Example Software Currently Controlled by the
WVDP Software Control Program

1. Analytical Laboratory to VAX Interface:

ICP-TO-VAX

The purpose of the ICP-to-VAX interface is to automatically acquire laboratory results emanating from an Instruments SA JY-70 inductively Coupled Plasma Spectrometer (ICP) and place them in RS/1 tables within the Laboratory Information Management System (LIMS) database. These results consist of the elemental compositions of each constituent, which for Vitrification purposes are used for melter feed makeup, melter feed verification and glass compositional verification.

ND-TO-VAX

The ND-to-VAX interface dynamically collects nuclide concentrations in waste samples by analyzing them in a gamma spectrometer, Nuclear Data ND-6700 and automatically places them in the lab LIMS. This instrument is presently being used for gamma analyses throughout the plant and will be used by Vitrification when the hot operations phase of the project begins. Device drivers were written both on the VAX and on the ND-6700 in order to interface this instrument. Industry standard protocol practices including checksumming, message packetting and retransmits were utilized when developing this interface. The transmission media for the ND-6700 is identical to the ICP media (RS-232C short haul modems using phone lines).

2. DCS-TO-VAX Interface:

The purpose of the DCS-to-VAX interface is to acquire all the process variables needed to monitor the operation of the Vitrification Process and to automatically build a database containing the resultant information. This is accomplished by a Fortran based device driver which automatically acquires data from the DCS using an RS-232C interface port. This data is extensively error checked and transferred via an industry standard protocol. The Tags of interest (those being collected at any one time) are contained in a VAX Tag Configuration Table, which contains up to 320 tags and is easily modifiable.

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UNCONTROLLED

WEST VALLEY
NUCLEAR SERVICES COMPANY
INCORPORATED

ENGINEERING PROCEDURE

NO.	Rev.	Date
EP-3-013	0	07/03/89

SUBJECT

Determination of Software Requirements

APPROVED
D. K. Ploetz
Plant Engineering Manager

1.0 PURPOSE

This is the initial procedure for addressing software control at WVNS. It identifies appropriate additional procedures to be followed for software development, documentation, review, control, testing, and use.

This procedure applies to all software that is essential to meeting the Waste Acceptance Specification (WAS, Document #OGR/B-9), as identified in the Waste Compliance Plan (WCP, Document #WVNS-WCP-001). It excludes software such as word processing software, operating system software, and business system software. It also excludes software that is controlled by other procedures, such as that used as part of measuring and test equipment.

2.0 RESPONSIBILITIES

2.1 Cognizant System Process/Design Manager(CSPM/CSDM) - Designates a code custodian for each code for which this procedure is applicable; reviews and concurs with the selections made on the Software Requirements Form(SRF); reviews and concurs with any changes made to the completed Software Requirements Form.

2.2 Code Custodian - Obtains a document number of the format WVNS-VSC-XXX from Records Management to be used as the Internal Software ID Number; completes a Software Summary Form (SSF); selects appropriate Software Requirements Form and supplies the indicated information. If the code custodian and the code developer are not the same individual, the software requirements form must be completed in conjunction with the code developer. The code custodian then ensures that all required actions take place in order for the code to be placed in configuration management.

2.3 Code Developer - Supplies required information to the code custodian and assists in completing the appropriate Software Requirements Form.

2.4 Records Management - Assigns a document number to each piece of software at the request of the Code Custodian. This number will be referred to as the Internal Software ID Number throughout the series of Software Control Procedures.

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3.0 DEFINITIONS

3.1 Acquired Software - Software and/or documentation obtained by procurement or transfer from outside WVNS.

3.2 Application - Use of software to perform calculations or to manipulate data.

3.3 Backup Copy - A copy of a data file, software, etc., on magnetic media or as a computer listing that is retained in the event the original copy is destroyed or lost.

3.4 Benchmarking - A type of verification in which a test problem is run on two or more comparable computer codes; used to ensure correct computer model operation or to compare software.

3.5 Class Determination - Designation of category of software. The selection of a category in turn determines other requirements. Classes are: Engineering/Scientific software, support software, or system-maintained software.

3.6 Computer Code - A set of computer instructions for performing the operations specified in a numerical model (Ref. NUREG-0856).

3.7 Code Custodian - The person designated to be responsible for accomplishing the actions required for configuration management of a specific code; this individual is generally the main point of contact and authority for a specific code.

3.8 Code Developer - The person primarily responsible for development or modification of an Engineering/Scientific code, or a segment thereof.

3.9 Computer Model - Engineering/Scientific software and data representing a specific process or system.

3.10 Configuration Management - 1) A system for orderly control of software including methods for labeling, changing, and storing software and its associated documentation; 2) The systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in an item of software after establishment of its configuration management.

3.11 Conversion Testing - Testing performed to ensure that calculated results obtained with software installed on a specific computer are consistent with results obtained on the computer on which the software was originally developed.

3.12 Data - Representation of facts/concepts in a formalized manner suitable for communication, interpretation, or processing by human or automatic means.

3.13 Design Documentation - Documentation, exhibits, memos, and/or other information used to ensure understanding, traceability and reproducibility of software development. 1) For Engineering/Scientific software, documentation of software design that includes a description of mathematical models and numerical methods, and a user's manual; 2) For support or system-maintained software, documentation that includes at a minimum a user's manual.

