**software** AG

# Natural Engineer

## Application Management for Unix

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**ADABAS & NATURAL**

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## Acknowledgements

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# ABOUT THIS MANUAL

## Purpose of this manual

This manual covers the Application Management for Natural Engineer.

It describes the various processes available that enable you to create and manage Natural applications within Natural Engineer.

The topics cover the Application options found under the Application menu, which include:

- How to create new applications, open existing applications and delete applications.

- Customizing the control of the application by setting preferences.

Also covered, are all the options to Extract and Load your Natural applications from the Natural application library into the Repository. An overview of the reporting available for these functions is also provided.

## Target Audience

The target audience for this manual is intended to be any User of Natural Engineer at any level of experience.

# Typographical Conventions used in this manual

The following conventions are used throughout this manual:

| | |
|---|---|
| **UPPERCASE TIMES** | Commands, statements, names of programs and utilities referred to in text paragraphs appear in normal (Times) uppercase. |
| `UPPERCASE BOLD COURIER` | In illustrations or examples of commands, items in uppercase bold courier must be typed in as they appear. |
| < > | Items in angled brackets are placeholders for user-supplied information. For example, if asked to enter <file number>, you must type the number of the required file. |
| Underlined | Underlined parts of text are hyperlinks to other parts within the online source manual. This manual was written in MS-Word 97 using the "hyperlink" feature. |

The following symbols are used for instructions:

| | |
|---|---|
| $\Rightarrow$ | Marks the beginning of an instruction set. |
| o | Indicates that the instruction set consists of a single step. |
| 1. | Indicates the first of a number of steps. |

# How this manual is organized

This manual is organized to reflect all the Application Management options of Natural Engineer in the following chapters:

| Chapter | Contents |
| --- | --- |
| 1 | Describes the various options available to select and delete applications, and set up preferences that define the application environments. |
| 2 | Describes the various extract and load processes available within Natural Engineer that allow you to load your applications into the Repository. |
| 3 | Describes the various options to augment and maintain the information in the repository. This includes the Soft Links option to specify object link information and the Object Documentation option which allows you to specify comments for each object within an application on the Repository. This complements the object source code information already stored in the Repository. |
| 4 | Provides an overview of the reporting options available for the topics covered in this manual. |

# Terminology

This section offers some of the terms that are specific to the Natural Engineer product.

*Note: Familiarity is assumed with the general terminology of Natural, Adabas, Microsoft and Mainframe operating systems.*

**Analysis**

The Analysis process of Natural Engineer searches application data within the Natural Engineer Repository, according to specified Search Criteria and generates reports on the search results.

**Application**

An Application is a library or group of related libraries, which define a complete Application. In Natural Engineer, the Application can have a one-to-one relationship with a single library of the same name, or a library of a different name, as well as related steplibs. The Application refers to all the source code from these libraries, which Natural Engineer loads into the Repository.

**Browser**

An Internet Browser such as Microsoft Internet Explorer or Netscape.

**Category**

Categories in Natural Engineer specify whether and how a Modification is applied to the Natural code. Valid categories are: Automatic change, Manual change, Reject the default Modification, No change to the data item, and the data item is in Generated Code.

A category is further broken down according to type of change (for example: Keyword, Literal, Data Item, Database Access, Definition).

**Cobol**

Abbreviation of Common Business Orientated Language. A programming language.

**Cobol Link**

A Cobol Link is the link between the individual Cobol modules and the executable Cobol program referenced in the JCL object.

**Consistency**

An option in the Analysis process that causes Natural Engineer to trace an Impact through the code, using left and right argument resolution to identify further code impacted by the code found.

**Data Item**

A collective term used for any data fields within a programming object. These can be user-defined variables, DDM fields or System Variables. It is inter-changeable with the term 'variable'.

**Environment**

The Environment process is the means by which Natural Engineer generates a structured view of the application code in the Natural Engineer Repository. This provides application analysis reports and inventory information on the application and is used as the basis for Impact Analysis.

**Exception**

An Exception is an Item identified as impacted that does not require a Modification. Where there are a few similar Exception Items, they can be treated as Exceptions, and rejected in the Modification review process. Where there are many similar (therefore not Exceptions), consideration should be given to changing the Search Criteria so they are not identified as impacted in the first place.

**Generated Code**

This is code which has been generated by a Natural code generator, such as Construct, and which is not normally modified directly in the Natural editor.

**Impact**

An Impact is an instance of a Natural code Item; e.g., data item or statement (a "hit" scored by the Analysis process) that matches the defined Search Criteria used in the Analysis process.

**Iteration**

An Iteration is one examination cycle of a field identified according to the specified Search Criteria. For example, one Iteration is reading the field right to left. Multiple Iterations are performed when the option of 'Consistency' or Multi Search is requested for Analysis, and Natural Engineer performs as many Iterations as necessary to exhaust all possibilities of expressing and tracing the field, and can be limited by a setting in the NATENG.INI file.

**JCL**

Job Control Language.

**JCL object**

A JCL object is a collection of Job Control statements in the order which they are to be executed in a mainframe batch environment. Commonly referred to as JCL.

**Library**

A single library of source code, which exists in the Natural system file.

**Modification**

A Modification is a change suggested or made to an object or data item resulting in the required compliance of that object or data item. Modifications in Natural Engineer are classified according to Category and Type.

**Natural Engineer Application Management**

**Refactoring**

Improving a computer program by reorganizing its internal structure without altering its external behavior.

**Soft Link**

A Soft Link is where a link between two objects has been defined using an alphanumeric variable rather than a literal constant.

**TLM**

Text Logic Members are used to contain the code required to support inclusion of common code into the application. An example of this is the code to include into an application before updating a database.

**Type**

The Type of Modification available, for example: Data Item, Keyword and Literal.

**Variable**

A collective term used for any data fields within a programming object. These can be user-defined variables, DDM fields or System Variables. It is inter-changeable with the term 'data item'.

# Related Literature

The complete set of Natural Engineer manuals consists of:

**1 Natural Engineer Concepts and Facilities (NEE83-006ALL)**

The Concepts and Facilities manual describes the many application systems problems and solutions offered by Natural Engineer, providing some guidelines and usage that can be applied to Natural applications.

**2 Natural Engineer Release Notes (NEE83-008ALL)**

The Release Notes describe all the information relating to the new features, upgrades to existing functions and documentation updates that have been applied to Natural Engineer.

**3 Natural Engineer Installation Guide for Windows (NEE83-010WIN)**
**Natural Engineer Installation Guide for Mainframes(NEE83-010MFR)**
**Natural Engineer Installation Guide for Unix (NEE83-010UNX)**

The Installation Guide provides information on how to install Natural Engineer on PC, Unix and mainframe platforms.

**4 Natural Engineer Administration Guide (NEE83-040WIN)**
**Natural Engineer Administration Guide (NEE83-040MFR)**

The Administration Guide provides information on all the various control settings available to control the usage of the different functions within Natural Engineer.

**5 Natural Engineer Application Management (NEE83-020WIN)**
**Natural Engineer Application Management (NEE83-020MFR)**

The Application Management manual describes all the functions required to add Natural applications into the Repository.

**6 Natural Engineer Application Documentation (NEE83-022WIN)**
**Natural Engineer Application Documentation (NEE83-022MFR)**

The Application Documentation manual describes all the available functions to document a Natural application within the Repository. These functions will help enhance / supplement any existing systems documentation such as BSD / CSD / Specifications etc.

**7 Natural Engineer Application Analysis and Modification (NEE83-023WIN)**
**Natural Engineer Application Analysis and Modification (NEE83-023MFR)**

The Application Analysis and Modification manual describes all the available functions to carry out analysis of Natural applications; including basic keyword searches. The modification process is described and detailed to show how it can be applied to modify single selected objects within a Natural application, or the entire Natural application in one single execution.

**Natural Engineer Application Management**

**8** **Natural Engineer Application Restructuring (NEE83-024WIN)**
**Natural Engineer Application Restructuring (NEE83-024MFR)**

The Application Restructuring manual describes the analysis and modification functionality required to carryout some of the more sophisticated functions such as Object Builder.

**9** **Natural Engineer Utilities (NEE83-080WIN)**
**Natural Engineer Utilities (NEE83-080MFR)**

The Utilities manual describes all the available utilities found within Natural Engineer and, when and how they should be used.

**10** **Natural Engineer Reporting (NEE83-025ALL)**

The Reporting manual describes each of the reports available in detail, providing report layouts, how to trigger the report and when the report data becomes available. The various report-producing mediums within Natural Engineer are also described.

**11** **Natural Engineer Batch Processing [Mainframes] (NEE83-026MFR)**

The Batch Processing manual describes the various batch jobs (JCL) and their functionality.

**12** **Natural Engineer Messages and Codes (NEE83-060ALL)**

The Messages and Codes manual describes the various messages and codes produced by Natural Engineer.

**13** **Natural Engineer Web Interface Installation and Configuration Guide(NEA83-010ALL)**

The Web Interface Installation and Configuration Guide provides information on how to install and configure the Natural Engineer Web Interface.

**14** **Natural Engineer Advanced Services (NEE83-017WIN)**

The Advanced Services manual describes various advanced options such as the Refactoring of Natural application source code with Natural Engineer, conversion of applications for Natural for Ajax and Business Rule processing.

# MANAGING APPLICATIONS

## Chapter Overview

This chapter describes how to select and manage applications for processing in Natural Engineer, and how to set up preferences for the applications.

In the context of Natural Engineer, 'Application' is as described in the Terminology section and is the name Natural Engineer uses to describe a library or set of related libraries.

