DOE-EH-4.2.1.5- Design Codes Survey

Volume 2

Defense Nuclear Facilities Safety Board Recommendation 2002-1
Software Quality Assurance Implementation Plan

Safety-Related Design Software Survey and Recommendations

Volume II - Field Office and Contractor Inputs

Final Report

U.S. Department of Energy
Office of Environment, Safety and Health
1000 Independence Ave., S.W.
Washington, DC 20585-2040

February 2004

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FOREWORD

This document is a collection of inputs from Department of Energy Complex field office and contractors, in response to a safety related design software survey transmitted in September 2003. Together with the main report (Volume 1), this report (Volume II), meets Commitment 4.2.1.5 to the *Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2002-1*. Included are responses from seventeen contractors at nearly all the major Department of Energy sites and laboratories.

Suggestions for corrections or improvements to this document should be addressed to –

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REVISION STATUS

Page/Section	Revision	Change
1. Entire Document	1. Interim Report	1. Original Issue
2. Pages	2. Final Report	2. Added reports from ORNL, Miamisburg Closure Project, and INEEL.

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Safety-Related Design Software Survey and Recommendations
Volume II - Field Office and Contractor Inputs

EXECUTIVE SUMMARY

A series of actions that address Software Quality Assurance issues identified in Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2002-1, *Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities*, are documented in the Department of Energy (DOE) Implementation Plan (IP) for DNFSB Recommendation 2002-1. The IP includes a commitment (4.2.1.5) to conduct a survey of design software currently in use to determine if any should be included as part of the toolbox codes.

A safety design software survey was completed per IP Commitment 4.2.1.5. The main report to this document, Volume I, summarizes inputs received from DOE field offices and DOE safety contractors, and recommends a path forward to address issues of additional design software placement in the Central Registry. The current document, Volume II, contains all design software responses as received by the DOE Office of Quality Assurance through February 27, 2004.

Information contained in an individual response is presented in its entirety, with the exception of extraneous material (e.g., cover notes, facsimile pages or electronic mail pages, etc.). Discussions of code use and software quality assurance programs, procedures, and practices are reproduced as received from the field. However, full Quality Assurance Plans where provided by a contractor, are not shown. In other cases, the editors chose to reconfigure inputs to improve the readability of the information.

The information contained herein is in two major sections. First, the *Survey of Safety Software Used in Design of Structures, Systems, and Component*s that was transmitted on September 12, 2003, is shown (pages 1-6). Secondly, the inputs from the field offices and the safety contractors follow (pages 7-257).

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Survey of Safety Software
Used in Design of Structures, Systems, and Components

1. Introduction

The Department's Implementation Plan for Software Quality Assurance (SQA) that was developed in response to Defense Nuclear Facilities Safety Board Recommendation 2002-01, *Quality Assurance for Safety-Related Software*, includes a commitment (4.2.1.5) to conduct a survey of design codes currently in use to determine if any should be included as part of the toolbox codes. The toolbox codes are a small number of standard computer models (codes) supporting DOE safety analysis that have widespread use and appropriate qualification. Generally, the toolbox codes will have been developed and maintained within the DOE complex. However, the toolbox may also include commercial proprietary design codes where additional software quality assurance controls are appropriate.

The scope of the survey required by commitment 4.2.1.5 includes the identification of safety software currently use to support the analysis and design of defense nuclear facilities including structures, systems and components, as well electrical and control system design. Both commercial off-the-shelf software and DOE/contractor developed software should be included in the survey. Often the same software is used for both safety and non-safety, and nuclear and non-nuclear facility design. Therefore, care should be taken in identifying the safety software.

DOE field elements, including contractors and sub-contractors, as appropriate, should provide the information in the attached survey forms. The Office of Environment, Safety and Health (EH) will review the information submitted through this survey and determine if additional safety software should be included as toolbox codes.