3.14 Design Input - Input to the software development process, including bases for software design, functional requirements, performance requirements, regulatory requirements, codes and standards.

3.15 Engineering/Scientific Software - A class of software that reads input data, computes results, and provides output calculations for use in performing an analysis or making an inference; can be used to generate reportable results.

3.16 Final Internal Development Review (FIDR) - A formal review process that compares modified or developed Engineering/Scientific software and its documentation to its design input and design documentation requirements, evaluates the technical validity of the software, and approves software for configuration control, verification and/or validation.

3.17 Hard Copy - A computer-produced copy of information in human-readable form on paper or microfiche.

3.18 Independent Technical Review - A documented critical review by qualified independent personnel to provide assurance that information is correct and satisfactory. The review personnel should be taken from the WVNS Technical Specialist List whenever possible.

3.19 Internal Software ID - The document number that is assigned to a specific piece of software by Records Management at the request of the Code Custodian. This number will appear on the Software Summary Form and on every page of output associated with this code as well as on other forms used in the development, review, and configuration management of the code.

3.20 Internal Testing - Informal testing of software performed during the development process; may be used to support verification, but not in place of the verification process.

3.21 Magnetic Media - Tapes, disks, or diskettes used to record and store information in computer-readable form.

3.22 Numerical Method - A procedure for solving a problem primarily by a sequence of arithmetic operations. (Ref. NUREG-0856)

3.23 Numerical Model - (Also referred to as a mathematical model) A representation of a process or system using numerical methods.

3.24 Operating System Software - A collection of software remaining permanently on a computer to provide overall coordination and control of the operation of the hardware; includes compilers, link editors, and similar software.

3.25 Permanent Software Documentation Package - The collection of documentation that is maintained by Records Management for any specific code. It contains, initially, the documentation that is required at initiation of configuration management, and is updated as required.

3.26 Planning Document - The document(s) defining the requirements that must be met by an Engineering/Scientific code to be developed or modified at WVNS.

3.27 Secure Storage - Controlled access, limited to individuals that are properly authorized.

3.28 Software - See computer code.

3.29 Software Development - The process by which new software (or a software segment) is created, including modification of the logic of existing software.

3.30 Software Documentation Package - The collection of documentation that is maintained by the Code Custodian for specific code. The contents of this package will be dependent upon the class of software and would include an SSF, an SRF, and other items such as procurement documents, FIDR results, testing results, user's manuals, and required log sheets. This documentation must be retained by the Code Custodian in a manner that restricts access and ensures the integrity of the package. Backup copies of the software would be an adjunct to this package.

3.31 Software Life Cycle - That period of time in which the software is conceived, developed, and used (Ref. NUREG-4640).

3.32 Software Summary Form, WV-1860, (attachment A) - A one-page document which identifies the code and version number and gives other basic information (Ref. NUREG-0856).

3.33 Stream of Commands - A sequence of instructions executing system maintained software; supplied by the user for an application of the software.

3.34 Support Software - 1) A class of software that performs a specific function in support of Engineering/Scientific software, or system-maintained software, examples: conversion of units, change of data format, plotting of data, mesh generation for Finite Element Modeling (FEM); 2) Stream of commands executed to utilize system-maintained software from which reportable results are generated.

3.35 System-Maintained Software - A class of software that is installed and maintained at the computer system level rather than at the user level, but that is peripheral to the operation of the hardware (e.g., commercial software such as Lotus 1-2-3, RS/1, or DISSPLA); can be used to generate reportable results.

3.36 User's Manual - Documentation of software that supplies adequate information to the user to allow preparation of input and understanding of format and/or contents of output.

3.37 Validation - 1) A demonstration that a computer model adequately describes physical reality over the range of variables of interest; 2) Assurance that a model as embodied in a computer code is a correct representation of the process or system for which it is intended (Ref. NUREG-0856).

3.38 Verification - 1) A demonstration that software correctly solves mathematical equations and performs the data processing it was designed to perform; 2) Assurance that a computer code correctly performs operations specified in a numerical model (Ref. NUREG-0856).

3.39 Version - An item of software or documentation that is identifiably different from the original item.

4.0 GENERAL

4.1 Requirements Documents

This procedure provides the framework for compliance with the applicable requirements documents:

4.1.1 ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Power Plants, Supplementary Requirements for Design Control

4.1.2 OCR/B-14, Quality Assurance Requirements for High-Level Waste Form Production

4.1.3 NUREG-0856, Final Technical Position on Documentation of Computer Codes for High-Level Waste Management

4.2 Applicable Engineering Procedures

Compliance with the documents listed in section 4.1 is accomplished by a group of procedures, each regulating a specific aspect of software control:

EP-3-014, "Final Internal Development Review of Software and Documentation (FIDR)" - Provides a technical review of software developed at WVNS; ensures the code meets its stated requirements and that all required documentation is in order.

EP-3-015, "Transfer of Software, Data, and/or Documentation" - Controls the transfer of software, associated input/output data, and/or documentation to and from the WVNS.

EP-3-016, "Software Configuration Management" - Details the means by which software is controlled, including such items as physical storage, user access, methods of altering controlled software, and transfer of custody.

EP-3-017, "Conversion Testing, Verification ,and/or Validation of Software" - Describes the methods and requirements for testing software following development or acquisition. Level and type of testing is dependent upon the type of software.