An Application is a library or group of related libraries that define a complete Application. In Natural Engineer, the Application can have a one-to-one relationship with a single library of the same name, or a library of a different name, as well as related steplibs. The Application refers to all the source code from these libraries, which Natural Engineer loads into the Repository.

The following options are available from the Application menu and are described in this chapter:

1.  **Select an Application**

Open an existing Application or define a new Application.

2.  **Delete an Application**

Delete an Application from Natural Engineer.

3.  **Delete Object**

Delete an object from the Natural Engineer Repository.

4.  **Properties**

Define Application preferences and defaults.

# Select an Application

Use this option either to select a previously processed application from the list, or to specify a new application.

This is accessed by selecting option 'S' (Select an Application) from the Application Menu screen which will open the Select Application screen, where an existing application can be selected or a new application name typed in.

*Note: For a new application, if the application name you want to use in Natural Engineer is different from the library name in the FUSER, you will have to set the Natural Library parameter in the Properties screen to the FUSER library name. For more information see the Application Properties section in this chapter.*

*Note: User Exit NEEUEX5 has to be available in the SYSNEE library in order for new application names to be created. This user exit may be modified if you wish to generate application names automatically. If it is not present in the SYSNEE library then NEEUEX5X needs to be renamed to NEEUEX5.*

The following Figure 1-1 illustrates the Select Application screen.

```
                   - Select Application -

                Application:  HOSPITAL

              Sel  Applications
                _     TST13900
                _     TST22100
                _     TST22300
                _     TST23100
                _     TS170101
                _     TS170103
                _     TS170104
                _     TS170106
                _     TS170401
                _     TS170501
                _     TS170601
                _     TS170603

            Reposition ->  _____

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help       Exit                      Prev  Next                      Main
```

**Figure 1-1 Select Application screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| Application | The name of the application to be opened. This will be pre-filled with the currently selected application or blank if no previous application has been selected. |
| | This field can be used to specify a new application name or type in the name of an existing application. |
| Sel | Selects the application. Valid values are: |
| | '**S**'   Select. |
| Applications | List of all the available applications on the Repository. |
| Reposition | Reposition the list of objects starting from the new value entered. The reposition value can be input using either a complete name or part name using an '*' (asterisk) wildcard. For example: |

| Value | Result |
|---|---|
| * | Will reposition at the start of the Object list. |
| | For the HOSPITAL system, this would start the object list from object XXCONPDA. |
| XXE* | Will reposition at the first object name that matches the mask XXE or is greater than the mask input. |
| | For the HOSPITAL system, this would start the object list from object XXEXIT. |
| XX000G01 | Will reposition at the first object name that matches the mask exactly or is greater than the object name input. |
| | For the HOSPITAL system, this would start the object list from object XX001L01 as object XX000G01 does not exist. |

| PFKEYS | DESCRIPTION |
|---|---|
| PF1 | Activates the help function. |
| PF3 | Exit from the current function and return to previous screen. |
| PF7 | Displays previous page. |
| PF8 | Displays next page. |
| PF12 | Returns to the Natural Engineer Main Menu. |

# Delete an Application

This option allows you to delete an Application that exists in Natural Engineer. You have to select the Application from the Select an Application screen first.

All application data will be removed from the Natural Engineer Repository. This deletes all Application, Analysis and Modification information.

This is accessed by selecting option '**D**' (Delete an Application) from the Application Menu screen. This will open the NATRJE Job Submission screen.

The following Figure 1-2 illustrates the NATRJE submission screen for the Delete an Application option.

```
                      - Job Submission -        Application: HOSPITAL

           Job Selection details
           -------------------
               Job Selected  :  (APPDEL) APPLICATION DELETE

           Job Card details
           ---------------
               Job Name  :  XGSLXX__
               Job Class :  _


           Job Control Record details
           ------------------------
           Control Status  :
           Last Job Submitted
             Job Name :
                 Opid :
                 Step :
           Return Code :



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help        Exit        Sub  Ref                 Rel              Main
```

**Figure 1-2 NATRJE Job Submission screen**

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Delete Object

This allows you to select objects for deletion from the Natural Engineer Repository, with confirmation.

Use this option to remove object data from the Natural Engineer Repository. This deletes Application, Analysis and Modification information for the object.

*Note: If the object is to be deleted permanently from the application Repository, you must also delete it from the source library, so that it is not re-extracted by error in the future.*

This is accessed by selecting option '**O**' (Delete Object) from the Application Menu screen.

This will open the Delete Objects selection screen, where all the objects loaded for the currently selected application are listed. From here objects can be selected for deletion.

The following Figure 1-3 illustrates the Delete Objects screen.

```
                        - Delete Objects -        Application: HOSPITAL

      Select  Object                          Object Type
        _     PATIENT                         Data Defn. Module
        _     XXCONPDA                        Parameter Data Area
        _     XXCONUPD                        Subprogram
        _     XXEMPMAP                        Map
        _     XXEXIT                          Subroutine
        _     XXGETID                         Subprogram
        _     XXMTHVAL                        Local Data Area
        _     XXTIDYUP                        Program
        _     XXVALCC                         Copycode
        _     XX000G00                        Global Data Area
        _     XX001L01                        Local Data Area
        _     XX001M01                        Map
        _     XX001P01                        Program
        _     XX002L01                        Local Data Area
 Reposition -> _____
 Object Lang.  N Natural


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help         Exit        Sub   Exe   Prev  Next        SelPg Sel*  Main
```

**Figure 1-3 Delete Objects screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Application** | The name of the currently selected application. |
| **Select** | Selects the object. Valid values are:<br>'**S**'  Select. |
| **Object** | List of all the available objects for the currently selected application. |
| **Object Type** | The object type of the particular object. |
| **Reposition** | Reposition the list of objects starting from the new value entered. The reposition value can be input using either a complete name or part name using an '*' (asterisk) wildcard. For example: |

| Value | Result |
|---|---|
| * | Will reposition at the start of the Object list.<br>For the HOSPITAL system, this would start the object list from object XXCONPDA. |
| XXE* | Will reposition at the first object name that matches the mask XXE or is greater than the mask input.<br>For the HOSPITAL system, this would start the object list from object XXEXIT. |
| XX000G01 | Will reposition at the first object name that matches the mask exactly or is greater than the object name input.<br>For the HOSPITAL system, this would start the object list from object XX001L01 as object XX000G01 does not exist. |

| | |
|---|---|
| **Object Lang.** | Allows you to select the programming language of the objects to be listed. Where only a single language exists within a selected application, this field will be non-modifiable.<br>Available selections are:<br>'*'  All<br>'**C**'  Cobol<br>'**N**'  Natural<br>'**J**'  JCL |

| PFKEYS | DESCRIPTION |
|---|---|

| PFKEYS | DESCRIPTION |
|--------|-------------|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Will present a list of objects selected to be deleted for review. Confirming the object list will invoke the Object Deletion batch job via the NATRJE Job Submission screen. |
| **PF6** | Will produce a pop-up confirmation window to delete the objects interactively. |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF10** | Will select all objects on the current page for deletion. |
| **PF11** | Will select all objects within the application for deletion. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

Once an object or multiple objects have been selected, use the '**PF6**' key to invoke the interactive deletion process. This will produce a pop-up confirmation window. Enter '**Y**' to delete the selected object or '**N**' to cancel deletion. To delete the objects in batch via the NATRJE Job Submission screen use the **'PF5'** key.

The following Figure 1-4 illustrates the Delete Object confirmation pop-up window.

```
                        - Delete Objects -       Application: HOSPITAL

      Select  Object                          Object Type
       _      PATIENT                         Data Defn. Module
       _      XXCONPDA                        Parameter Data Area
       S      XXCONUPD                        Subprogram
       _      XXEMPMAP                        Map
              XXEXIT                          Subroutine
        ┌──────────────────────────────────────────────────────┐
        │                                                        │
        │   Object XXCONUPD to be Deleted?                       │
        │                                                        │
        │   _  (Y/N)                                             │
        │                                                        │
        │                                                        │
        └──────────────────────────────────────────────────────┘

          Reposition -> _____
          Object Lang. * All

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub   Exe   Prev  Next       SelPg Sel*  Main
```

**Figure 1-4 Delete Object confirmation pop-up window**

# Application Properties

The Application Properties screen allows you to define the preferences that are to be applied during the extract and modification processes within Natural Engineer.

For example, applications that make use of steplibs.

If an application makes use of steplibs, then these can be specified on the Application Properties screen. This may be applicable where applications make use of standard routines which are held on a separate natural library rather than including them within the application natural library.

This is accessed by selecting option '**P**' (Properties) from the Application Menu screen.