In addition to the safety software information requested in this survey, EH would also like to receive information regarding your organization's SQA programs, procedures and training. This information should be entered in Section 5 of the survey form. This information will assist EH in the preparation of DOE SQA directives, which are also an Implementation Plan deliverable. However, this Section 5 of the survey form is optional.

Please submit completed survey information to Chip Lagdon, EH-31, using the design software survey email address **sqa@eh.doe.gov** by **October 31, 2003**.

2. Survey Information Prepared By

Name(s): _____

Organization(s): _____

Site or Laboratory: _____

Address: _____

Phone/email/facsimile: _____

_____

Principal DOE organization(s) supported (NNSA, EM) _____

Date Survey Form Submitted: _____

3. Design Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Attach additional sheets if needed.

1.1.1 Area of Applicability	**1.1.2 Computer Software Name***
Civil/Structural/Geotechnical Systems	
Mechanical Systems	
HVAC	
Electrical Systems	
Fire Protection Systems	
Instrumentation and Control	
Others (not included above)	

*** Enter "None" if no safety software is applicable to the area.**

4. Safety Software Information

For each safety software application identified in Section 3, provide the information requested below. Attachment 1 is provided as an example. For additional assistance, email questions to sqa@eh.doe.gov.

a.	**Code name and version**	
b.	**Function of code**	
c.	Application (what projects/facilities at the site/lab)	
d.	Code developer and/or sponsor	
e.	Commercial, Proprietary or Other (Explain)	
f.	Current Owner/Vendor and technical support provider	
g.	Documentation available	
h.	Code platform (Workstation, PC-based, Mainframe)	
i.	Operating System (Windows, DOS, other)	
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	
k.	How are error and user questions reported?	
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

5. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software?_____

Document title(s) and report number(s): _____
_____
_____
_____

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	Standard/Rule/DOE or Other Directive
	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
	d. DOE Order 414.1, *Quality Assurance*
	e. DOE Order 420.1, *Facility Safety*
	f. DOE Order 200.1, *Information Management Program*
	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
	h. DOE Guide 414.1-1, Assessment Guide for QA
	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify)

5.3 How do you apply QA procedures to safety software? _____
_____

5.4 How do you train users on safety software? _____
_____
_____
_____

1.2 Attachment 1. EXAMPLE OF SAFETY SOFTWARE INFORMATION

The following input is provided to guide survey respondents on the level of detail for completing the Section 4 survey information

a.	**Code name and version**	*STRUCTUREcode; Version 2003.1*
b.	**Function of code**	STRUCTRUEcode is used in the structural analysis and design of nuclear facilities and related structures.
c.	Application (what projects/facilities at the site/lab)	The software has been used in the analysis of many Hazard Category 2 and 3 facilities at the Site. It was used in the design of Facility A, and the upgrades to Facility B.
d.	Code developer and/or sponsor	XYZ Structural Safety Associates, Address: Email: Phone:
e.	Commercial, Proprietary or Other (Explain)	P; Site-license
f.	Current Owner/Vendor and technical support provider	Same as (d.) above; Technical Support is included and is part of Site license fee.
g.	Documentation available	1. User's Manual 2. Software Model Description 3. Software Requirements Specification 4. Test Problems- Input and Output files
h.	Code platform (Workstation, PC-based, Mainframe)	The software runs on a PC-based platform.
i.	Operating System (Windows, DOS, other)	WINDOWS-NT, -XP; -2000 are supported.
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	The vendor reports updates and sends out error notices via email. A website exists for reporting software problems and posing questions on use of the code. Response is within 24 hours of the request.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	STRUCTUREcode requires a formal training class (given by vendor) and completion of several test studies before a user is qualified. Most users are structural engineers at the BS level. Documentation is upgraded with each version update. Experience with this software has been good and relatively few (minor) errors have been identified in five years of use.

Department of Energy/Office of Environmental Management

Hanford

Bechtel National, Inc.