EP-3-018, "Software Application Control" - Provides the means for properly identifying computer codes that are used in design analyses, thus furnishing assurance that the final results are based upon the use of software that is appropriate for the application and adequately controlled.

4.3 Completion of the Software Summary Form

The Software Summary Form, WV-1860 (SSF, attachment A) is to be completed by the Code Custodian for each piece of software to which this procedure applies. The requests for information are self-explanatory with the following exceptions:

Item 04: The software date refers to the identifying date associated with the current version of the software.

Item 06: The internal software ID number is a document number with the prefix WVNS-VSC that is assigned by Records Management at the request of the Code Custodian. It appears on all documentation and on each page of output associated with the code.

Item 13: These are key words that identify the applicability of the code and could be entered into a database or other indexing program for retrievability of the specific software.

4.4 Completion of the Software Requirements Form

The applicable procedures for any specific computer code will be selected via a Software Requirements Form (SRF) by the code custodian. The Requirements Form used will be:

SRF for Engineering/Scientific Software, WV-1861 (attachment B)
SRF for Support Software, WV-1862, (attachment C)
SRF for System-Maintained Software, WV-1863 (attachment D)

These procedures will then be implemented by the appropriate personnel as listed in section 2.0 of each procedure.

Required instructions for completion of the Software Requirements Form and the Software Summary Form are contained on the appropriate attachment. If software is proprietary, requirements that violate the software license shall not apply. Such exceptions to requirements shall be noted and explained in the additions and exceptions section of the appropriate Software Requirements Form.

An independent technical review may be required upon completion and prior to approval of the Software Requirements Form for Engineering/Scientific software that has been developed or modified at WVNS. This will be at the discretion of the CSPM/CSDM, who will then be responsible for appointing reviewers who are competent in the discipline and independent from the development/modification process.

(NOTE: The completion of the Software Requirements Form for Engineering/Scientific software that has been developed or modified at WVNS will be performed by the code custodian in conjunction with the code developer.)

Instructions for specific sections of specific forms are as follows:

4.4.1 Determination of Options For EP-3-017, "Conversion Testing, Verification, and/or Validation of Software" (Section II of the SRF for Engineering/Scientific Software, WV-1861, attachment B)

Question 11: If there are qualified individual(s) on-site who have not participated in the development of the code, they may be identified as "independent reviewers". Otherwise, individual(s) from outside WVNS must be designated as reviewers by selecting definition 2 or 3. The appropriate option is selected by the code custodian with concurrence of the CSPM/CSDM.

4.4.2 Design Input Requirements (Section III of the SRF for Engineering/Scientific Software, WV-1861, attachment B):

Design input requirements apply only to Engineering/Scientific software that is developed or modified at WVNS and are contained in the planning document for the specific code. If the following requirements are not addressed in the planning document, the code custodian. in conjunction with the code developer, shall evaluate the need for their inclusion in the Software Requirements Form:

A. Bases for design (e.g., physical and chemical phenomena to be accounted for or known to be neglected; input or output formats)

B. Performance requirements (e.g., maximum CPU time, memory requirements

C. Regulatory requirements (e.g., NUREG-0856 or other specified requirements)

D. Codes and standards (e.g., IEEE-std-730-1984)

4.4.3 Design Documentation Requirements

Design documentation for each software class shall include at a minimum the following:

A. Engineering/Scientific Software: mathematical models and numerical methods description, and user's manual. The specific items selected for inclusion are so indicated on the appropriate Software Requirements Form for Engineering/Scientific Software, WV-1861 (attachment B - Section IV).

B. Support Software: user's manual. The specific items selected for inclusion are so indicated on the appropriate Software Requirements Form for Support Software, WV-1862 (attachment C - Section II).

4.4.4 Change of an Approved Software Requirements Form

In order to make changes in an approved Software Requirements Form (SRF), the CSPM/CSDM shall assure that a revised SRF is issued in accordance with this EP and receives the same approval as the original. A revised SRF shall be indicated by sequentially assigning a revision number, where the initial SRF shall be designated as Revision No. 0. The revised SRF shall be delivered to the code custodian for inclusion in the Permanent Software Documentation Package, per EP-3-016, Software Configuration Management.

5.0 PROCESSING

RESPONSIBILITY	ACTION
5.1 Cognizant System Process/ Design Manager (CSPM/CSDM)	A. Upon initialization of code development or receipt of procured code, appoints a code custodian.
5.2 Code Custodian	A. Designates the class of software.
	B. Completes a Software Summary Form, WV-1860 (attachment A).
	C. Completes the appropriate Software Requirements Form; WV-1861, WV-1862, or WV-1863 (attachments B, C, or D).

RESPONSIBILITY	ACTION
5.3 CSPM/CSDM	A. Reviews the SRF for: Appropriateness of class selection Design documentation requirements Design input Testing options Applicable EPs Completeness of the form.
	B. Initiates an independent review of the SRF if required.
	C. Approves the SRF.
	D. Returns the SRF to the code custodian.
5.4 Code Custodian	A. Retains the SRF for inclusion in the Permanent Software Documentation Package per EP-3-016, Software Configuration Management, and for retention in the Software Documentation Package.
	B. Initiates the actions indicated by the selected procedures.

6.0 REFERENCES

6.1 ANSI/ASME NQA-1, 1986, Quality Assurance Program Requirements for Nuclear Facilities, Supplement 3S-1: Supplementary Requirements for Design Control.