The following Figure 1-5 illustrates the Application Properties screen.

```
                - Set Properties -          Application: HOSPITAL

  Extract Environment: MVS_____ Decimal Char.: . Input Char.: ,
   Master Application: _____

      Natural Library:  _____  Sys File Alias _____
                  PAC  _____
               STATUS  _____
                                  Sys File Alias
             *STEPLIB:  HOSP____   DEV_____
             Steplibs:  HOSPSTEP   DEV_____
                        _____   _____
                        _____   _____
                        _____   _____
                        _____   _____
                        _____   _____
                        _____   _____
                        _____   _____
  Modification Library:  _____  _____ Modify To Steplib: N

 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help       Exit       Save                  Cobol JCL           Main
```

**Figure 1-5 Application Properties screen**

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |

Items applicable to all Languages:

| **Extract Environment** | This is a documentation facility used by Natural Engineer's Reengineering functions, which specifies the application environment from which the source code comes. Available selections are: |
| --- | --- |
| | **Windows NT** |
| | **Windows 2000** |
| | **Windows 7** |
| | **Windows XP** |
| | **Windows 2003 Server** |
| | **Windows 2008 Server** |
| | **MVS** |
| | **Unix** |
| | **VMS** |
| | **BS2000** |
| | **VSE** |
| **Decimal Char** | The decimal character used by the application. |
| | For new applications, the default value will be based on the Natural environment settings in use. |
| **Input Char** | The input data delimiter used by the application. |
| | For new applications, the default value will be based on the Natural environment settings in use. |
| **Master Application** | If a Master Application is selected then all Application Properties definitions e.g., Steplibs, Source Library and settings will be copied from the Master Application to this application. |

Items applicable to Natural Language only:

| **\*STEPLIB** | The master steplib library name assigned to the Natural system variable \*STEPLIB. This is normally set to SYSTEM. |
| --- | --- |
| **Steplibs** | This option allows you to define multiple Steplib libraries from which Natural Engineer can retrieve objects referenced from the primary Natural library. |
| | You can define up to 8 steplib Natural library names that Natural Engineer will search for the application code. |
| | *Note: A steplib library name cannot be the same as the Application name, the \*STEPLIB name, the Source library name or the Modification library.* |
| | Natural Engineer will search the steplib chain for the following items if they do not exist on the base library: |
| | **Data Areas**      (LDAs, PDAs GDAs) |

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| | **Copycode** |
| | **Subprograms** (invoked via CALLNAT) |
| | **Programs** (invoked via FETCH/FETCH RETURN/FETCH REPEAT) |
| | **Maps** (invoked by INPUT USING MAP/WRITE USING FORM) |
| | **Helproutines** (invoked via HE=) |
| | **Objects** (invoked via STACK TOP COMMAND/STACK COMMAND) |
| | **DDMs** |

*Note: For the STACK command, Natural Engineer will attempt to determine if the command that is being stacked is an actual object or not. It does this by interrogating an exclude table that lists common commands that are not objects e.g. STOW, EDIT.*

*Note: If a PAC application is selected, then Steplib selection is not available.*

| | |
|---|---|
| **Natural Library** | If the Natural Engineer Application name is to be different from the library name in the FUSER, specify the actual FUSER library name in the Natural library field. If a Natural Library is not specified, Natural Engineer assumes that the application name is the same as the FUSER library name. |
| **PAC** | The name of a PAC application. |
| | A PAC application name can be typed in, or, by using '?' in the first byte to invoke a list of PAC Applications to select from. |
| | *Note: This option is only available if Natural Engineer is executing in a mainframe environment and PAC version 2.4.2 or above is installed.* |
| **STATUS** | The name of the PAC status related to the PAC application. If no status is selected then Natural Engineer will select the latest version of the objects from the PAC application regardless of status. |
| **Modification Library** | Used to specify a library that the modified code will be written to. |
| | If a Modification Library is not specified Natural Engineer places all modified code in a library name with an 'X' as the last character of the application name. If the name is already 8 characters long, the last character is removed and replaced with the 'X'. |
| | The Modification Library name can be the same as the base Natural Library name. This allows any modified objects from the modification process to be applied to the base Natural Library. If this is set, a warning message is produced to highlight that the base Natural Library will be |

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| | updated. |
| | *Note: If a PAC application is selected, then the Modification Library will default to the first maintenance library found within the PAC application. This can be changed to any library name as required.* |
| **Modify to Steplibs?** | This option allows you to specify where objects that are on steplib libraries are to be modified, either to the Steplib library or the application Modification library. |
| | 'N'    Modify all objects to the application Modification library.<br>'Y'    Modify steplib objects in the application to the steplib Modification library. |
| **Sys File Alias** | The alias for the particular database number/file number combination where the Natural System File for the source library is located. |
| | *Note: The aliases for Modification Libraries shown are those that are identified as Modifiable in Global Properties. For steplibs and Natural Library any alias specified in Global Properties may be defined.* |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Application Properties. |
| **PF9** | Invoke the Application Properties for Cobol. |
| **PF10** | Invoke the Application Properties for JCL. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

*Note: Please see the Global Properties section of the Natural Engineer Administration Manual for further information on setting System File aliases.*

## Application Properties - Cobol

The Cobol Application Properties option is accessed by selecting '**PF9' Cobol** from the Application Properties screen. It allows for the definition of Source, Steplib and Map PDS names for Cobol objects if applicable. The extract process will select the objects from the PDS in the order in which they are specified.

The following Figure 1-6 illustrates the Cobol Application Properties screen.

```
                        - Cobol PDS -          Application: HOSPITAL

              Alias       PDS Name
   Source     _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____


   Steplibs   _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____
              _____    _____


   Maps       _____    _____

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Apply
```

**Figure 1-6 Cobol Application Properties screen**

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |
| Cobol Source group: | |
| **PDS Alias** | The alias for the Source PDS. |
| **PDS Name** | The name of the PDS containing the Cobol objects. |
| Cobol Steplibs group: | |
| **PDS Alias** | The alias for the Steplib PDS. |
| **PDS Name** | The name of the PDS containing the Cobol steplib objects. |
| Cobol Maps group: | |
| **PDS Alias** | The alias for the Map PDS. |
| **PDS Name** | The name of the PDS containing the Cobol Map objects. |

| PFKEYS | DESCRIPTION |
| --- | --- |
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Cobol Application Properties. |

## Application Properties - JCL

The JCL Application Properties option is accessed by selecting '**PF10' JCL** from the Application Properties screen. It allows for the definition of Source and Procedure PDS names for JCL objects if applicable. The extract process will select the objects from the PDS in the order in which they are specified.

The following Figure 1-7 illustrates the JCL Application Properties screen.

```
                        - JCL PDS -           Application: HOSPITAL

            Alias      PDS Name
   Source   _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____

 Procedures _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____
            _____   _____


 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit        Apply
```

**Figure 1-7 JCL Application Properties screen**

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |
| JCL Source group: | |
| **PDS Alias** | The alias for the Source PDS. |
| **PDS Name** | The name of the PDS containing the JCL objects. |
| JCL Procedures group: | |
| **PDS Alias** | The alias for the Procedures PDS. |
| **PDS Name** | The name of the PDS containing the JCL Procedures. |

| PFKEYS | DESCRIPTION |
| --- | --- |
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save JCL Application Properties. |

# BUILDING A REPOSITORY OF YOUR APPLICATIONS

## Chapter Overview

The first stage in using Natural Engineer is to build a comprehensive Repository of information on your Natural applications, creating a structured view of the application code and providing application Analysis and inventory information. The following options are available from the Environment menu and are described in this chapter:

1. **Extract and Load Selection Criteria**

Select one or more objects from the Natural System File and/or Cobol source and copybook locations for extraction and override default Load settings if required.

2. **Extract Source Code**

Extracts Natural and/or Cobol source codes and creates an output file of neutral records.

3. **Load Repository**

Loads the Extract output file information into the Natural Engineer Repository.

4. **Extract & Load**

Allows you to execute both the Extract and the Load processes in one single step.

5. **Extract Missing Objects**

Extracts the objects identified as missing on the Missing Objects report.

# Extract and Load Selection Criteria

You use this option to select one or more objects from the Natural System File and/or Cobol source and copybook locations or JCL for extraction. This function is optional; it allows you to include selected objects that may have changed as a result of maintenance.

You can specify individual objects, select several objects using wildcards, and ranges of objects using the Extract and Load Selection Criteria screen illustrated below or override default Load parameter settings.

It is possible to specify objects or a range of objects to be excluded from the extract process. However if there are data areas, copycodes or DDMs that match the exclusion criteria but are used by another object then they will still be extracted as they are critical to the internal processing of the application.

The default for Extract Selection Criteria is to extract all objects from the Natural application library specified in Application Properties.

*Note: Refer to the section* *Application Properties* *in Chapter 1 for more information on Application Properties.*

# Extract and Load Selection Criteria Screen

The Extract and Load Selection Criteria screen is accessed by selecting option 'S' (Extract and Load Selection Criteria) from the Environment Menu screen.

The following Figure 2-1 illustrates the Extract and Load Selection Criteria screen.

```
                  - Extract & Load Selection Criteria - Application: HOSPITAL

   Extract Languages:


                  Natural  Y
                  Cobol   _
                  JCL     _

Load:

   Calculate Metrics _   Force Replace Y   Validate Objects _






Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Save                  Cob   JCL   Nat*  Main
```

**Figure 2-1 Main Extract and Load Selection Criteria screen**

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |
| **Extract Section:** | |
| **Extract Languages** | Select which programming languages the objects to be extracted are from. Available selections are:<br><br>**Natural**<br>**Cobol**<br>**JCL**<br><br>*Note: Extract and load of COBOL source code is not available for z/VSE or BS2000 mainframe environments.* |
| **Load Section:** | |
| **Calculate Metrics** | If checked the metrics data will be generated during the Load process.<br><br>If unchecked the metrics data will not be generated during the Load process. |
| **Force Replace** | If checked this will force the Load process to reload from the start.<br><br>If unchecked, the Load process will check the time stamps of each object, and if the same, will not load that object. |
| **Validate Objects** | If checked this will run the Validate Objects process following a successful Load. Please note that this will only work for Natural objects when invoked automatically after the Load process. |

| PFKEYS | DESCRIPTION |
|--------|-------------|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Extract and Load Selection Criteria for the application. |
| **PF9** | Invoke the COBOL Extract and Load Criteria Selection screen. |
| **PF10** | Invoke the JCL Extract and Load Criteria Selection screen.. |
| **PF11** | Invoke the Natural Extract & Load Criteria Selection screen. |
| | *Note: If an asterix (*) is appended to the CoB, JCL or Nat labels for PF9, PF10 or PF11 then selection criteria is present for that particular language.* |
| **PF12** | Returns to the Natural Engineer Main Menu. |

## COBOL Extract and Load Selection Criteria Screen

The Extract and Load Selection Criteria screen for COBOL objects is accessed by selecting '**PF9**' from the main Extract & Load Selection Criteria screen.

