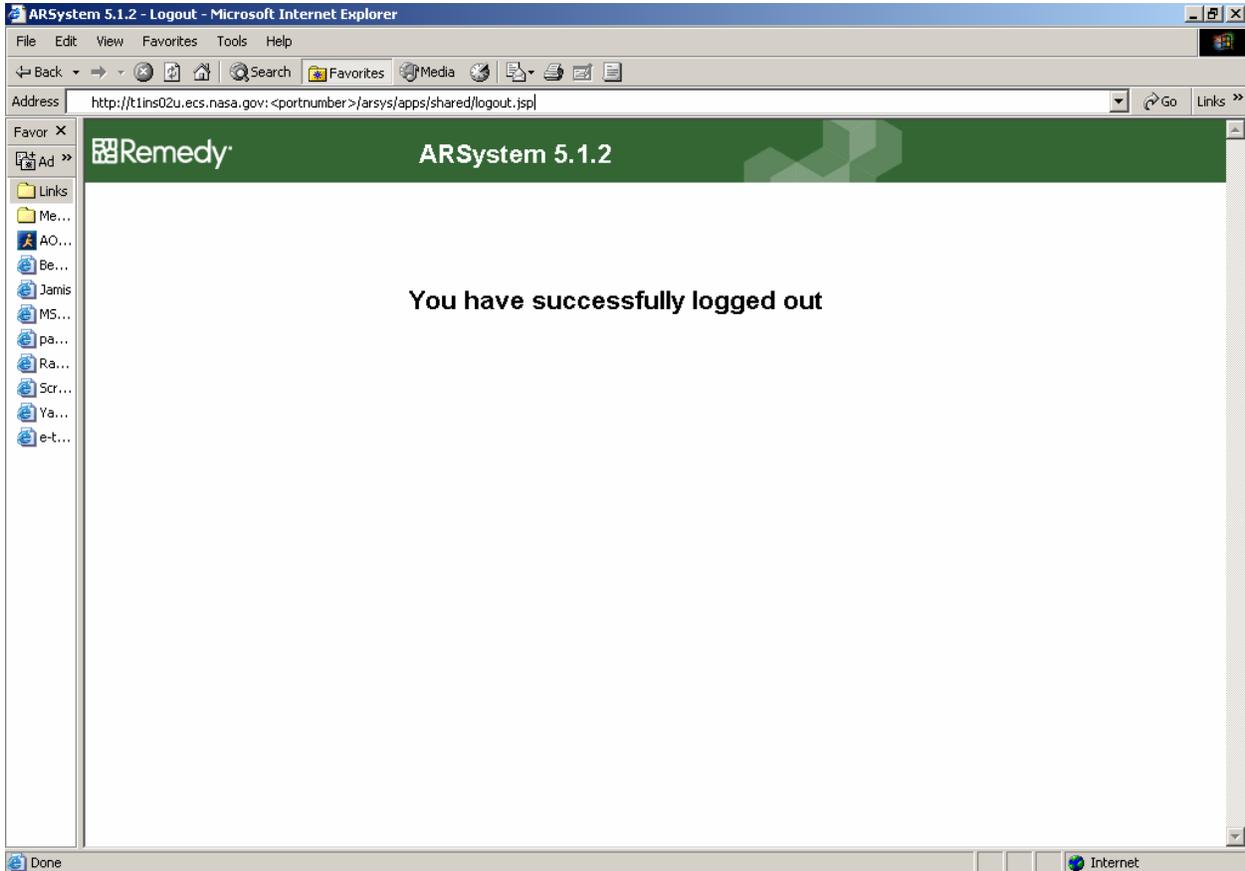
- Refresh – enables one to redisplay the contents of the Results List and any changes that occurred to items (meeting the search criteria), after the initial display, will now be reflected in the new display;
- Report – (not used) the Trouble Ticket Web view is not set up to execute this feature;
- Delete – enables a Remedy administrator to delete the selected record(s). Note, use this function with caution, once deleted, a record cannot be restored.