6.2 NUREG-0856, Final Technical Position on Documentation of Computer Codes for High-Level Waste Management.

6.3 NUREG/CR-4640, Handbook of Software Quality Assurance Techniques Applicable to the Nuclear Industry.

6.4 OGR/B-9, Waste Acceptance Preliminary Specification for the West Valley Demonstration Project High-Level Waste Form

6.5 OGR/B-14, Quality Assurance Requirements for High-Level Form Production.

6.6 WVNS-WCP-001, Waste Compliance Plan for the West Valley Demonstration Project High-Level Waste Form

7.0 ATTACHMENTS

7.1 Attachment A - Software Summary Form, WV-1860 (latest revision)

7.2 Attachment B - Software Requirements Form for Engineering/Scientific Software, WV-1861 (latest revision)

7.3 Attachment C - Software Requirements Form for Support Software, WV-1862 (latest revision)

7.4 Attachment D - Software Requirements Form for System Maintained Software, WV-1863 (latest revision)

7.5 Attachment E - Flowchart of Software Control Program

ATTACHMENT A

SOFTWARE SUMMARY FORM

01. Summary date ___/___/___

02. Summary prepared by _____

03. Summary action: _____ New
_____ Deletion
_____ Replacement

04. Software date ___/___/___

05. Software Title and Version _____

_____

06. Internal Software ID _____

07. Software Type: _____ Computer Program
_____ Subroutine/module

08. Processing Mode: _____ Interactive
_____ Batch

09. Application Area: General
_____ Engineering/Scientific
_____ Support
_____ System Maintained

Specific
List specific applications:

10. Submitting organization and address:

11. Technical Contact(s) _____

_____

12. Narrative (brief description of code and its uses):

13. Keywords:

ATTACHMENT A (CONTINUED)

SYSTEM INFORMATION

14. Computer manufacturer and model _____

_____

15. Computer operating system _____

16. Programming language _____

17. Number of source program statements _____

18. Computer memory requirements _____

19. Tape drives _____

20. Disk/drum units _____

21. Terminals _____

22. Other operation requirements:

23. _____
Code Custodian Date

ATTACHMENT B

SOFTWARE REQUIREMENTS FORM
ENGINEERING/SCIENTIFIC SOFTWARE
Revision no. _____

Answer every question or, if appropriate for questions with a line in front of the question number, specify not applicable, N/A. If not otherwise specified, proceed to the next question in sequence.

1) Software Name (and version, if applicable) _____

2) Name of Code Custodian _____
3) Code Developer _____
4) Function of this Engineering/Scientific software:

SECTION I: Determination of Required Software Control Procedures (see pg. 23 of this attachment for a flowchart of the sequence).

5) Is this Engineering/Scientific software going to be acquired from outside WVNS?

_____ yes
_____ no (Mark N/A on questions 6-8. Go to question 9.)

6) Identify software origin and version(s):

7) Describe available software documentation and version(s):

8) Will this Engineering/Scientific software and/or its design documentation be modified at WVNS:

_____ yes Required EPs (in addition to this procedure, "Determination of Software Requirements") in order of application:

EP-3-015 - "Transfer of Software, Data, and/or Documentation"
EP-3-014 - "Final Internal Development Review of Software and Documentation (FIDR)"
EP-3-016 - "Software Configuration Management"
EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"
EP-3-018 - "Software Application Control"

(Indicate required EPs in Section V. Mark N/A on question 9)

ATTACHMENT B (CONTINUED)

Revision no. _____
Software name and version _____

_____ no Required EPs (in addition to this procedure, "Determination of Software Requirements") in order of application:

EP-3-015 - "Transfer of Software, Data, and/or Documentation"
EP-3-016 - "Software Configuration Management"
EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"
EP-3-018 - "Software Application Control"

(Indicate required EPs in Section V. Mark N/A on question 9. Go to question 10.)

9) Is this Engineering/Scientific software and/or its design documentation going to be developed at WVNS?

_____ yes Required EPs (in addition to this procedure, "Determination of Software Requirements") in order of application:

EP-3-014 - "Final Internal Development Review of Software and Documentation (FIDR)"
EP-3-016 - "Software Configuration Management"
EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"
EP-3-018 - "Software Application Control"

(Indicate required EPs in Section V.)

_____ no This is existing software (Go to question 9a)

9a) Will existing software be modified?

_____ Yes Required EPs (in addition to this procedure, "Determination of Software Requirements":

The EPs identified by answering question 8 "no" are required, with the exception of EP-3-015, "Transfer of Software, Data, and/or Documentation"

_____ No Required EPs (in addition to this procedure, "Determination of Software Requirements":

The EPs identified by answering question 8 "no" are required, with the exception of EP-3-015, "Transfer of Software, Data, and/or Documentation"

ATTACHMENT B (CONTINUED)

Revision no. _____
Software name and version _____

SECTION II: Determination of Options for EP-3-017, "Conversion Testing, Verification, and/or Validation of Software"

10) Is conversion testing required for this acquired Engineering/Scientific software? (Applicable if Engineering/Scientific software is acquired from outside WVNS and is being installed on a different computer or computer operating system than was used for code development.)

_____ yes (Indicate so under Section V)
_____ no

11) Is independent verification required?