The following Figure 2-1-1 illustrates the COBOL Extract and Load Selection Criteria screen.

```
                 - Extract & Load Selection Criteria - Application: HOSPITAL


                         Opt     Start Object  End Object
     Cobol                _         *_____     _____







     Synchronize          _

     User Defined File  _____
     Entry Point        _____  Nbr of Levels _

 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Save  Excl  Prev  Next  Miss  Top         Main
```

**Figure 2-1-1 COBOL Extract and Load Selection Criteria screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|

**Extract Section:**

**Opt**

Line command options. Valid options are:

'**I**'    Insert a new line.

'**D**'    Delete the current line.

**Start Object**

The name of the first object to be extracted. This can be a single object name or part of a range of objects if End Object has been specified.

Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges.

**End Object**

The name of the last object to be extracted. This is only valid if a Start Object has been specified.

Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges.

**Synchronize**

When this option is selected, Natural Engineer compares each object's saved date in the Repository with the saved date of the COBOL object. If the object has been saved more recently than that in the Repository, Natural Engineer will re-extract that object into the Repository and overwrite the existing object.

Valid options are:

**Blank**    No Synchronize.

'**Y**'    Synchronize source code.

'**N**'    No Synchronize.

**User Defined File**

This allows the user to specify a dataset that contains the names of the objects to be extracted. The dataset should be in the format:

Bytes 1-8  – Natural Engineer Application Name
Bytes 9-16 – Object Name

For example to extract only XX001P01 and XX021P01 from HOSPITAL, the file would contain:

HOSPITALXX001P01
HOSPITALXX021P01

**Entry Point**

Specifying an entry point allows a sub-set of an application to be extracted. All objects that the entry point includes/calls are extracted recursively until the number of nested levels is reached.

**Nbr of Levels**

Used in conjunction with the Entry Point setting. Specifies how many levels the extract process will identify included/called objects.

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Extract and Load Selection Criteria for the application. |
| **PF6** | Invoke the Exclude Objects pop-up window. |
| | *Note: Refer to the section Exclude Objects for more information on this option.* |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF9** | Invoke the Valid Missing Objects screen. |
| | *Note: Refer to the section Valid Missing Objects for more information on this option.* |
| **PF10** | Repositions to the top of the Extract Selection Criteria list. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# JCL Extract and Load Selection Criteria Screen

The Extract and Load Selection Criteria screen for JCL objects is accessed by selecting '**PF10**' from the main Extract & Load Selection Criteria screen.

The following Figure 2-1-2 illustrates the JCL Extract and Load Selection Criteria screen.

```
              - Extract & Load Selection Criteria - Application: HOSPITAL


                        Opt     Start Object  End Object
     JCL                 _         *_____     _____











     Synchronize        _
     User Defined File _____



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Save  Excl  Prev  Next  Miss  Top         Main
```

**Figure 2-1-2 JCL Extract and Load Selection Criteria screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|

**Extract Section:**

| | |
|---|---|
| **Opt** | Line command options. Valid options are: |
| | 'I'    Insert a new line. |
| | 'D'    Delete the current line. |
| **Start Object** | The name of the first object to be extracted. This can be a single object name or part of a range of objects if End Object has been specified. |
| | Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges. |
| **End Object** | The name of the last object to be extracted. This is only valid if a Start Object has been specified. |
| | Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges. |
| **Synchronize** | When this option is selected, Natural Engineer compares each object's saved date in the Repository with the saved date of the JCL object. If the object has been saved more recently than that in the Repository, Natural Engineer will re-extract that object into the Repository and overwrite the existing object. |
| | Valid options are: |
| | **Blank**    No Synchronize. |
| | 'Y'    Synchronize source code. |
| | 'N'    No Synchronize. |
| **User Defined File** | This allows the user to specify a dataset that contains the names of the objects to be extracted. The dataset should be in the format: |
| | Bytes 1-8   – Natural Engineer Application Name |
| | Bytes 9-16 – Object Name |
| | For example to extract only XX001P01 and XX021P01 from HOSPITAL, the file would contain: |
| | HOSPITALXX001P01 |
| | HOSPITALXX021P01 |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Extract and Load Selection Criteria for the application. |
| **PF6** | Invoke the Exclude Objects pop-up window. |
| | *Note: Refer to the section <u>Exclude Objects</u> for more information on this option.* |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF9** | Invoke the Valid Missing Objects screen. |
| | *Note: Refer to the section <u>Valid Missing Objects</u> for more information on this option.* |
| **PF10** | Repositions to the top of the Extract Selection Criteria list. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

## Natural Extract and Load Selection Criteria Screen

The Extract and Load Selection Criteria screen for Natural objects is accessed by selecting '**PF11**' from the main Extract & Load Selection Criteria screen.

The following Figure 2-1-3 illustrates the Natural Extract and Load Selection Criteria screen.

```
             - Extract & Load Selection Criteria - Application: HOSPITAL


                        Opt     Start Object  End Object
    Natural              _         *_____     _____






    Object Types      All Objects
    Synchronize       _   All Objects for Compilation Y
    All Called Objects Y  Include External Called Objects  _
    User Defined File _____
    Entry Point       XX021P01_____  Nbr of Levels 3

 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Types Exit        Save  Excl  Prev  Next  Miss  Top        Main
```

**Figure 2-1-3 Natural Extract and Load Selection Criteria screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|

**Extract Section:**

**Opt**

Line command options. Valid options are:

'**I**'     Insert a new line.

'**D**'     Delete the current line.

**Start Object**

The name of the first object to be extracted. This can be a single object name or part of a range of objects if End Object has been specified.

Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges.

**End Object**

The name of the last object to be extracted. This is only valid if a Start Object has been specified.

Note: Refer to the section Specifying Object Names below for more information on how to specify object names and ranges.

**Synchronize**

When this option is selected, Natural Engineer compares each object's saved date in the Repository with the saved date of the JCL object. If the object has been saved more recently than that in the Repository, Natural Engineer will re-extract that object into the Repository and overwrite the existing object.

Valid options are:

**Blank**     No Synchronize.

'**Y**'     Synchronize source code.

'**N**'     No Synchronize.

**All Called Objects**

When this option is selected, Natural Engineer will extract all objects specified by the criteria. In addition it will extract any other objects, including those that do not match the criteria, that are called by the objects to be extracted.

*NB: This is valid for Natural Objects only.*

**Object Types**

You can specify the object type code to limit the objects selected to one or all object types. Selection is made by using '**PF2**' (Types).

Available selections are:

'**\***'     All Objects

'**4**'     Classes

'**C**'     Copycodes

'**3**'     Dialogs

'**G**'     Global Data Areas

'**H**'     Helproutines

'**L**'     Local Data Areas

| SCREEN ITEMS | DESCRIPTION |
|---|---|

|  | 'M' | Maps |
|  | 'A' | Parameter Data Areas |
|  | 'P' | Programs |
|  | 'S' | Subroutines |
|  | 'N' | Subprograms |

**Entry Point**

Specifying an entry point allows a sub-set of a Natural application to be extracted. All objects that the entry point includes/calls are extracted recursively until the number of nested levels is reached.

*NB: If an entry point is specified then the language can only be Natural and all Object Types must be selected. No other extract criteria are valid except Synchronize. When Synchronize is set on, Force Replace must be set off to ensure only changed objects within the entry point path are reloaded.*

**Nbr of Levels**

Used in conjunction with the entry point setting. Specifies how many levels the extract process will identify included/called objects.

**All Objects for Compilation**

When this option is selected, Natural Engineer will extract all objects specified by the criteria. In addition it will extract any other objects, including those that do not match the criteria, that are required by the objects to compile in Natural.

NB: This is valid for Natural Objects only.

**Include Called External Objects**

This is a sub-option of Extract All Called Objects. When this option is selected, Natural Engineer will additionally extract all external objects e.g., COBOL objects, that are called by the objects to be extracted.

If any restrictions are to be applied to the COBOL objects identified to be extracted then these need to be set on the COBOL screen. The only applicable settings on the COBOL screen are Valid Missing Objects, Exclusions and User-defined Exclusion file.

If this option is selected then only a Natural Language extract may be performed.