Additionally in the Query Results window, the contents of one of the trouble tickets are displayed and the Modify button is now activated. At this point, one can make changes to the displayed trouble ticket or select another trouble ticket and have it displayed. Once changes are entered, click the **Modify** button and the changes are then sent to the database. The Status of the submitted changes is displayed in the bottom left part of the window as shown in Figure 4.3.6-21.



**Figure 4.3.6-21. Trouble Ticket Web View (Change Submission Results)**

Upon completion of all transactions, click the **Logout** button to close the Trouble Ticket Form and the window shown in Figure 4.3.6-22 is displayed.



**Figure 4.3.6-22. Trouble Ticket Form Web View (Logout)**

### **4.3.6.3 Required Operating Environment**

For Remedy ARS 5.1.2, appropriate information on operating environments, tunable parameters, environment variables, and a list of vendor documentation can be found in 914-TDA-280-Rev01, “Remedy ARS 5.1.2 Upgrade and Installation of J2SDK 1.4.1\_07 for the EOSDIS Core System (ECS).”

#### **4.3.6.3.1 Interfaces and Data Types**

Remedy’s Action Request System exchanges data of various types through interfaces within and external to ECS. Table 4.3.6-16 lists Remedy’s Action Request System interfaces.

**Table 4.3.6-16. External Interface Protocols**

Interface (facility)	Type of Primary Interface Protocols	Type of Backup Interface Protocols	Comments
Forwarding	E-mail	Default E-mail Backup Interface Protocols	Site to site forwarding of Trouble Tickets.
Remedy 5.1.2 Mid Tier, Web Capability	HTTP	Default HTTP Backup Interface Protocols	End user submission and queries.

#### 4.3.6.4 Databases

Remedy's Action Request System is installed on Sybase; it creates, modifies, and deletes tables as forms are created, modified, and deleted with each column corresponding to a field in the forms. This is all done automatically and is invisible to the user.

#### 4.3.6.5 Special Constraints

Note that while Trouble Tickets and the Contact Log forms are open to all operators, and operators have view privileges to the user form, only system administrators have the ability to modify the form and tools presented in this section. Privileges are set according to DAAC policy.

#### 4.3.6.6 Outputs

PC or Unix client output from Remedy's Action Request System (besides output to the screen in the form of its GUIs) is in the form of a report either to the printer or to a file (reports discussed in Section 4.3.6.8) or a log entry as shown in Table 4.3.6-17. Output from the Web view is to the screen only.

Using the Remedy PC **Admin** tool, you may enable / disable logging at any time. Select Start -> Programs -> Action Request System -> AR System Administrator. Login to the Remedy administrator tool. Then click File -> Server Information -> Log Files (tab) to display the current location of log files that have been enabled. The format of the messages is similar to the Unix syslog as seen in this example:

**Table 4.3.6-17. Remedy Error Log File Messages Example**

```
Tue May 11 10:57:03 2004 390600 : Failure while trying to connect to the SQL database.
Please ensure the SQL database is running or contact the Database Administrator for help (ARERR 550)
Tue May 11 10:57:03 2004 ct_close(FORCE): user api layer: external error: There is a usage error. This routine
has been called at an illegal time. (Sybase 16843068) :
Tue May 11 10:57:05 2004 390600 : Cannot initialize contact with SQL database (ARERR 551)
```

#### 4.3.6.7 Event and Error Messages

For Remedy's Action Request System's system messages see the *Remedy Action Request System 5.1 Error Message Guide*.

Table 4.3.6-18 lists non-system failure related messages, which appear on the operator's screen.