Survey Information Prepared By:

Name: Carlos Villalpando
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-2782
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	AGI32 version 1.64
Function of code	System Design Lighting Analysis
*Area of applicability - see above	Electrical Systems
Application (what projects/facilities at the site/lab)	Across all facilities
Code developer and/or sponsor	*Lighting Analysts, Inc.*
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Bechtel National, Inc. / *Lighting Analysts, Inc.* is the vendor/tech support
Documentation available	Yes - Manuals in acrobat format & online documentation
Code Platform (Workstation, PC-based, Mainframe)	PC workstations
Operating System (Windows #, DOS, Other)	Windows NT 4.0, Windows 2000, Windows XP
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine usage
How are error and user questions reported?	Error notification is handled according to procedure 24590-WTP-GPP-IT-001, *Use of Quality Affecting Software Applications* and can be obtained through Project Archives and Document Controls. User questions are handled internally, or by *Lighting Analysts, Inc.* technical support.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	AGI32 is a state of the art illumination engineering program. It will run satisfactorily on the Minimum required hardware for relatively simple applications. Users planning on taking advantage of the full

	spectrum of power offered by AGI32 should consider the Recommended hardware requirements (see next page). AGI32 provides a software tool used to predict the lighting performance of selected luminaires in a simulated environment. The environments that may be considered in AGI32 can range from a simple rectangular space to a multilevel interchange or complex auditorium. AGI32 is a stand-alone tool, meaning that other software is not required to create or output the calculations results. Software errors are reported in accordance to procedure 24590-WTP-GPP-IT-001, *Use of Quality Affecting Software Applications*. No errors have been reported at this time.
Design and analysis work being performed using this application	See above. Lighting Calculations for the illuminated areas of all facilities.

Survey Information Prepared By:

Name: Tim Milot
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 509-371-4542 / tsmilot@bechtel.com /
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	ANSYS
Function of code	Finite Element mechanical Analysis of equipment
*Area of applicability - see above	Structural, Mechanical systems
Application (what projects/facilities at the site/lab)	pressure vessels, equipment
Code developer and/or sponsor	ANSYS Inc
Commercial, Proprietary, or Other (explain)	Commercial off the shelf
Current Owner/Vendor and technical support provider	JLR ANSYS
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	Workstation
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Software error notices
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	ANSYS is industry standard Finite Element Analysis software, which is very thoroughly documented and supported by the vendor
Design and analysis work being performed using this application	preliminary sizing of pressure vessels, stress and thermal analysis of equipment

Survey Information Prepared By:

Name: Snehal Shah
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Phone/email/facsimile: 509-371-4540 / ssshah@bechtel.com /
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the preliminary design of safety class and safety significant structures, systems, and components in the following areas: Mechanical Systems
Note: This software is not used for final design of any component regardless of safety classification.

For each safety software application identified:

Code/application name and version	Aspen - BJAC 11.1
Function of code	Mechanical design of shell and tube heat exchangers
*Area of applicability - see above	Mechanical systems
Application (what projects/facilities at the site/lab)	heat exchangers for PTF, HLW, LAW, BOF, LAB
Code developer and/or sponsor	Aspen Technology Inc.
Commercial, Proprietary, or Other (explain)	Commercial off the shelf
Current Owner/Vendor and technical support provider	Aspen Technology Inc.
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-based, Workstation
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Software error notices
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Aspen-BJAC is widely used software for mechanical design of shell and tube heat exchanger, which is very thoroughly documented and supported by the vendor
Design and analysis work being performed using this application	Preliminary mechanical design of shell and tube type heat exchangers to support Material Requisition for quotes and to verify the vendor design. This is **not** used for final design of any shell and tube heat exchanger.