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |
| **User Defined File** | This allows the user to specify a dataset that contains the names of the objects to be extracted. The dataset should be in the format: |
| | Bytes 1-8  – Natural Engineer Application Name |
| | Bytes 9-16 – Object Name |
| | |
| | For example to extract only XX001P01 and XX021P01 from HOSPITAL, the file would contain: |
| | HOSPITALXX001P01 |
| | HOSPITALXX021P01 |

| PFKEYS | DESCRIPTION |
| --- | --- |
| **PF1** | Activates the help function. |
| **PF2** | Invoke the Object Type Selection pop-up window. |
| | Available selections are: |
| | **Object Types** |
| | '**4**'    Classes |
| | '**C**'    Copycode |
| | '**3**'    Dialogs |
| | '**G**'    Global Data Areas |
| | '**H**'    Helproutines |
| | '**L**'    Local Data Areas |
| | '**M**'    Maps |
| | '**A**'    Parameter Data Areas |
| | '**P**'    Programs |
| | '**N**'    Subprograms |
| | '**S**'    Subroutines |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Extract and Load Selection Criteria for the application. |
| **PF6** | Invoke the Exclude Objects pop-up window. |
| | *Note: Refer to the section Exclude Objects for more information on this option.* |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |

| PFKEYS | DESCRIPTION |
|--------|-------------|
| **PF9** | Invoke the Valid Missing Objects screen. |
|  | *Note: Refer to the section Valid Missing Objects for more information on this option.* |
| **PF10** | Repositions to the top of the Extract Selection Criteria list. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# Specifying Object Names

The object names specified in the Start Object and End Object columns on the Extract Selection Criteria screen use the following standard conventions:

**Single Object Name**

Enter full object names in Start Object list.

**Multiple Object Group**

Enter partial object name in Start Object list, with an asterisk (*). This will allow you to Extract all objects starting with the values before the asterisk.

**Multiple Object Range**

Enter a Start Object name and an End Object name in the same row. This will Extract all objects in alphanumeric order starting from the Start Object and ending with the End Object.

**Combination Selection Types**

You can enter multiple rows with different criteria, including multiple single objects, groups and ranges.

**Examples:**

| Start Object | End Object | Result |
|---|---|---|
| * | | Extracts all objects. |
| XX021P01 | | Extracts single object 'XX021P01'. |
| XX001* | | Extracts all objects with names prefixed with 'XX001'. |
| XX001L01 | XX001P01 | Extracts all objects in the alphabetic range starting from 'XX001L01' and ending at 'XX001P01'. |
| XX001.01 | | Processes all objects matching the mask where a period (.) is 'any digit'. So, in this case, XX001L01, XX001M01 and XX00P01 would be extracted. |
| | | *NB: Valid on PC and Mainframe platforms only.* |

# Valid Missing Objects

It is possible to enter a list of object names with wildcards, to a maximum of 10 that will not be marked as missing during the Extract process.

The Valid Missing Objects option is accessed by selecting '**PF9** (Miss) from the language Extract and Load Selection Criteria screens.

The following Figure 2-2 illustrates the Valid Missing Objects screen.

```
                       - Valid Missing Objects -   Application: HOSPITAL


                                   Object Name
                          1     USR*____
                          2     _____
                          3     _____
                          4     _____
                          5     _____
                          6     _____
                          7     _____
                          8     _____
                          9     _____
                         10     _____





Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Save                                      Main
```

**Figure 2-2 Valid Missing Objects screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Object Name** | The object name to be marked as a valid missing object. This can be an exact name or a part name with wildcard. For Example: |

| | |
|---|---|
| **XX003P01** | Object XX003P01 would be marked as a valid missing object. |
| **XX001**\* | Any objects prefixed with XX001 would be marked as valid missing objects. |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Valid Missing Objects list for the application. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# Exclude Objects

It is possible to enter a list of object names with wildcards to be excluded from the Extract process.

The Exclude Objects option is accessed by selecting '**PF6** (Excl) from the language Extract and Load Selection Criteria screens.

The following Figure 2-2-1 illustrates the Exclude Objects pop-up window.

```
        +------------------------------------------------------------+
        ¦               Extract Exclude Objects                      ¦
        ¦                                                            ¦
        ¦      Opt      Start Object  End Object                     ¦
Extract ¦       _         CST*____     _____                      ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
        ¦                                                            ¦
  Objec ¦            User Defined File                               ¦
  Objec ¦            _____       ¦
  Synch ¦                                                            ¦
  Entry ¦         PF3 - Exit  PF5 - Apply  PF7 - Prev  PF8 – Next    ¦
  User  ¦                                                            ¦
Load:   +------------------------------------------------------------+
  Calculate Metrics Y   Force Replace N   Validate Objects Y
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help  Types Exit        Save  Excl  Prev  Next  Miss  Top         Main
```

**Figure 2-2-1 Exclude Objects pop-up window**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Opt** | Line command options. Valid options are: |
| | '**I**'   Insert a new line. |
| | '**D**'   Delete the current line. |
| **Start Object** | The name of the first object to be excluded from the extract. This can be a single object name or part of a range of objects if End Object has been specified. |
| | *Note: Refer to the section <u>Specifying Object Names</u> below for more information on how to specify object names and ranges.* |
| **End Object** | The name of the last object to be excluded from the extract. This is only valid if a Start Object has been specified. |
| | *Note: Refer to the section <u>Specifying Object Names</u> below for more information on how to specify object names and ranges.* |
| **User Defined Exclusion File** | This allows the user to specify a file containing the names of the objects to be excluded from the extract. The file should be in the format: |
| | Bytes 1-8   – Natural Engineer Application Name |
| | Bytes 9-16 – Natural Object Name |
| | |
| | For example to exclude only XX002P01 and XX022P01 from HOSPITAL, the file would contain: |
| | HOSPITALXX002P01 |
| | HOSPITALXX022P01 |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Save Exclude Objects list for the application. |
| **PF7** | Displays the previous page. |
| **PF8** | Displays the next page. |

# Extract Source Code

This is the first real processing step in creating the Natural Engineer Repository and extracts the Natural source code for the defined application.

Natural Engineer reads the application code and creates a "neutral" view of the code, that is, irrespective of the Natural version or the mode used (structured or reporting).

The Extract process writes out files that contain the neutral application records, as well as an error file. If you are executing multiple Extract processes it is advisable to make a copy of the current error file so that is always available

The Extract function also performs a basic quality check, which identifies any invalid statements or syntax within the objects. If any errors are found, they are logged and displayed on completion of the Extract process.

If a Natural Engineer Extract does not end cleanly because of logic errors or invalid response codes from Natural or Adabas it will issue a return code of 255. If the extract identifies missing objects or a non-critical error e.g., incorrect mode only then a return code of 254 is returned.

## Related Processes

The Extract process allows you to correct errors before building the Repository. It also allows you to include identified missing objects, such as DDMs, Data Areas and Copycode before further processing. Missing objects can be seen in the Missing Natural Objects report, which can be accessed by selecting '**R**' (Application Reports) from the Environment Menu screen.

*Note: For more information on the Missing Natural Objects Report refer to Chapter 3 in the Natural Engineer Reporting manual.*

Objects that are no longer required in the Repository are best removed from the source library. If the Repository has been loaded, these can also be selectively deleted from the Repository using the Delete Object option under the Application menu.

*Note: See the section Delete Object in Chapter 1 of this manual for more information.*

This option is invoked by selecting option '**E**' (Extract Source Code) from the Environment Menu screen. This will open the NATRJE Job Submission screen.

**Natural Engineer Application Management**

The following Figure 2-3 illustrates the NATRJE submission screen for the Extract Source Code option.

```
                     - Job Submission -        Application: HOSPITAL

          Job Selection details
          --------------------
              Job Selected  :  (NATEXT) EXTRACT SOURCE CODE

          Job Card details
          ----------------
                Job Name  :  XGSLXX__
                Job Class :  _

          Job Control Record details
          ------------------------
          Control Status  :
          Last Job Submitted
            Job Name :
                Opid :
                Step :
          Return Code :



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub   Ref               Rel               Main
```

**Figure 2-3 NATRJE Job Submission screen**

*Note 1: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Load Repository

The next step after Extracting the source code is to Load Natural Engineer's Repository from the output file of the Extract process. All information, cross-references, and relationships are built into the Repository for interrogation, reporting, diagramming and further processing.

## Related Processes

After loading of the Repository, check the Missing Objects Report option and selectively Extract and Load those objects after adding them to the application library. Alternatively you can execute the Extract Missing Object option after adding them to the appropriate library.

The Missing Natural Objects report is accessed via the Quality Logs option. You may add new or changed objects to the loaded Repository using the Load Repository option.

This option is invoked by selecting option 'L' (Load Repository) from the Environment Menu screen. This will open the NATRJE Job Submission screen.

The following Figure 2-4 illustrates the NATRJE submission screen for the Load Repository option.

```
                      - Job Submission -        Application: HOSPITAL

            Job Selection details
            --------------------
                 Job Selected  :  (REPUPD) LOAD REPOSITORY

            Job Card details
            ----------------
                   Job Name  :  XGSLXX__
                   Job Class :  _

             Job Control Record details
             -------------------------
            Control Status  :
            Last Job Submitted
               Job Name :
                   Opid :
                   Step :
            Return Code :


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub   Ref               Rel               Main
```

**Figure 2-4 NATRJE Job Submission screen**

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Extract and Load

The Extract & Load option allows you to perform both the Extract and Load operations in a single step.

Any missing objects or objects with errors identified during the Extract process will be reported, and can be added selectively to the Repository after completion of the Load process.

This option is invoked by selecting option '**X**' (Extract & Load) from the Environment Menu screen. This will open the NATRJE Job Submission screen.

The following Figure 2-5 illustrates the NATRJE submission screen for the Extract & Load option.

```
                      - Job Submission -        Application: HOSPITAL

            Job Selection details
            --------------------
                Job Selected  :  (EXTLOD) EXTRACT & LOAD

            Job Card details
            ----------------
                    Job Name  :  XGSLXX__
                    Job Class :  _

            Job Control Record details
            -------------------------
            Control Status  :
            Last Job Submitted
              Job Name :
                  Opid :
                  Step :
            Return Code :



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub   Ref                     Rel               Main
```

**Figure 2-5 NATRJE Job Submission screen**

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Bulk Extract and Load

There are two stand-alone batch jobs available that may be used to provide automatic extract and load of one or more applications.

