

Natural Engineer

Batch Processing for Mainframes

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Readers' comments are welcomed. Comments may be addressed to the Documentation Department at the address on the back cover. Internet users may send comments to the following e-mail address:

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ABOUT THIS MANUAL

Purpose of this manual

This manual contains the Batch Processing (Mainframes) for Natural Engineer.

It describes the Natural Engineer RJE (NATRJE) function which is used to submit batch jobs for the various Natural Engineer options.

The topics include:

- The NATRJE Job Submission screen
- How to Release a locked application
- How reports are selected and submitted

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.
<u>Underlined</u>	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:

⇒	Marks the beginning of an instruction set.
□	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 Batch Processing options of Natural Engineer in the following chapters:

Chapter	Contents
1	Describes the Natural Engineer RJE (NATRJE) option, how to release a locked application and how reports are selected and submitted.

Natural Engineer Batch Processing for Mainframes

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.

About this manual

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 Batch Processing for Mainframes

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 (NEE91-006ALL)

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 (NEE91-008ALL)

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 (NEE91-010WIN)
Natural Engineer Installation Guide for Mainframes(NEE91-010MFR)
Natural Engineer Installation Guide for Unix (NEE91-010UNX)**

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

**4 Natural Engineer Administration Guide (NEE91-040WIN)
Natural Engineer Administration Guide (NEE91-040MFR)
Natural Engineer Administration Guide (NEE91-040UNX)**

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 (NEE91-020WIN)
Natural Engineer Application Management (NEE91-020MFR)
Natural Engineer Application Management (NEE91-020UNX)**

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

**6 Natural Engineer Application Documentation (NEE91-022WIN)
Natural Engineer Application Documentation (NEE91-022MFR)
Natural Engineer Application Documentation (NEE91-022UNX)**

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.

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- 7 Natural Engineer Application Analysis and Modification (NEE91-023WIN)
Natural Engineer Application Analysis and Modification (NEE91-023MFR)
Natural Engineer Application Analysis and Modification (NEE91-023UNX)**

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.

- 8 Natural Engineer Application Restructuring (NEE91-024WIN)
Natural Engineer Application Restructuring (NEE91-024MFR)
Natural Engineer Application Restructuring (NEE91-024UNX)**

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 (NEE91-080WIN)
Natural Engineer Utilities (NEE91-080MFR)
Natural Engineer Utilities (NEE91-080UNX)**

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

- 10 Natural Engineer Reporting (NEE91-025ALL)**

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] (NEE91-026MFR)
Natural Engineer Batch Processing [Unix] (NEE91-026UNX)**

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

- 12 Natural Engineer Messages and Codes (NEE91-060ALL)**

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

- 13 Natural Engineer Web Interface Installation and Configuration Guide(NEA84-010ALL)**

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 (NEE91-017WIN)
Natural Engineer Advanced Services (NEE91-017MFR)
Natural Engineer Advanced Services (NEE91-017UNX)**

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, Business Rule processing and Data Masking.

NATRJE

Chapter Overview

This chapter describes the NATRJE function within Natural Engineer.

Some of the Natural Engineer functions require execution in a batch environment to perform their specific processes. These include functions such as:

- Extract Source Code.
- Load Repository.
- Impact Analysis.
- Apply Modification to objects.
- Produce Reports: Global, Application, Impact and Modification.

Natural Engineer allows batch job submission to be executed online using the NATRJE functionality, driven by the NATRJE Job Submission screen.

The process is controlled by application control record, which is locked at the time of job submission, modified during the job execution as each job step completes and released at the completion of the job.

In the event of any serious failures, the application control record is not released resulting in no further job submission possible until the application is released. This can be done via the NATRJE Job Submission screen, using 'PF9', or using option 'J' (Release Application Lock) from the Options menu.

Use of Natural Engineer's job submission functionality is available on Unix and the following mainframe platforms:

- MVS
- VSE
- BS2000.

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Natural Engineer Batch Processing for Mainframes

Natural Engineer Remote Job Entry screen

When any Natural Engineer function has been selected that requires execution in a batch environment, after all the required inputs have been completed and validated, the NATRJE Job Submission screen will always be displayed.