Survey Information Prepared By:

Name: Ivan Papp
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-3605/igpapp@bechtel.com/371-3507
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	WTP Engineering Baseline Process Performance Software, Version 1.0
Function of code	To provide stream data to support design and Commissioning and Testing of WTP (Waste Treatment Plant) facility.
*Area of applicability - see above	O
Application (what projects/facilities at the site/lab)	• Design input for design calculations (PT, LAW Vit, HLW Vit, Lab) • Forecasts performance of various feed streams to the WTP and effluent streams to LERF/ETF • Represents the design performance capability during cold and hot commissioning
Code developer and/or sponsor	Sponsor: Ivan Papp
Commercial, Proprietary, or Other (explain)	O The routine was produced by the Process Engineering Department using fundamental engineering and chemistry equations. The Quality Affecting Software (QAS) routine was developed using Microsoft® Excel 2000.
Current Owner/Vendor and technical support provider	Central Process Engineering/Central Process Engineering
Documentation available	24590-WTP-VV-ENG-03-005, Rev. 0.
Code Platform (Workstation, PC-based, Mainframe)	Workstation

Operating System (Windows #, DOS, Other)	Windows 2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Error identification and notification is per procedure 24590-WTP-GPP-IT-001 (Use of Quality Affecting Software Application). User questions are reported to the Project Program Sponsor (Ivan Papp).
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	It is a Microsoft® Excel based model where all the inputs into the routine are listed in Appendix C of 24590-WTP-VV-ENG-03-005. A desktop instruction on using the routine is available from Ivan Papp or Dale Obenauer.
Design and analysis work being performed using this application	• Estimated Hydrogen Generation Rates for Pretreatment and HLW Calculation • Memo reporting stream data for AY-102 and AP-101

Survey Information Prepared By:

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Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **415-768-3734**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	CE980 (BSIMQKE), 1984, version B1-4PC
Function of code	Generation of spectrum-compatible time histories
*Area of applicability - see above	C
Application (what projects/facilities at the site/lab)	All Seismic Category I WTP buildings
Code developer and/or sponsor	Bechtel
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Bechtel
Documentation available	Computer Service Library of Bechtel Corp. in San Francisco, California
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows 95/98/2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	O
How are error and user questions reported?	Report to technical specialist or the Computer Service Library of Bechtel Corp. in San Francisco, California
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Specialized program needs experienced user
Design and analysis work being performed using this application	Generation of spectrum-compatible time histories

Survey Information Prepared By:

Name: Tim Milot
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
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Phone/email/facsimile: 509-371-4542 / tsmilot@bechtel.com /
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Compress Codeware is an ASME VIII pressure vessel calculation program used for preliminary sizing of pressure vessels and nozzles. Compress is not used for final design.

For each safety software application identified:

Code/application name and version	Compress 6.187/6.214
Function of code	Pressure vessel sizing software
*Area of applicability - see above	Structural, Mechanical systems
Application (what projects/facilities at the site/lab)	pressure vessels
Code developer and/or sponsor	Codeware
Commercial, Proprietary, or Other (explain)	Commercial off the shelf
Current Owner/Vendor and technical support provider	Codeware
Documentation available	PDF manual
Code Platform (Workstation, PC-based, Mainframe)	Workstation
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Software error notices are reported per procedure 24590-WTP-3DP-G04B-00038 rev 1. User questions are directed to PPS and Codeware technical support.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Compress is straightforward to use and user friendly. It is only applicable to pressure vessels, not tanks. Manuals are updated with version revisions and are in PDF format.
Design and analysis work being performed using this application	Preliminary sizing of pressure vessels. Compress Codeware is not used for final design.

Survey Information Prepared By:

Name: Sean G. Smith
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371-8179 / sgsmith2@bechtel.com / (509) 371-8172
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Control Valve Sizing - Gas Service, Version 1.1
Function of code	Calculate Valve Sizing
*Area of applicability - see above	Instrumentation and Control (I&C) Mechanical Systems
Application (what projects/facilities at the site/lab)	WTP RPP Project for the LAW, PTF, HLW, BOF, and other facilities as needed on the project.
Code developer and/or sponsor	Calvin Lasley (PPS)
Commercial, Proprietary, or Other (explain)	Other. The routine was generated by I&C Central Engineering on the WTP RPP project.
Current Owner/Vendor and technical support provider	Calvin Lasley (PPS)
Documentation available	• 24590-WTP-VV-ENG-03-002, Control Valve Sizing for Gas Service - QAS Routine • 24590-WTP-GPG-J-016, Design Guide Control Valve Sizing
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	Windows 2000 Service Pack 3 Windows NT 6 SP6a
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine
How are error and user questions reported?	All errors will be reported to the PPS and processed in accordance with 24590-WTP-GPP-IT-001. All questions are also directed to the PPS.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	I&C have generated a significant amount of calculations with this routine and have not experienced any technical errors or issues.

Design and analysis work being performed using this application	Design work being performed involves I&C generating a valve size calculation based upon committed process data from Mechanical Systems. Once the sizing is completed and the calculation released, the HOLDS are removed from the P&ID's and Plant Design can model accordingly.

Survey Information Prepared By:

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Phone/email/facsimile: (509) 371-8179 / sgsmith2@bechtel.com / (509) 371-8172
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Control Valve Sizing - Liquid Service, Version 1.1
Function of code	Calculate Valve Sizing
*Area of applicability - see above	Instrumentation and Control (I&C) Mechanical Systems
Application (what projects/facilities at the site/lab)	WTP RPP Project for the LAW, PTF, HLW, BOF, and other facilities as needed on the project.
Code developer and/or sponsor	Calvin Lasley (PPS)
Commercial, Proprietary, or Other (explain)	Other. The routine was generated by I&C Central Engineering on the WTP RPP project.
Current Owner/Vendor and technical support provider	Calvin Lasley (PPS)
Documentation available	• 24590-WTP-VV-ENG-03-001, Control Valve Sizing for Liquid Service - QAS Routine • 24590-WTP-GPG-J-016, Design Guide Control Valve Sizing
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	Windows 2000 Service Pack 3 Windows NT 6 SP6a
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine
How are error and user questions reported?	All errors will be reported to the PPS and processed in accordance with 24590-WTP-GPP-IT-001. All questions are also directed to the PPS.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	I&C have generated a significant amount of calculations with this routine and have not experienced any technical errors or issues.

Design and analysis work being performed using this application	Design work being performed involves I&C generating a valve size calculation based upon committed process data from Mechanical Systems. Once the sizing is completed and the calculation released, the HOLDS are removed from the P&ID's and Plant Design can model accordingly.

Survey Information Prepared By:

Name: Sean G. Smith
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371-8179 / sgsmith2@bechtel.com / (509) 371-8172
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Control Valve Sizing - Steam Service, Version 1.1
Function of code	Calculate Valve Sizing
*Area of applicability - see above	Instrumentation and Control (I&C) Mechanical Systems
Application (what projects/facilities at the site/lab)	WTP RPP Project for the LAW, PTF, HLW, BOF, and other facilities as needed on the project.
Code developer and/or sponsor	Calvin Lasley (PPS)
Commercial, Proprietary, or Other (explain)	Other. The routine was generated by I&C Central Engineering on the WTP RPP project.
Current Owner/Vendor and technical support provider	Calvin Lasley (PPS)
Documentation available	• 24590-WTP-VV-ENG-03-003, Control Valve Sizing for Steam Service - QAS Routine • 24590-WTP-GPG-J-016, Design Guide Control Valve Sizing
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	Windows 2000 Service Pack 3 Windows NT 6 SP6a
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine
How are error and user questions reported?	All errors will be reported to the PPS and processed in accordance with 24590-WTP-GPP-IT-001. All questions are also directed to the PPS.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	I&C have generated a significant amount of calculations with this routine and have not experienced any technical errors or issues.

Design and analysis work being performed using this application	Design work being performed involves I&C generating a valve size calculation based upon committed process data from Mechanical Systems. Once the sizing is completed and the calculation released, the HOLDS are removed from the P&ID's and Plant Design can model accordingly.