_____ yes (Indicate so under Section V.)

_____ "Independent" is defined to be verification by competent WVNS individual(s) other than those from whom the work originated (they may be users, but they shall not have designed or developed the software).

_____ "Independent" is defined to be verification by competent individual(s) outside WVNS.

_____ "Independent" is defined to be verification by:

_____ no

12) Is validation required?

_____ yes (Indicate so under Section V.)
_____ no

SECTION III: Design Input (applicable if answer to question 8, 9, or 9a is "yes")

13) List planning documents (title and page numbers) containing design input (see section 4.4.2).

14) Is additional design input attached (see section 4.4.2)?

_____ yes (List additional input)

_____ no

ATTACHMENT B (CONTINUED)

Revision no. _____
Software name and version no. _____

SECTION IV: Design Documentation (applicable if answer to question 8, 9, or 9a is "yes". Mark all items to be included)

15) Mathematical models and numerical methods descriptions shall include:

_____ Design input (i.e., documentation of items 13 and 14)
_____ Statement and description of the problem
_____ Applicable assumptions and limitations (e.g., appropriateness of algorithms)
_____ Numerical techniques/methods
_____ Relevant discretized (or otherwise transformed numerical solution) equations and derivations
_____ Numerical stability and accuracy of methods
_____ Notation for variables and equations
_____ Important computational characteristics
_____ References and sources
_____ Other _____

16) User's manual shall include:

_____ Hardware requirements including computer type and operating system
_____ Software listing (handwritten, computer generated, or on microfiche)
_____ Testing documentation relevant to Final Internal Development Review
_____ Structure and organization of the software by flowchart, software design language, or other appropriate means
_____ Data input and output information
_____ Model and system interfaces
_____ Coding standards
_____ Sample and/or test problems
_____ Input/output requirements (e.g., libraries and compilers)
_____ Other _____

17) Do planning documents require compliance to a specific standard(s)?

_____ yes (Identify the standard(s)

_____ no

ATTACHMENT B (CONTINUED)

Revision no. _____
Software name and version _____

SECTION V: Summary of Required EPs

__X__ EP-3-013 - "Determination of Software Requirements"

_____ EP-3-014 - "Final Internal Development Review (FIDR)"

_____ EP-3-015 - "Transfer of Software, Data, and/or Documentation"

_____ software
_____ documentation
_____ data

__X__ EP-3-016 - "Software Configuration Management"

__X__ EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"

_____ conversion Testing
__X__ verification (independent? _____ yes _____ no)
_____ validation

__X__ EP-3-018 - "Software Application Control"

SECTION VI: Additions or Exceptions to Questions 1-17 (attach additional pages is necessary)

18) Describe any additions or exceptions to the above:

19) Provide explanations for additions or exceptions

SECTION VII: Approvals of Answers to Questions 1-19

20) Prepared by:

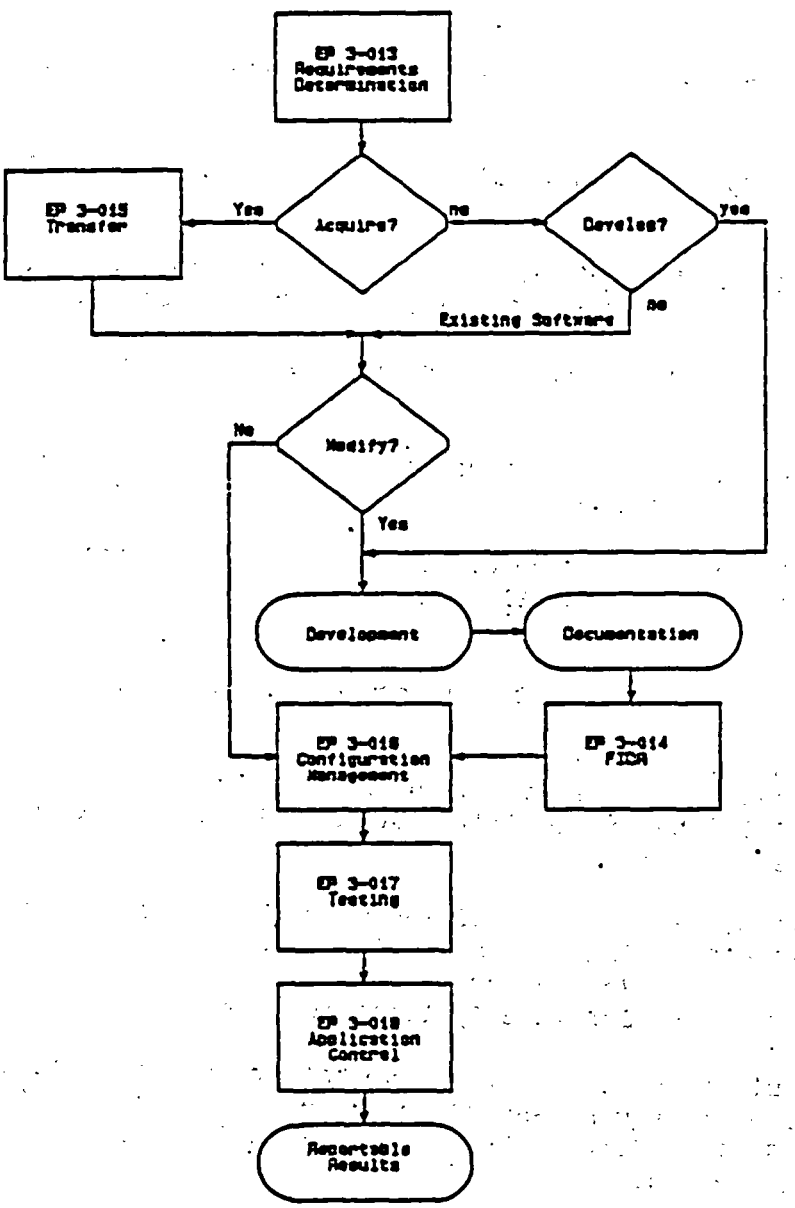
_____
Signature Date

21) Approved by:

_____
Cognizant System Process/Design Manager Date

ATTACHMENT B (CONTINUED)

Engineering/Scientific Software



Form No. QV-(CQI

ATTACHMENT C

SOFTWARE REQUIREMENTS FORM
SUPPORT SOFTWARE
Revision no. _____

Answer every question, or if appropriate for a question with a line in front of the question number, specify not applicable, N/A. If not otherwise specified, proceed to the next question in sequence.

1) Software Name (and version, if applicable) _____
2) Name of Code Custodian _____
3) Function of this support software:

4) Is this support software a stream of commands used to execute system maintained software?

_____ Yes Identify name and version of system maintained software
_____ No

SECTION I: Determination of Required Software Control Procedures (see pg. 27 of this attachment for a flowchart of the sequence).

5) Will this support software receive repeated use of be used by multiple users?

_____ Yes Required EP (in addition to this procedure, "Determination of Software Requirements"):

EP-3-016 - "Software Configuration Management"
(Indicate required EP in Section III)

_____ No

6) Is this support software going to be acquired from outside WVNS?

_____ Yes Required EPs (in addition to this procedure, "Determination of Software Requirements") in order of application (apply EP-3-016 before EP-3-018, of EP-3-016 is required from question 5):

EP-3-015 - "Transfer of Software, Data and/or Documentation"
EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"
EP-3-018 - "Software Application Control"

_____ No Required EPs (in addition to this procedure, "Determination of Software Requirements") in order of application (apply EP-3-016 before EP-3-018, if EP-3-016 is required from question 5):

EP-3-017 - "Conversion Testing, Verification, and/or Validation of Software"
EP-3-018 - "Software Application Control"
(Indicate required EPs in Section III. Mark N/A on questions 7 and 8. Go to question 9.)

ATTACHMENT C (CONTINUED)

Revision no. _____
Software name and version _____

7) Identify software origin and version(s):

8) Describe available software documentation and version(s):

SECTION II: Design Documentation (Mark all items to be included)

9) User's manual shall include:

_____ Hardware requirements including computer type and operating system
_____ Software listing (handwritten, computer generated or on microfiche)
_____ Testing documentation
_____ Structure and organization of the software by flowchart, software design language, or other appropriate means
_____ Data input and/or output information
_____ Model and system interfaces
_____ Coding standards
_____ Sample and/or test problems
_____ Input/output requirements (e.g., libraries and compilers)
_____ Other _____

SECTION III: Summary of Required EPs

__X__ EP-3-013, "Determination of Software Requirements"

_____ EP-3-015, "Transfer of Software, Data and/or Documentation"

_____ Software
_____ Documentation
_____ Data

_____ EP-3-016, "Software Configuration Management"
__X__ EP-3-017, "Conversion Testing, Verification, and/or Validation of Software"

_____ conversion testing
_____ verification
_____ validation

__X__ EP-3-018, "Software Application Control"

SECTION IV: Additions or Exceptions to Questions 1-9 (attach additional pages if necessary)

10) Describe any additions or exception to the above:

11) Provide explanations for additions of exceptions:

ATTACHMENT C (CONTINUED)