The following Figure 1-1 illustrates the NATRJE Job Submission screen.

```

                                     - Job Submission -           Application:
Job Selection details
-----
Job Selected   :
Impact Version :
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 1-1 NATRJE Job Submission screen

SCREEN ITEMS	DESCRIPTION
Job selected	This will state which Natural Engineer function has been selected to execute in batch. (This field is non-modifiable).
Impact Version	Will show the version being used for this batch job. This is only shown for Impact related batch jobs. (This field is non-modifiable).
Job Name	<p>This is a mandatory input field, which requires a valid job name to be entered in order for the job to successfully execute.</p> <p>The job name is set to 8 characters and must be entered as per the standards set for the environment in which it will execute. (This will default to the last job executed, details for the same application).</p> <p><i>Note: For the Bulk Extract & Load function the job name that can be entered is limited to 5 characters. A three digit number will then be appended to the job name which will increase per application selected to be processed.</i></p>
Job Class	<p>This is a mandatory input field, which requires a valid job class to be entered. This will tell the operating system what machine resources are to be allocated.</p> <p>The job classes that can be specified will depend on the local standards for the environment in which the job will execute. (This will default to the last job executed, details for the same application).</p> <p><i>NOTE: For BS2000, job class is not shown.</i></p>
<p>The following screen items show the job control record details and reflect the job step execution progress for a job. They are all non-modifiable information fields.</p>	
Control Status	<p>Shows the application control record status. Available status values are:</p> <p>‘N’ Not locked.</p> <p>‘Y’ Locked. Either job is in progress or a job failure has been encountered.</p>
Job Name	Shows either the last job name that was executed for the current application or the current job is still executing.
Opid	The opid of the person submitting the job.
Step	The last completed job step.
Return Code	Not updated, set to 00.

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PFKEYS	DESCRIPTION
PF1	Activates the help function.
PF3	Exit from the current function and return to previous screen.
PF5	Submits the job.
PF6	Refreshes the screen.
PF9	Invokes the Release Application Lock processing.
PF12	Returns to the Natural Engineer Main Menu.

Note: When an application has not had any previous NATRJE jobs execute then the details in the job control record details section will be blank.

Release Application Lock

If an application has had a serious failure, then the application control record will be locked preventing any further job batch job submission for that application. This can be seen with control status being set to 'Y'.

The application can be released using '**PF9**' from the NATRJE Job Submission screen. This will result in a pop-up window being displayed asking for a password.

The password is set to '**GENRJE01**' by default. The password may be changed by modifying the Natural Engineer User Exit, NEEUEX1 which is located in the SYSNEE library.

The following Figure 1-2 illustrates the Application Release Authorization pop-up window.

```

- Job Submission -           Application: HOSPITAL

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

Application Release Authorization Screen

Password:

PF3 - Exit

Control Status  : Y
Last Job Submitted - Job Name  : XGSLPN01
                  - Opid      : XGSLPN
                  - Step      : CTRLUPD
                  - Return Code : 00

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
Help      Exit      Sub  Ref              Rel              Main
Application is Currently Locked. No Job Submission Possible

```

Figure 1-2 Application Release Authorization pop-up window

After typing in the password use the '**ENTER**' key. This will give you the Application Batch Release screen.

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Natural Engineer Batch Processing for Mainframes

The following Figure 1-3 illustrates the Application Batch Release screen.

```
          - Application Batch Release -  
  
Job Control Record details for Application : HOSPITAL  
-----  
          Control Status : Y  
  
Last Job Submitted - Job Name   : XGSLXXXX  
                   - Job Class  : X  
                   - Opid       : XGSLXX  
                   - Step       : CTRLUPD  
                   - Return Code : 00  
  
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---  
      Exit      Upd                               Main
```

Figure 1-3 Application Batch Release screen

SCREEN ITEMS	DESCRIPTION
Application	The application name used for the last submitted job.
Control Status	This will be set to 'Y' (locked). After releasing the application this will update to show 'N' (unlocked).
Job Name	The Job Name used for the last submitted job.
Job Class	The Job Class used for the last submitted job.
Opid	The opid used for the last submitted job.
Step	The last completed job step.
Return Code	Always set to '00'.

PFKEYS	DESCRIPTION
PF3	Exit from the current function and return to previous screen.
PF5	Releases the locked application. The control status will be updated to 'N' (unlocked). Batch jobs can now be submitted again for the application.
PF12	Returns to the Natural Engineer Main Menu.

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Locked applications can also be released by selecting option 'J' (Release Application Lock) from the Options Menu. This method requires an application to be selected first and the selected application must have a control status of 'Y' (locked).

The password is the same as before and once entered, results in the display of the Application Batch Release screen (refer to Figure 1-3).

The following Figure 1-4 illustrates the Application Release Authorization pop-up window when using 'J' (Release Application Lock) from the Options Menu.