Survey Information Prepared By:

Name: Amir Hamaoui
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Phone/email/facsimile: (415) 768-5516 / ahamaoui@bechtel.com / (415) 768-5512
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	DAPSS 1.0
Function of code	Process Tool
*Area of applicability - see above	Piping
Application (what projects/facilities at the site/lab)	PTF, HLW
Code developer and/or sponsor	Amir Hamaoui
Commercial, Proprietary, or Other (explain)	Developed
Current Owner/Vendor and technical support provider	Amir Hamaoui
Documentation available	Non-QAS documentation
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Email to PPS
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Increases efficiency and quality.
Design and analysis work being performed using this application	Pipe Support Calculation Qualification Report

Survey Information Prepared By:

Name: **Farhang Ostadan**
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **415-768-3734**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	CE928 (DATAN), 1991, version C1-4PC
Function of code	Probabilistic data analysis
*Area of applicability - see above	C
Application (what projects/facilities at the site/lab)	All Seismic Category I WTP buildings
Code developer and/or sponsor	Bechtel
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Bechtel
Documentation available	Computer Service Library of Bechtel Corp. in San Francisco, California
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows 95/98/2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	O
How are error and user questions reported?	Report to technical specialist or the Computer Service Library of Bechtel Corp. in San Francisco, California
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Specialized program needs experienced user
Design and analysis work being performed using this application	Probabilistic data analysis of ground motions

Survey Information Prepared By:

Name: Carlos Villalpando
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-2782
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	ETAP POWERSTATION 4.7.0
Function of code	Electrical Power System Analysis
*Area of applicability - see above	Electrical Systems
Application (what projects/facilities at the site/lab)	Across all facilities
Code developer and/or sponsor	OTI.
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Bechtel National, Inc. / OTI is the vendor/tech support
Documentation available	Yes - Manuals & online documentation
Code Platform (Workstation, PC-based, Mainframe)	PC workstations
Operating System (Windows #, DOS, Other)	Windows NT 4.0, Windows 2000, Windows Millennium, Windows XP
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine usage
How are error and user questions reported?	Error notification is handled according to procedure 24590-WTP-GPP-IT-001, *Use of Quality Affecting Software Applications* and can be obtained through Project Archives and Document Controls. User questions are handled internally, or by OTI technical support.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	ETAP PowerStation is a fully graphical power systems analysis program that runs on Microsoft® Windows® 98, NT 4.0, 2000, Me, and XP environments. ETAP PowerStation is used to

	analyze complex power distribution networks requiring intensive computation. The software has been in use from the beginning of the project. There have been software errors reported in accordance to procedure 24590-WTP-GPP-IT-001, *Use of Quality Affecting Software Applications*. These errors have not affected project calculations. All the recorded errors have been documented and can be obtained through Project Archives and Document Controls.
Design and analysis work being performed using this application	See above. Electrical system analysis work such as short circuit, load flow, cable pull, and grounding calculations as required.

Survey Information Prepared By:

Name: Sean G. Smith
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Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	FLOWEL, Version 3.0g
Function of code	Calculate Orifice Plate Size(s)
*Area of applicability - see above	Instrumentation and Control (I&C)
Application (what projects/facilities at the site/lab)	WTP RPP Project for the LAW, PTF, HLW, BOF, and other facilities as needed on the project.
Code developer and/or sponsor	Kenonic Controls LTD Sean G. Smith (PPS)
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Kenonic Controls LTD
Documentation available	• 24590-WTP-PL-IN-03-001, Project Plan for FLOWEL • 24590-WTP-RPT-ENG-03-016, FLOWEL Software Requirements Specification • 24590-WTP-PL-ENG-03-016, FLOWEL V&V Plan • 24590-WTP-VV-HS-03-002, Verification and Validation Report for FLOWEL • FLOWEL 3.0 for Windows, Revision G, July 1999, Kenonic Controls Ltd. • FLOWEL 3.0 Equations Validation Vol. 1, 2, 3, February 1995, Kenonic Controls Ltd.
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows NT 6 SP6a

Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	All errors will be reported to the PPS and processed in accordance with 24590-WTP-GPP-IT-001. All questions are also directed to the PPS.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	I&C have generated calculations with this routine and have not experienced any technical errors or issues.
Design and analysis work being performed using this application	Design work being performed involves I&C generating an orifice size calculation based upon committed process data from Mechanical Systems.