BLKEXX        Bulk Extract & Load Parameter Generator
BLKEXL        Bulk Extract & Load Execution.

BLKEXX is designed to run against an existing repository and will read all current extract and load settings and produce an XML file that may be tailored by the user to their own requirements. It is optional. If the user wishes they may create their own XML file to be read by the Bulk Extract & Load Execution (BLKEXL) job.

BLKEXX runs a Natural program BLKEXX-P which accepts three parameters.

| Parameter | Format | Options | Description |
|---|---|---|---|
| #IN-OPT | A03 | TMP | Will create an 'empty' XML file to be customized as required. |
| | | EXT | Will process the current applications in the Natural Engineer Repository and add specific extract data e.g. include ranges, entry points, valid missing objects into the XML file |
| #IN-APP-RANGE | A17 | * | Will process all applications |
| | | AAAAAAAA | Where AAAAAAAA is a single application name. |
| | | AZZZZZZZ:BZZZZZZZ | A range of application names to be processed. |
| #IN-OVERRIDES | A01 | Y | The individual application settings will be added for each application. |
| | | Not set | If not set, the parameters are not set at application level meaning that the general parameter setting will always apply to each application. |

BLKEXL reads the XML file and submits an Extract & Load job for each application within the application ranges specified.

There is a text member BLKEXX-T located in the SYSNEE Natural library that contains sample XML settings for the BLKEXL job.

The jobclass setting for the BLKEXL job may be specified in the ###CINI initialization file as follows;

```
[EXTRACT]
JOBCLASS=x
```

# Extract Missing Objects

The Extract Missing Objects option extracts the missing called objects as identified in the Missing Natural Objects report. If an object is a data area or copycode, it will also extract the calling object (unless it has been extracted in the same execution).

*Note:*

- *A maximum of 1000 missing objects will be extracted using this process.*

- *Missing DDMs will not be extracted using this process.*

The process to follow for extracting the most complete application is:

1. Extract and Load an application into Natural Engineer.

2. Check the Missing Natural Objects report to identify any missing objects.

3. Copy those missing objects to the Natural library or Steplib library defined to Natural Engineer.

4. Run the Extract Missing objects option.

If an object is displayed on the Missing Natural Objects report but not copied as part of step 3, then the Extract process will identify this as an error with the message:

- NO SUCH OBJECT EXISTS IN DIRECTORY

If a DDM is identified as missing then the DDM should be located and copied to the application library, a defined steplib or the SYSTEM library. All objects that reference the missing DDM need to be re-extracted. Either identify the missing object by running the DDMs referenced by Object report, or selectively extract and load those objects, or re-execute the Extract and Load processes for all objects in the application.

This option is invoked by selecting option '**O**' (Extract Missing Objects) from the Environment Menu screen. This will open the NATRJE Job Submission screen.

The following Figure 2-6 illustrates the NATRJE submission screen for the Extract Missing Objects option.

```
                    - Job Submission -        Application: HOSPITAL

          Job Selection details
          --------------------
              Job Selected  :  (EXTMIS) EXTRACT MISSING OBJECTS

          Job Card details
          ----------------
                  Job Name  : XGSLXX__
                  Job Class :  _

           Job Control Record details
          --------------------------
          Control Status  :
          Last Job Submitted
            Job Name :
                Opid :
                Step :
          Return Code :



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub  Ref              Rel             Main
```

**Figure 2-6 NATRJE Job Submission screen**

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

It is possible to use the stand-alone Bulk Extract & Load jobs (BLKEXX/BLKEXL) to maintain the repository following an initial load if required. *For more information refer to the Natural Engineer Installation manual.*

# Load Audit Trail

The Load Audit Trail option identifies any objects that when loaded have had a different timestamp to the corresponding object within the repository. The option is activated by the Activate Load Audit Trail setting in the Global Properties

This option is invoked by selecting option 'T' (Load Audit Trail) from the Environment Menu screen.

This will open the Load Audit Trail screen were it is possible to enter the date range required for the report and also to perform housekeeping n the Load Audit data.

The following Figure 2-7 illustrates the Load Audit Trail Report screen.

```
 MFLOGM01              - Load Audit Trail Report -   Application: HOSPITAL


         Date Range

             Start:  __ __ ____  (dd mm yyyy)

               End:  __ __ ____  (dd mm yyyy)








Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub  HKeep                              Main
```

**Figure 2-7 Load Audit Trail Report screen**

| PFKEYS | DESCRIPTION |
| --- | --- |
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Invoke NATRJE Job Submission screen. |
| **PF6** | Invoke the Load Audit Trail Housekeeping pop-up screen. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

The Load Audit Trail Report can be viewed by using '**PF5**' (Sub) to submit the batch job via the NATRJE Job Submission screen.

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Load Audit Trail Housekeeping

The Load Audit Trail Housekeeping option allows the user to delete any Load Audit Trail data from the repository.

The Load Audit Trail Housekeeping screen may be invoked by using '**PF6**' (HKeep) from the Load Audit Trail Report screen.

The following Figure 2-8 illustrates the Load Audit Trail Housekeeping pop-up screen.

```
+-------------Load Audit Trail Housekeeping--------------+
!                                                       ! tion: HOSPITAL
!                                                       !
!                                                       !
!    Delete Load Audit                                  !
!      Trail records older:   11 2_ 2014 (dd mm yyyy)   !
!                                                       !
!                                                       !
!                                                       !
!    PF3 - Exit  PF5 - Submit                           !
!                                                       !
!                                                       !
!                                                       !
+-------------------------------------------------------+




Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub  HKeep                                Main
```

**Figure 2-8 Load Audit Trail Housekeeping pop-up screen**

| PFKEYS | DESCRIPTION |
|--------|-------------|
| **PF1** | Activates the help function. |
| PF3 | Exit from the current function and return to previous screen. |
| PF5 | Invoke NATRJE Job Submission screen. |

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# APPLICATION MANAGEMENT

## Chapter Overview

This chapter describes the Application Management options available from the Environment menu.

Application Management provides the facility to manage supplementary information on the objects within applications held on the Repository.

The Application Management option is accessed by selecting option 'A' from the Environment Menu screen. This will display the Application Management sub menu screen.

The Application Management sub menu screen provides facilities for the user to add, remove and update additional information for individual objects.

The topics covered in this chapter:

1.  Soft Links
2.  Object Documentation
3.  JCL Analysis

# Soft Links

The Soft Links option allows you to manually update the Repository with information regarding the linking between objects. A Soft Link is one where a link between two objects has been defined using an alphanumeric variable rather than a literal constant.

For example;
1) A link to a subprogram using a literal constant: -
    **0090 CALLNAT 'SUBPROG1' #PARAMETER-GROUP**

2) A link to a subprogram using an alphanumeric variable: -
    **0250 MOVE 'SUBPROG1' TO #CALL-NAME**
    **0260 CALLNAT #CALL-NAME #PARAMETER-GROUP**
  This is what Natural Engineer recognizes as a Soft Link.

Natural Engineer will provide a list of objects within an application that contain Soft Links statements. Only objects containing Soft Links will be available for selection from the Soft Link Maintenance screen. That is to say, any objects that use literal constants only will not be shown in the object list on this screen.

A single object may contain one or more Soft Link statements. Each statement can be selected to specify the object name reference for the Soft Link. Up to a maximum of 1008 object names may be specified per statement.

Once all the Soft Links have been specified, they will provide the cross-reference information into the inter-object tracing function within the Analysis process.

A Soft Links report is available to view instantly all the details of which Soft Links have been specified, for each statement line within each object, within the application.

*Note: For more information on the Soft Links report refer to Chapter 3 in the Natural Engineer Reporting manual.*

# Soft Link Objects Screen

The Soft Links option is accessed by selecting option 'S' (Soft Links) from the Application Management sub menu screen. This will display the Soft Link Objects screen with a list of the available objects containing soft links for the current application.

The following Figure 3-1 illustrates the Soft Link Objects screen showing a list of objects containing soft links.

```
                    - Soft Link Objects -     Application: SOFTLINK

            Select   Object
               _        SOFTLN1S
               _        SOFTLP1S
               _        SOFTLP2S
               _        SOFTLP3S







            Reposition: _____
          Object Lang. * All
          Object Types CHMNPS
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help  Types Exit       Rep         Prev  Next                      Main
```

**Figure 3-1 The Soft Link Objects screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Select** | This is the selection column where individual objects can be selected. Valid selections are: |

'**S**'    Select object.