```

                                     - Options Menu -           Application: HOSPITAL
                                                                Version: 01
Code  Function
-----
R     Global Reports
T     Maintain Default Text Logic Members

```

```

Application Release Authorization Screen

Password:

PF3 - Exit

```

```

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

```

Figure 1-4 Application Release Authorization pop-up window

Requesting Reports through Natural Engineer RJE

When any of the reporting options: Global, Application, Impact and Modification, are requested they will be submitted as a batch job with the report details found within the job output files.

When selecting one of the reporting options, the Reports Selection List screen is displayed to select the report or reports required. After selection has been made the NATRJE Job Submission screen will be displayed. At least one report selection must be made, if NO reports are selected, then the NATRJE Job Submission process will not be invoked.

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Natural Engineer Batch Processing for Mainframes

Example of Report Request (REPREP)

This example uses the Application Reports option. The process is exactly the same for the Global Impact and Modification report options.

The following Figure 1-5 illustrates the Environment Menu screen where option 'R' (Application Reports) will invoke the Reports Selection List screen.

```

          - Environment Menu -      Application: HOSPITAL
                                   Version: 01
Code  Extract & Load Functions      Code  Object Inventory
-----
S    Extract & Load Selection Criteria  A    Application Management
E    Extract Source Code                F    Field Viewer
L    Load Repository                    B    Object Explorer
X    Extract & Load
D    Extract Load & Impact
O    Extract Missing Objects
-----

Code  Application Reports            Code  Miscellaneous
-----
T    Application Metrics              ?    Help
R    Application Reports              .    Exit
-----

                                   Code.... R

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

Figure 1-5 Environment Menu screen

From the Environment menu, option 'R' is selected to produce Application Reports. This invokes the Application Reports Selection List screen, which will list all the Application reports available

The following Figure 1-6 illustrates the Reports Selection List screen showing the Application Reports available for selection.

```

- Reports Selection List -      Application: HOSPITAL
                                Version: 01

Sel  Report Name
-    Extract Source Code Summary
-    Missing Objects
-    Unused Objects
-    Source Code Summary
-    Object Summary
-    Keywords 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

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

Figure 1-6 Reports Selection List screen showing the Application Reports available

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

Sel	Selects the report. Valid values are: 'S' Select report 'D' De-select report.
Report Name	The name of each report available for each of the reporting options: Global, Application, Impact and Modification. When a report has been selected, an asterisk (*) appears to the left of the report name.

PFKEYS	DESCRIPTION
---------------	--------------------

PF1	Activates the help function.
PF3	There are two possible actions: 1. If no reports have been selected, then exit from the current function and return to previous screen. 2. If at least 1 report has been selected, then invoke the NATRJE Job submission screen.
PF7	Displays previous page.
PF8	Displays next page.
PF12	Returns to the Natural Engineer Main Menu.

Reports are selected by using 'S' next to the report and using the 'ENTER' key. This will result in an asterisk (*) appearing next to the selected report.

The following Figure 1-7 illustrates the Application Reports Selection List screen after reports have been selected.

```

- Reports Selection List -      Application: HOSPITAL
                                Version: 01

Sel  Report Name
-   * Extract Source Code Summary
-   * Missing Objects
-   * Unused Objects
-   * Source Code Summary
-   Object Summary
-   Keywords 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

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

Figure 1-7 Reports Selection List screen after reports have been selected

1

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Once all required reports are selected, use 'PF3' (Exit) to pass control to the Natural Engineer RJE Job Submission screen.

The following Figure 1-8 illustrates the NATRJE Job Submission screen for Application Reports.

```

                                     - Job Submission -           Application: HOSPITAL

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 1-8 NATRJE Job Submission screen for Application Reports

Now the job can be submitted using 'PF5' (Sub).

NATRJE User Exit

A user exit is available for use with the NATRJE function, which allows any local standard security issues to be controlled.

The user exit is NEEUEX2 and is located on the FNAT library SYSNEE. The default code in the user exit will call NATRJE directly. Any local changes required can be applied directly to NEEUEX2 and then stowed on SYSNEE.

Note: The user exit is named 'NEEUEX2X' on the FNAT SYSNEE library supplied in the product INPL. This is to avoid overwriting any existing (modified) versions on the production SYSNEE library during load.

The following Figure 1-9 illustrates the default NEEUEX2 source code.

```
0010 DEFINE DATA PARAMETER
0020 01 #NATRJE-CARDS      (A80/1:50)
0030 01 #NATRJE-COUNT     (B4)
0040 01 #NATRJE-FLAG      (A1)
0050 01 #NATRJE-RETHEX    (B2)
0060 END-DEFINE
0070 /*
0080 CALL 'NATRJE' #NATRJE-CARDS(1:50)
0090 #NATRJE-COUNT
0100 #NATRJE-FLAG
0110 #NATRJE-RETHEX
0120 /*
0130 END
```

Figure 1-9 Default NEEUEX2 source code

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