

Documentation for the FRAMEwork Development Environment

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With Contributions From

B. L. Hoopes
M. A. Pelton
K. J. Castleton
G. M. Gelston
G. Whelan
R. Y. Taira

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Documentation for the FRAMEwork Development Environment

Introduction

This documentation provides information on a component of Version 2.x of the FRAMEwork System (FRAMES), which is a software platform that allows for the linking of various modules into complete assessment systems ([Whelan et al. 1997](#) PNNL-11748). Documentation includes requirements, design and specifications or formulations, and quality assurance and testing.

Portions of this documentation may have been previously issued in reports from the Pacific Northwest National Laboratory (PNNL), operated by Battelle for the U.S. Department of Energy. All PNNL reports are issued a tracking number. Numbers on the title page of this documentation indicate these previous reports.

This documentation can be used by software engineers and testers to ensure that each component functions properly. The information can also be used by analysts and managers to better understand the component's use within FRAMES.



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Documentation for the FRAMEwork Development Environment

General Requirements of FRAMES

The FRAMEwork Systems (FRAMES) includes a suite of editors designed to manage, view, and set up the underlying infrastructure as well as run a simulation. The five editors, each with its own documentation, include the following:

- [Conversion Editor](#), which manages measures and units used by dictionaries and datasets to automatically convert between different mediums
- [Dictionary Editor](#), which creates and edits dictionaries used by FRAMES to categorize data
- [Module Editor](#), which creates and manages the modules that manipulate data by specifying dictionaries
- [Domain Editor](#), which organizes a palette of modules from which to select for a particular simulation
- [Simulation Editor](#), which sets up and runs a particular simulation.

In addition, FRAMES includes a Linkage Server, which allows the user to connect to a web page to receive recent updates to the system and its components.

This section summarizes general requirements for FRAMES 2.0. Those interested in setting up a risk scenario and analyzing data should refer to the start up documentation for additional information. Those interested in importing a module into FRAMES should refer to the importation documentation for additional information.

FRAMES has the following overall requirements:

- G1 - operate using the 2.0 Application Programming Interface (API) under Windows 2000 or higher
- G2 - provide a security protocol to allow the user to publish updated system files to the Linkage Server
- G3 - provide access to the Linkage Server to retrieve and/or post the most current conversion, dictionary, and module files
- G4 - provide access via the Linkage Server to the status of the conversion, dictionary, and module files available.

The following sections describe the input and output requirements for FRAMES.

Input Requirements of FRAMES

FRAMES has the following general input requirements:

- I1 - generate module and dictionary files maintained within the Startup.INI file, which must be stored in the same directory as FRAMES. Note that the Startup.INI file cannot be copied from one system to another without using the installation program.
- I2 - register the SystemIO.dll. Note that while this must be registered with the operating system, it does not have to be in a local directory. [NOT IN TEST PLAN]
- I3 - include in the same directory the files Module.Dic, Startup.Dic, and Simulation.Dic. [NOT IN TEST PLAN]

Output Requirements of FRAMES

FRAMES has the following general output requirements:

- O1 - update a Startup.INI file that keeps track of all required files and domain property information
- O2 - store all information about a dictionary in an ASCII file with a .DIC file extension [NOT IN TEST PLAN]
- O3 - store all information about a module in an ASCII file with a .mod file extension [NOT IN TEST PLAN]
- O4 - provide a default Linkage Server for connection through a web page while allowing for the possibility of connecting to a user-defined Linkage Server [NOT IN TEST PLAN]
- O5 - allow the user to publish a conversion file to the Linkage Server
- O6 - allow the user to publish a dictionary file to the Linkage Server
- O7 - allow the user to publish a module to the Linkage Server.



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Design of FRAMES

The FRAMEwork System (FRAMES) includes a suite of editors designed to manage, view, and set up its underlying infrastructure on a single system as well as run a simulation. A full description of the design parameters can be found in [Whelan et al. 2002](#) (PNWD-3145). Related design information on the editors can be found in

- [Design of the Conversion Editor](#)
- [Design of the Dictionary Editor](#)
- [Design of the Module Editor](#)
- [Design of the Domain Editor](#)
- [Design of the Simulation Editor.](#)



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Quality Assurance and Testing of FRAMES

FRAMES was developed under a quality assurance (QA) program that looked at the software life cycle: requirements analysis, design, programming, modification, testing, and implementation. Quality is defined as the ability of the software to meet client needs. Meeting client needs starts with a shared understanding of how the software must perform and continues throughout the software life cycle through attention to details.

The program was designed to be compatible with similar processes used by our clients. For example, our QA process compares favorably with that in the U.S. Environmental Protection Agency Directive 2182, *System Design and Development Guidance* ([EPA 1997](#), EPA Directive 2182). It also compares favorably with the Office of Civilian Radioactive Waste Management's *Quality Assurance Requirements and Description, Supplement I, Software* ([OCRWM 1995](#)).

Part of the QA program involves testing each component to ensure that it satisfies its requirements. The [requirements](#) section of the FRAMES system documentation provides a list of general requirements for FRAMES. A test plan was developed with test cases that addressed these requirements. The following table shows how these requirements were addressed in testing.

Testing Matrix for FRAMES System Testing

[WAITING FOR CORRELATION BETWEEN TEST PLAN MATRIX AND TESTING REQUIREMENTS]

Requirement	Test Case			
---	1	2	3	4
1	-	-	-	-
2	Y	-	-	-
3	-	Y	-	-
4	-	Y	-	-
5	-	Y	-	-
6	-	Y	-	-
7	Y	-	-	-
8	Y	-	Y	Y
9	Y	-	Y	Y
10	-	-	Y	-
11	-	-	-	-
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-
17	-	-	-	-
18	Y	-	-	-

For additional information on the QA program, including testing, see the following documents:

- *An Approach to Ensuring Quality in Environmental Software* ([Gelston et al. 1998](#), PNNL-11880)