**Table 4.3.6-18. Non-Failure Related Error Messages**

<b>Error Message String</b>	<b>Cause</b>	<b>Action</b>
You have to assign the trouble ticket to somebody	Setting the Status to Assigned without setting the Assigned-to field.	Set Assigned-to field.
You have to assign a Closing Code to close	Setting Status to Closed without a Closing Code.	Set Closing Code field.
Trouble Ticket number \$Ticket-Id\$ has already been forwarded to or otherwise opened at \$Forward-to\$	Already forwarded Trouble Ticket to site in Forward-to field.	Check Forward-to site name against the sites that have already been forwarded the Trouble Ticket.
Must change status to "Forwarded" and fill in the "Forward-to" field	Must set the indicated fields before the Trouble Ticket can be forwarded.	Check Forward-to and Status fields to ensure they have the appropriate values.
There is not an Associated Contact Log Id for this Trouble Ticket	Trying to access a Contact Log not associated with a Trouble Ticket through the RelB-Trouble Tickets form.	You can't access the Contact Log for this Trouble Ticket because it does not exist.
There has not been a Trouble Ticket created for this log	Trying to access a Trouble Ticket not associated with a Contact Log through the RelB-Contact Log form.	You can't access the Trouble Ticket for this Contact Log because it does not exist.
A Trouble Ticket is not created. A Trouble Ticket has already been opened for this log	Trying to create a Trouble Ticket via the Contact Log that has already been created.	You can't open a Trouble Ticket for this Contact Log since one has already been opened.
A Trouble Ticket cannot be created. Contact Id required for Trouble Ticket submission	Contact ID is required for creation of a Trouble Ticket via the Contact Log.	Set the Contact ID field.
A Trouble Ticket cannot be created without a Log Id	Trying to create a Trouble Ticket via a Contact Log that has not yet been saved and hence has no Contact ID.	Select Apply to assign a Log ID then try and create a Trouble Ticket again.

#### 4.3.6.8 Reports

The Remedy Action Request System issues the reports described in Table 4.3.6-19.

**Table 4.3.6-19. Reports**

<b>Report Type</b>	<b>Report Description</b>	<b>When and Why Used</b>
Ticket Status Report	Indicates the status of a set of trouble tickets based on a particular criteria (e.g., by date range, assigned-user, status...).	When and if someone wants to know the status of a set of trouble tickets based on a particular criterion (e.g., by date range, assigned-user, status...).
Hardware Resource Report	Indicates by hardware resource, the number of problems encountered by the affected hardware resource.	When and if someone wants to know, by hardware resource, the number of problems encountered.
Trouble Ticket User Report (Number of Tickets by Submitter)	Indicates by submitter, the number and type of trouble tickets in the system.	When and if someone wants to know, by submitter, the number and type of trouble tickets in the system.
Trouble Ticket Statistics Report (Average Time to Close)	Indicates for a particular criterion, statistical information such as mean time to close.	When and if someone wants to know, for a particular criterion, statistical information such as mean time to close.
Number of Trouble Tickets by Status	Provides a summary of the number of tickets by status.	When and if someone wants to know a summary of the number of tickets by status.
Number of Tickets by Assigned Priority	Provides a summary of the number of tickets by priority.	When and if someone wants to know a summary of the number of tickets by priority.
Trouble Ticket Status Report (SMC)	Provides a summary of the tickets by status for importing into Excel.	When and if someone wants to import a summary of the tickets into Excel.
Custom reports	TTS allows for both extensive customization of the above reports and creation of new ones. The reporting capabilities include the capability to display not only data contained in the database but also statistical and correlation functions on that data.	When and if someone wants to know more than is available through the previous reports.

#### **4.3.6.8.1 Sample Reports**

The following are examples of sample reports that can be generated from the Trouble Ticket form using a PC or Unix Remedy client. These sample reports (Figures 4.3.6-23 through 4.3.6-29) include: Ticket Status, Hardware Resource, Number of Tickets by Submitter, Average Time to Close, Number of Trouble Tickets by Status, Number of Tickets by Assigned Priority, and a Summary Report (for import into Excel).