Revision no. _____
Software name and version no. _____

SECTION V: Approvals of Answers to Questions 1-11

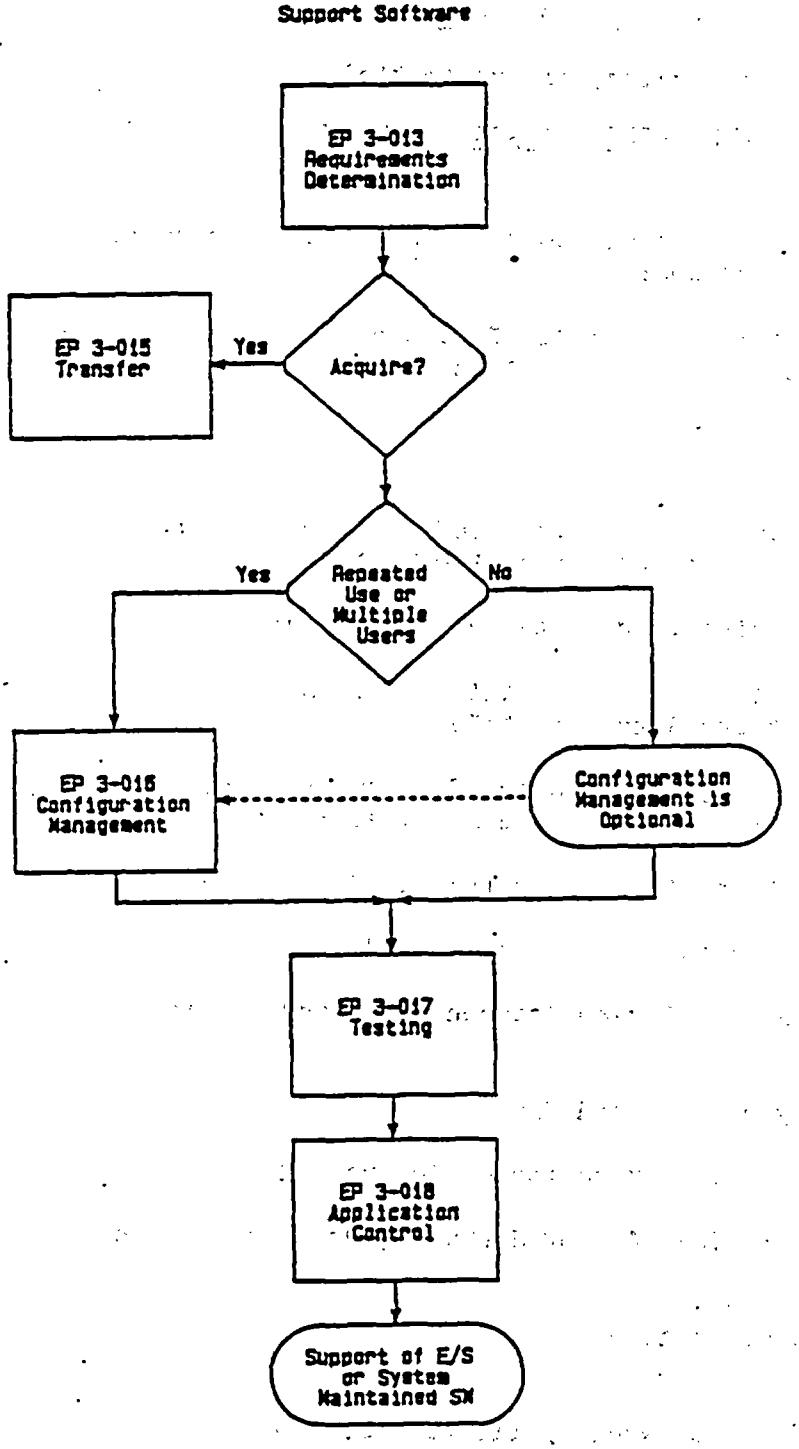
12) Prepared by:

_____
Signature Date

13) Approved by:

_____
Cognizant System Process/Design Manager Date

ATTACHMENT C (CONTINUED)



ATTACHMENT D

SOFTWARE REQUIREMENTS FORM
SYSTEM MAINTAINED SOFTWARE
Revision no._____

Answer every question or, if appropriate for a question with a line in front of the question number, specify not applicable, N/A, If not otherwise specified, proceed to the next question in sequence.

1) Software name (and version, if applicable) _____
2) Code custodian _____
3) Function of this system maintained software:

4) Does this system maintained software require a stream of commands to execute various options:

_____ Yes (Class each stream of commands as support software in accordance with Section 3.33)
_____ No Explain:

SECTION I: Determination of Required Software Control Procedures (See page 30 of this attachment for a flowchart of the sequence).

5) Is this system maintained software to be acquired?

_____ Yes Required EP (in addition to this procedure, "Determination of Software Requirements")

EP-3-015 - "Transfer of Software, Data, and/or Documentation" (Indicate required EP in Section II)

_____ No Software is already installed on the system

6) Identify origin (vendor) or software and version(s):

7) Describe available software documentation and version(s):

SECTION II: Summary of Required EPs

__X__ EP-3-013 - "Determination of Software Requirements"

_____ EP-3-015 - "Transfer of Software, Data, and/or Documentation"

_____ software
_____ documentation
_____ data

__X__ EP-3-018 - "Software Application Control"

ATTACHMENT D (CONTINUED)

Revision no. _____
Software name and version no. _____

SECTION III: Additions and Exceptions to Question 1-7 (attach additional pages if necessary)

8) Describe any additions or exceptions to the above:

9) Provide explanations for additions or exceptions:

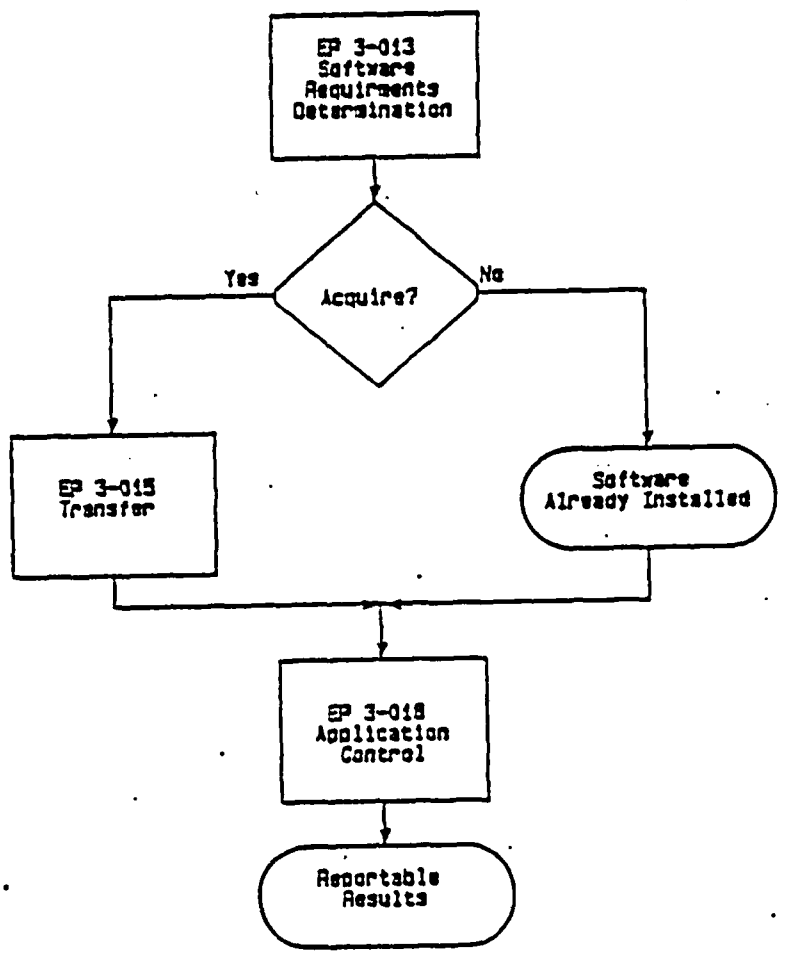
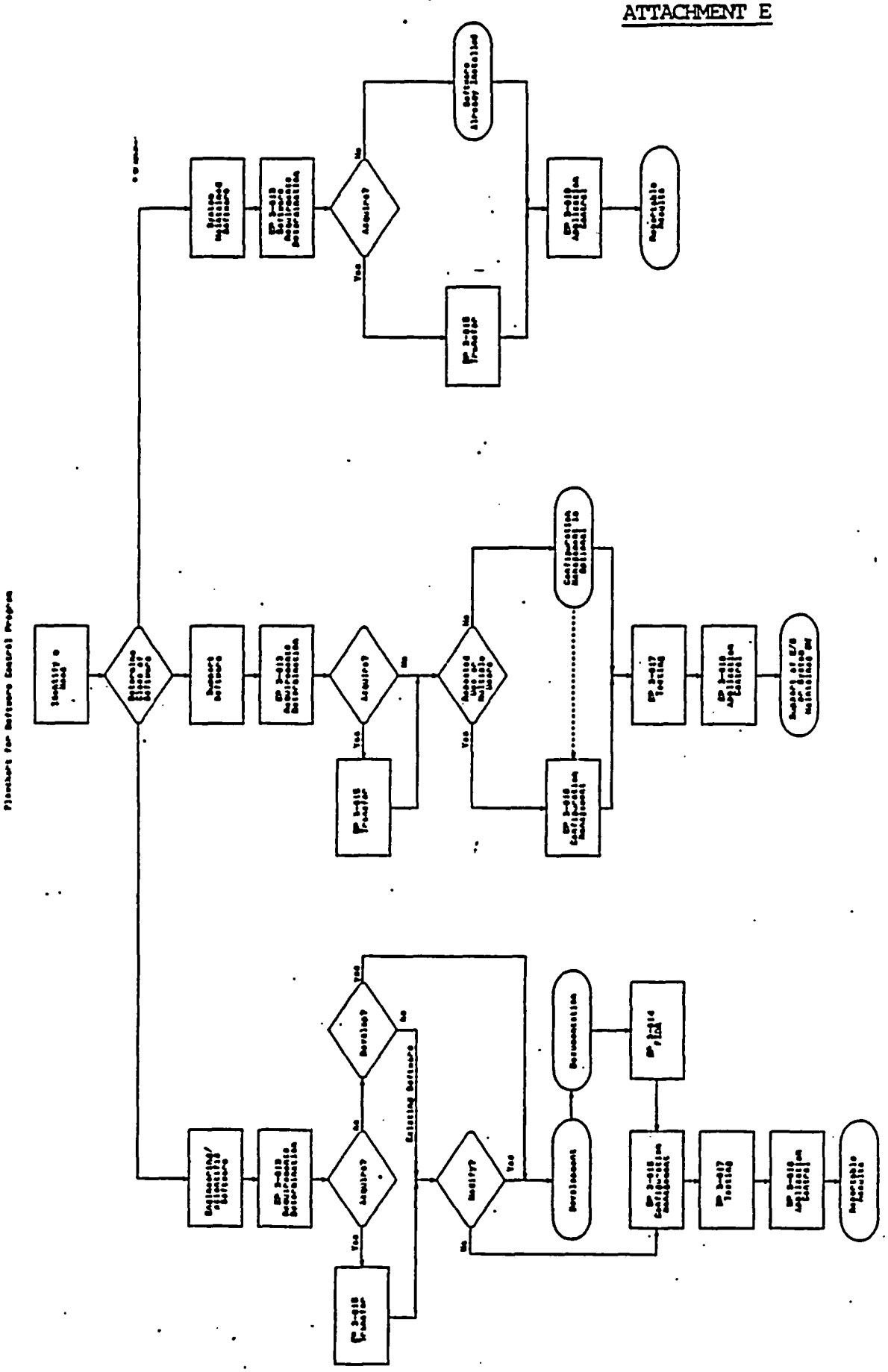
SECTION IV: Approvals of Answer to Question 1-9

10) Prepared by:

_____
Signature Date

ATTACHMENT D (CONTINUED)

System Maintained Software



ATTACHMENT E