'**D**'    Delete All Soft Links for an object.

| | |
|---|---|
| **Object** | List of objects containing Soft Links within an application. Objects that have had Soft Links specified and saved to the Repository, will have an asterisk (*) to the left of the object name. |
| **Reposition** | Reposition the list of objects starting from the new value entered. The reposition value can be input using either a complete name or part name using an '*' (asterisk) wildcard. For example: |

| Value | Result |
|---|---|
| * | Will reposition at the start of the Object list. |
| | For the HOSPITAL system, this would start the object list from object XXCONPDA. |
| **XXE*** | Will reposition at the first object name that matches the mask XXE or is greater than the mask input. |
| | For the HOSPITAL system, this would start the object list from object XXEXIT. |
| **XX000G01** | Will reposition at the first object name that matches the mask exactly or is greater than the object name input. |
| | For the HOSPITAL system, this would start the object list from object XX001L01 as object XX000G01 does not exist. |

| | |
|---|---|
| **Object Lang.** | Allows you to select the programming language of the objects to be listed. Selection is made by using '**PF2**' (Types). Available selections are: |

'*'    All

'**C**'    Cobol

'**N**'    Natural

| | |
|---|---|
| **Object Types** | Allows you to select the types of object to be listed. Selection is made by using '**PF2**' (Types). Available selections are: |

'**C**'    Copycodes

'**M**'    Maps

'**P**'    Programs

'**N**'    Subprograms

'**S**'    Subroutines

| PFKEYS | DESCRIPTION |
|---|---|
| PF1 | Activates the help function. |
| PF2 | Invoke the Object Type Selection pop-up window. |
| | Available selections are: |
| | **Object Language** |
| | 'C'   COBOL |
| | 'N'   Natural |
| | **Object Types** |
| | 'C'   Copycode |
| | 'H'   Helproutines |
| | 'M'   Maps |
| | 'P'   Programs |
| | 'N'   Subprograms |
| | 'S'   Subroutines |
| PF3 | Exit from the current function and return to previous screen. |
| PF5 | Invoke NATRJE Job Submission screen. |
| PF7 | Displays previous page. |
| PF8 | Displays next page. |
| PF12 | Returns to the Natural Engineer Main Menu. |

The Soft Links Report can be viewed by using '**PF5**' (Sub) to submit the batch job via the NATRJE Job Submission screen.

The following Figure 3-2 illustrates the NATRJE submission screen for Soft Links report.

```
                        - Job Submission -       Application: SOFTLINK

           Job Selection details
           --------------------
               Job Selected  : (REPREP) APPLICATION REPORTS

           Job Card details
           ----------------
                 Job Name  :  XGSLXX__
                 Job Class :  _

           Job Control Record details
           ------------------------
           Control Status  :
           Last Job Submitted
             Job Name :
                 Opid :
                 Step :
           Return Code :



Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Sub   Ref                Rel                Main
```

**Figure 3-2 NATRJE Job Submission screen**

*Note: For more information on the NATRJE Job Submission screen refer to the Natural Engineer Batch Processing (Unix) manual.*

# Soft Link Statements Screen

The Soft Link Statements screen is accessed by selecting an object from the Soft Link Objects screen. This will list all the Soft Link statements within the selected object.

The following Figure 3-3 illustrates the Soft Link Statements screen showing a list of statements containing soft links.

```
                         - Soft Link Statements -      Application: SOFTLINK
  Object: SOFTLP1S
  Select   Statement
           0120 FETCH RETU #PROGRAM-NAME
      _    0190 FETCH      #PROGRAM-NAME
      _    0300 CALLNAT    #PROGRAM-NAME
      _




















Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help       Exit                    Prev  Next                      Main
```

**Figure 3-3 The Soft Link Statements screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Select** | This is the selection column where individual statements can be selected. Valid selections are:<br><br>'**S**'    Select statement. |
| **Statement** | List of statements within the selected object containing Soft Links. Each entry shows:<br><br>▪ The statement line number.<br>▪ The type of call. For example CALLNAT.<br>▪ The alphanumeric variable used to make the call. For example #PROGRAM-NAME.<br><br>Statements that have had Soft Links specified and saved to the Repository, will have an asterisk (*) to the left of the statement. |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# Maintain Soft Links Screen

To specify the Soft Links for a statement line within an object simply select the statement line from the Soft Link Statement screen and the Maintain Soft Links screen will be presented. On this screen it is possible to specify up to 1008 individual Soft Link names per statement line.

The following Figure 3-4 illustrates the Maintain Soft Links screen.

```
                     - Maintain Soft Links -    Application: SOFTLINK

   Object...: SOFTLP1S Statement No.: 0120
   Call Name: #PROGRAM-NAME
   Number of links: 0000                           View 0001 to 0048
   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____  _____  _____  _____  _____

   _____  _____
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help           Exit  Impor Save        Prev  Next  Dele  Top   Find  Main
```

**Figure 3-4 Maintain Soft Links screen**

| SCREEN ITEMS | DESCRIPTION |
| --- | --- |
| **Object** | The name of object currently selected. |
| **Statement No.** | The statement line number. |
| **Call Name** | The name of the alphanumeric variable used to make the call. For Example: #PROGRAM-NAME. |
| **Number of links** | Shows the number of Soft Link names specified for the current statement line. |
| **View** | Shows the range of Soft Link names being displayed. For Example: View: 1 to 48 indicates that you are looking at Soft Links 1 to 48. |
| **Soft Link names** | Soft Link Names can be specified as required. Each page view caters for up to 48 entries, with a maximum of 1008 entries per statement allowed. |

| PFKEYS | DESCRIPTION |
| --- | --- |
| **PF1** | Activates the help function. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF4** | Will search the currently selected object for literal string values that could potentially be used as Soft Links. These values will then be available for selection from the Import Soft Links screen.<br><br>*Note: For more information refer to the section Import Soft Links Pop-up Window* |
| **PF5** | Saves the Soft Links that have been specified. A sort will be performed, sorting the Soft Link names into ascending alpha sequence. Duplicate entries will be removed. |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF9** | Deletes all the Soft Links for the current statement line number. |
| **PF10** | Scrolls the Soft Links list to start from the first entry. |
| **PF11** | Allows you to search for a specific Soft Link name for the currently selected statement line number. This option will search for exact names only. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# Import Soft Links Pop-up Window

To assist with specifying the Soft Links for a statement line within an object, by using '**PF4**' (Impor) from the Maintain Soft Links screen. This will search for all the potential Soft Link names within the currently selected object that apply to the alphanumeric variable being used. A list of the potential Soft Link names is then displayed on the Import Soft Links screen. For example:

```
0100 IF #OPTION = 1
0110   MOVE 'PGM1' TO #CALL-NAME
0120 ELSE
0130   MOVE 'PGM2' TO #CALL-NAME
0140 END-IF
0150 FETCH #CALL-NAME
```

The Soft Link **#CALL-NAME** at statement line number 0110 (or 0130) would display the Soft Link names **PGM1** and **PGM2** on the Import Soft Links screen.

The following Figure 3-5 illustrates the Import Soft Links pop-up window.

```
                        - Maintain Soft Links -   Application: SOFTLINK

    Object...: SOFTLP1S Statement No.: 0120
    Call Name: #PROGRAM-NAME
    Number |                  Import Soft Links                   | to 0048
    _____|                                                      |
           |    SOFTLP2S    SOFTLP3S    SOFTLN1S    _____  _____
    _____|    _____    _____    _____    _____  _____
           |    _____    _____    _____    _____  _____
    _____|    _____    _____    _____    _____  _____
           |    _____    _____    _____    _____  _____
    _____|    _____    _____    _____    _____  _____
           |    _____    _____    _____    _____  _____
    _____|    _____    _____    _____    _____  _____
           |    _____    _____    _____    _____  _____
    _____|    _____    _____    _____    _____  _____
           |                                                      |
    _____|    PF3 Exit    PF5 Accept Soft Links  PF7 Prev  PF8 Next
           |_____|
    _____
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help         Exit  Impor Save        Prev  Next  Dele  Top   Find  Main
```

**Figure 3-5 Import Soft Links pop-up window**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Soft Link names** | Displays any potential Soft Link names found for the currently selected statement line. Up to a maximum of 50 names will be displayed. Any duplicates will be suppressed. The names can be further refined by selecting any of the displayed names and removing them. |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Imports the Soft Link names that have been specified into the Maintain Soft Links screen. |
| **PF7** | Scrolls the Soft Link names forward one page. |
| **PF8** | Scrolls the Soft Link names backwards one page. |

# Object Documentation

The Object Documentation option allows users to specify and save information on each object within an Application. This provides useful system documentation within Natural Engineer, complementing the source code information stored on the Repository. The information that can be stored for each object falls into two main categories:

1. **Object Title**

   An object title can be specified. The default is the object name and in the case of CONSTRUCT or PREDICT generated objects, an indication of the code generator. The input is in free format style allowing a maximum of 70 characters to be input.

2. **Comments**

   These comments can be specified as required to provide detailed information on the object, such as: the function or functions performed, any database or flat file access, runtime considerations etc. The input is in free format style allowing a maximum of 250 lines of 70 characters per line. It is possible to import the 'real' object comments found at the top of an object (i.e., before the first Natural statement).

The Object Documentation for each object within an Application is stored on the Repository.

Object Documentation can be removed from the complete Application, a range of objects or a single object.

# Object Documentation Objects Screen

The Object Documentation option is accessed by selecting option 'U' (Object Documentation) from the Application Management sub menu screen. This will display the Object Documentation Objects screen with a list of the available objects for the current application.