<b>Ticket Status Report</b>	
Ticket Status	Ticket-Id
-----	-----
New	TT00000000000148
	TT00000000000139
	TT00000000000142
	TT00000000000146
	TT00000000000144
	TT00000000000147
Sum = 6	
Ticket Status	Ticket-Id
-----	-----
Assigned	TT00000000000149
Sum = 1	
Ticket Status	Ticket-Id
-----	-----
Closed	TT00000000000143
Sum = 1	
*****	

**Figure 4.3.6-23. Trouble Ticket Status Report**

## Hardware Resource Report

```
Hardware Resource
-----
slimer
Number of Associated Tickets = 1

epserver
Number of Associated Tickets = 4

cyclops
Number of Associated Tickets = 3
*****
```

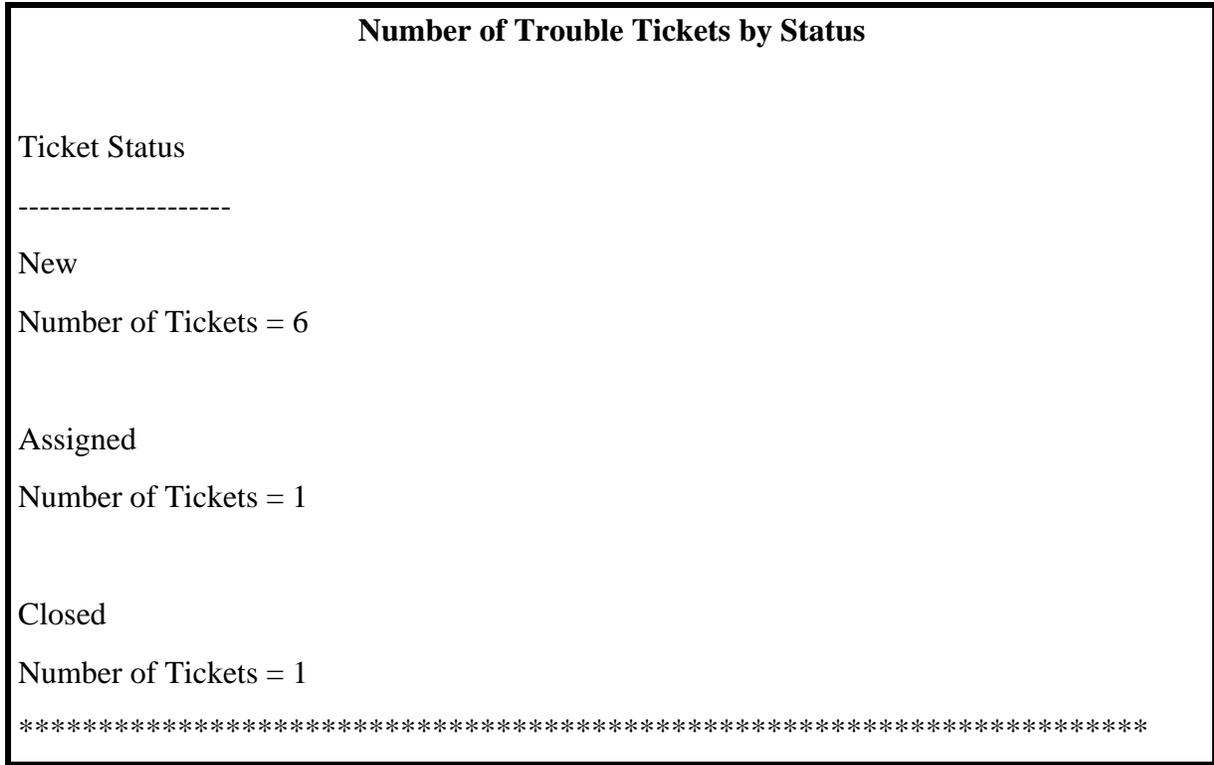
**Figure 4.3.6-24. Hardware Resource Report**

Number of Tickets by Submitter	
Submitter ID	Ticket-Id
-----	-----
Demo	TT00000000000139
	TT00000000000142
	TT00000000000143
	TT00000000000144
Total Submitted = 4	
Joe Operator	TT00000000000148
	TT00000000000149
Total Submitted = 2	
dmiller	TT00000000000146
	TT00000000000147
Total Submitted = 2	
*****	

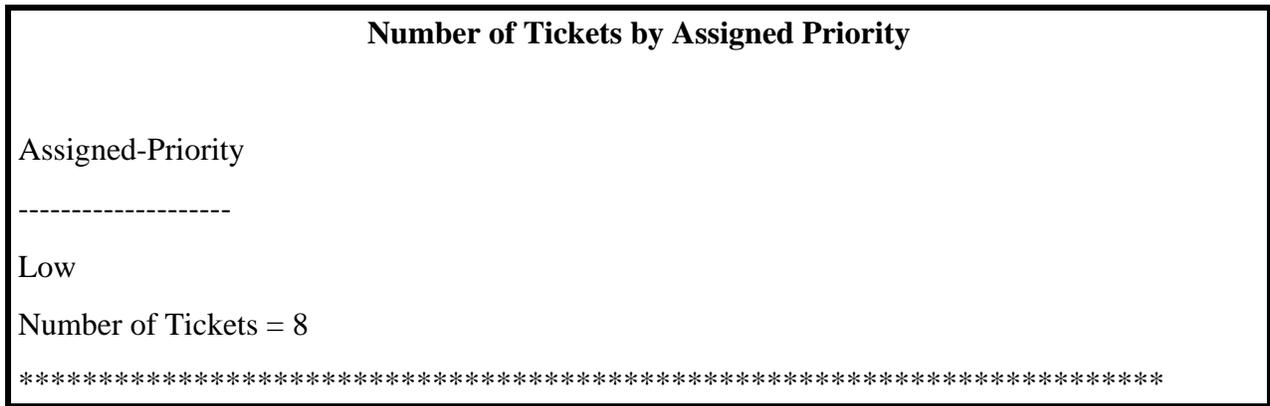
**Figure 4.3.6-25. Number of Tickets by Submitter Report**

Average Time To Close
Average Time To Close a Trouble Ticket = 0:04:22
*****

**Figure 4.3.6-26. Average Time to Close Report**



***Figure 4.3.6-27. Number of Tickets by Assigned Status Report***



***Figure 4.3.6-28. Number of Tickets by Assigned Priority Report***

**Summary Report to be imported into Excel (comma separated values)**

```
"Ticket-Id","Assigned-Priority","Closing Code","Current Site","Hardware Resource","Key Words","ProblemType","SoftwareResource","TicketStatus","New.TIME","Assigned.TIME","SolutionProposed.TIME","ImplementSolution.TIME","SolutionImplemented.TIME","Closed.TIME","Forwarded.TIME","Work Around.TIME","Not Repeatable.TIME"
"TT0000000000139","Low",,"cyclops","cyclops",,,"New","05/22/96 11:06:44",,,,,,"","","","","","","",""
"TT0000000000142","Low",,"cyclops","cyclops",,,"New","05/23/96 10:13:14",,,,,,"","","","","","",""
"TT0000000000143","Low","ConfigurationError","cyclops","cyclops",,,"Closed","05/28/96 10:36:27",,,,,,"05/28/96 10:40:49","05/28/96 10:40:54",,,,,,""
"TT0000000000144","Low",,"cyclops","epserver",,,"New","05/30/96 09:25:44",,,,,,"","","","","","",""
"TT0000000000146","Low",,"cyclops","epserver",,,"New","05/30/96 13:47:53",,,,,,"","","","","","",""
"TT0000000000147","Low",,"cyclops","epserver",,,"New","05/30/96 13:48:18",,,,,,"","","","","","",""
"TT0000000000148","Low",,"cyclops","epserver",,,"New","05/31/96 11:54:28",,,,,,"","","","","","",""
"TT0000000000149","Low",,"cyclops","slimer",,,"Assigned","06/07/96 14:06:17",,,,,,"14:04:03","06/07/96"
*****
```

**Figure 4.3.6-29. Summary Report**

**4.3.6.8.2 Report Customization**

Reference the AR System User tool's Help menu for information on creating and customizing reports. To get to the Help menu click Start -> Programs -> Action Request System -> AR System User Help -> Contents (tab) -> Reports.

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