The following Figure 3-6 illustrates the Object Documentation Objects screen.

```
                - Object Documentation Objects -  Application: HOSPITAL

            Sel     Objects
             _      XXCONPDA
             _      XXCONUPD
             _      XXEXIT
             _      XXGETID
             _      XXMTHVAL
             _      XXTIDYUP
             _      XXVALCC
             _      XX000G00
             _      XX001L01
             _    * XX001M01
             _      XX001P01
             _      XX002L01
             _      XX002M01
             _      XX002P01
             _      XX021L01
 Reposition -> _____ Object Lang. * All
                                                Object Types 4C37GHLMAPNSJ
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
     Help  Types Exit             DelA  Prev  Next             ImpM  Main
```

**Figure 3-6 The Object Documentation Objects screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Select** | This is the selection column where individual objects can be selected. Valid selections are:<br><br>'**S**'     Select object.<br>'**D**'     Delete comments for an object. |
| **Object** | Name of the objects in the current application which are available for selection. Objects that have had comments saved to the Repository, will have an asterisk (*) before the name. |
| **Reposition** | Reposition the list of objects starting from the new value entered. The reposition value can be input using either a complete name or part name using an '*' (asterisk) wildcard. For example: |

| Value | Result |
|---|---|
| * | Will reposition at the start of the Object list.<br><br>For the HOSPITAL system, this would start the object list from object XXCONPDA. |
| **XXE\*** | Will reposition at the first object name that matches the mask XXE or is greater than the mask input.<br><br>For the HOSPITAL system, this would start the object list from object XXEXIT. |
| **XX000G01** | Will reposition at the first object name that matches the mask exactly or is greater than the object name input.<br><br>For the HOSPITAL system, this would start the object list from object XX001L01 as object XX000G01 does not exist. |

| | |
|---|---|
| **Object Lang.** | Allows you to select the programming language of the objects to be listed. Selection is made by using '**PF2**' (Types). Available selections are:<br><br>'**\***'     All<br>'**C**'     Cobol<br>'**N**'     Natural |

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Object Types** | Allows you to select the types of object to be listed. Selection is made by using '**PF2**' (Types). Available selections are: |

| | |
|---|---|
| '**4**' | Classes |
| '**C**' | Copycode |
| '**3**' | Dialogs |
| '**G**' | Global Data Areas |
| '**H**' | Helproutines |
| '**L**' | Local Data Areas |
| '**M**' | Maps |
| '**A**' | Parameter Data Areas |
| '**P**' | Programs |
| '**N**' | Subprograms |
| '**S**' | Subroutines |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |
| **PF2** | Invoke the Object Type Selection pop-up window. |
| | Available selections are: |

**Object Language**

| | |
|---|---|
| '**C**' | COBOL |
| '**N**' | Natural |

**Object Types**

| | |
|---|---|
| '**4**' | Classes |
| '**C**' | Copycode |
| '**3**' | Dialogs |
| '**G**' | Global Data Areas |
| '**H**' | Helproutines |
| '**L**' | Local Data Areas |
| '**M**' | Maps |
| '**A**' | Parameter Data Areas |
| '**P**' | Programs |
| '**N**' | Subprograms |
| '**S**' | Subroutines |

| PFKEYS | DESCRIPTION |
|--------|-------------|
| **PF3** | Exit from the current function and return to previous screen. |
| **PF6** | Delete all Object Documentation comments for all the objects within an application. |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF11** | Provides the facility to import the object comments from the object source code. The object comments imported are any comments found before the first Natural statement within an object. This option will perform the import for all the objects within an application. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

# Object Documentation Comments Screen

The Object Documentation Comments screen is accessed by selecting an object from the Object Documentation Objects screen.

The following Figure 3-7 illustrates the Object Documentation Comments screen.

```
              - Object Documentation Comments - Application: HOSPITAL
      Title
      XX001P01_____
      Comments
001   ****************************************************************
002   Author        : A. Coder_____
003   Date Created  : 01/02/2001_____
004   Function      : Main Menu Program for the Hospital system._____
005   ****************************************************************
006   _____
007   _____
008   _____
009   _____
010   _____
011   _____
012   _____
013   _____
014   _____
015   _____

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit        Save        Prev Next            ImpS  Main
```

**Figure 3-7 Object Documentation Comments screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| Object Title | Provides the input of an object title. The default is the object name and in the case of CONSTRUCT or PREDICT generated objects, an indication of the code generator. The input is in free format style allowing a maximum of 70 characters to be input. Some examples:<br><br>**XX001P01**<br><br>**CON001P1  (Generated by Construct)**<br><br>**PREDP01 (Generated by Predict)**<br><br>**ABC00G01 – Global Data Area** |
| Comments | Provides the ability to input any required object comments to document the object. The input is in free format style allowing a maximum of 250 lines, each of which can have a maximum of 70 characters to be input. For example:<br><br>**This program calculates the Tax value required for each sale based on a table of tax rates. The base rate is 12.25%.** |

| PFKEYS | DESCRIPTION |
|---|---|
| PF1 | Activates the help function. |
| PF3 | Exit from the current function and return to previous screen. |
| PF5 | Saves the specified Object Documentation comments. |
| PF7 | Displays previous page. |
| PF8 | Displays next page. |
| PF11 | Provides the facility to import the object comments from the object source code. The object comments imported are any comments found before the first Natural statement within an object. This option will perform the import for the current selected object only. |
| PF12 | Returns to the Natural Engineer Main Menu. |

# JCL Analysis

The JCL Analysis option provides the facility to generate cross-reference data for work file and DDM record layouts, for any JCL objects executing Natural programs.

The JCL Analysis process will analyze all the work file and DDM accesses within the Natural objects, starting from the Natural program referenced in the JCL.

## JCL Analysis Screen

The JCL Analysis option is accessed by selecting option 'J' (JCL Analysis) from the Application Management sub menu screen. This will display the JCL Analysis criteria screen where the JCL objects to be analyzed may be specified.

The following Figure 3-7 illustrates the JCL Analysis criteria screen.

```
                        - JCL Analysis -           Application: COBJCLNT

       Select   Object                        Object Type
         _      INCJCLDD                       JCL Copycode
         _      INCJCL10                       JCL Copycode
         _      INCJCL44                       JCL Copycode
         _      INCNATDD                       JCL Copycode
         _      JCLCOB10                       JCL Member
         _      JCLDSN44                       JCL Member
         _      JCLINCDD                       JCL Member
         _      JCLINC10                       JCL Member
         _      JCLINC44                       JCL Member
         _      JCLMISPR                       JCL Member
         _      JCLNATEX                       JCL Member
         _      JCLNAT01                       JCL Member
         _      JCLNAT02                       JCL Member
         _      JCLPRCEX                       JCL Member
     Reposition -> _____
     Limit (0=unlimited) 3


 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help  Unprc Exit        Sub   Exe   Prev  Next       SelPg Sel*  Main
```

**Figure 3-7 The JCL Analysis criteria screen**

| SCREEN ITEMS | DESCRIPTION |
|---|---|
| **Application** | The name of the selected Application. |
| **Select** | Selects the object. Valid values are:<br>'**S**'   Select. |
| **Object** | List of all the available JCL objects for the currently selected application. |
| **Object Type** | The object type of the particular JCL object. |
| **Reposition** | Reposition the list of objects starting from the new value entered. The reposition value can be input using either a complete name or part name using an '*' (asterisk) wildcard. For example: |

| Value | Result |
|---|---|
| * | Will reposition at the start of the Object list.<br>For the HOSPITAL system, this would start the object list from object XXCONPDA. |
| XXE* | Will reposition at the first object name that matches the mask XXE or is greater than the mask input.<br>For the HOSPITAL system, this would start the object list from object XXEXIT. |
| XX000G01 | Will reposition at the first object name that matches the mask exactly or is greater than the object name input.<br>For the HOSPITAL system, this would start the object list from object XX001L01 as object XX000G01 does not exist. |

| | |
|---|---|
| **Limit** | Specifies the amount of levels to be checked by the JCL Analysis process. Setting this value to 0 (default) will mean no level limit will be used.<br>The default value may be changed by setting the value in the ANALYSIS-LEVEL-LIMIT parameter in the JCL section of the ###CINI file. |

*Note: For more information on the ###CINI text member parameters ANALYSIS-LEVEL-LIMIT refer to Chapter 2 in the Natural Engineer Administration Guide for Unix manual.*

| PFKEYS | DESCRIPTION |
|---|---|
| **PF1** | Activates the help function. |

| PFKEYS | DESCRIPTION |
|---|---|
| **PF2** | A toggle function that will either show all JCL objects or those JCL objects which have not been previously processed. |
| **PF3** | Exit from the current function and return to previous screen. |
| **PF5** | Will present a list of objects selected to be deleted for review. Confirming the object list will invoke the JCL Analysis batch job via the NATRJE Job Submission screen. |
| **PF6** | Will produce a pop-up confirmation window to invoke the JCL Analysis process interactively. |
| **PF7** | Displays previous page. |
| **PF8** | Displays next page. |
| **PF10** | Will select all objects on the current page. |
| **PF11** | Will select all objects within the application. |
| **PF12** | Returns to the Natural Engineer Main Menu. |

**4**

# APPLICATION INVENTORY

## Chapter Overview

This chapter provides a basic overview of the reporting available for the Application and Environment functions described in this manual.

Once an application has been defined and then extracted from the Natural application library and loaded into the Repository, Natural Engineer provides a series of reports that detail the structure and contents of the applications.

The Application Reports option can be accessed by selecting '**R**' from the Environment Menu screen.

*Note: This chapter does not describe the individual reports available in the Application Reports option from the Environment menu. For more information on these reports refer to the Natural Engineer Reporting manual.*

# Application Reports

The Application Reports provide various levels of Analysis information on the application after it is loaded in the Repository (i.e., before Impact Analysis).

The following list illustrates the Application Reports that are available:

- Extract Source Code Summary
- Missing Objects
- Unused Objects
- Source Code Summary
- Object Summary
- Keywords Summary
- Literals Summary
- Objects Referencing Objects
- Objects Referenced by Objects
- Objects Referenced by DDM fields
- External Objects Referenced by Objects
- Construct Models Referenced by Objects
- DDMs Referenced
- DDMs Referenced by Objects
- DDMs Accessed by Objects
- Database Data Requirements
- Data Item Inventory
- Data Item Usage Inventory

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