Survey Information Prepared By:

Name: Jon Berkoe
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 415-768-2149; jberkoe@bechtel.com; 415-768-1794
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Fluent - Version 6.1.18
Function of code	Computational Fluid Dynamics
*Area of applicability - see above	HVAC, Mechanical Systems
Application (what projects/facilities at the site/lab)	HLW, LAW, and Pre-Treatment Buildings –Mixing Vessels, Pour Caves, Canisters
Code developer and/or sponsor	Fluent, Inc. (Lebanon, NH)
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Fluent, Inc. (Lebanon, NH)
Documentation available	Yes - CDROM
Code Platform (Workstation, PC-based, Mainframe)	Workstation and PC
Operating System (Windows #, DOS, Other)	Linux, Windows 2000, Unix
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Documentation or email replies sent from vendor to PPS; PPS to notify users of significant errors
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Very robust and industry-tested software. User-friendly Graphical user interface. Excellent CDROM documentation. Errors reported and resolved effectively.
Design and analysis work being performed using this application	CFD analysis of pulsed jet mixing systems for Newtonian and non-newtonian vessels; CFD analysis for LAW/HLW pour cave HVAC design and structural heat transfer.

Survey Information Prepared By:

Name: Ronald Graves
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
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Phone/email/facsimile:
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Fluent 6.1.18
Function of code	Computational Fluid Dynamics
*Area of applicability - see above	Mechanical Systems
Application (what projects/facilities at the site/lab)	Species transport and heat transfer in HLW waste tanks.
Code developer and/or sponsor	Jon Berkoe
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Fluent, Inc.
Documentation available	Document is online at www.fluent.com and on CD Rom
Code Platform (Workstation, PC-based, Mainframe)	PC (Compaq W6000)
Operating System (Windows #, DOS, Other)	Windows 2000, SP3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Repeated use, code of choice
How are error and user questions reported?	Fluent technical support/PPS
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Running the code requires training and knowledge in physics and fluid dynamics.
Design and analysis work being performed using this application	The Bechtel SF group is using the code for a number of WTP projects. E&NS is using the code for safety analysis work.

Survey Information Prepared By:

Name: **Sam Ramesh**
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **509-371-5425**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	GTSTRUDL Version 25
Function of code	Structural and Finite Element Analysis - Concrete and Steel Design
*Area of applicability - see above	C
Application (what projects/facilities at the site/lab)	All major WTP buildings and structures
Code developer and/or sponsor	Georgia Tech University
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Georgia Tech University
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	Workstation installation, License off wtps0050 server
Operating System (Windows #, DOS, Other)	Windows 2000 Service Pack 3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Errors are reported to Computer Service Library in San Francisco. The Computer Service Library forwards the Error Notices to the PPS. User Questions are reported to the to the PPS.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Comprehensive program for analysis and design of structures. Known errors are distributed to users through SENs.
Design and analysis work being performed using this application	Structural and Finite Element Analysis - Concrete and Steel Design

Survey Information Prepared By:

Name: Charles W. McKnight
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Phone/email/facsimile: (509)371-3145/cwmcknig@bechtel.com/(509)371-3508
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	HASS 7.5
Function of code	Hydraulic analysis of automatic fire protection sprinkler systems
*Area of applicability - see above	Fire Protection
Application (what projects/facilities at the site/lab)	Hydraulic analysis of automatic fire protection sprinkler systems
Code developer and/or sponsor	N/A
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Bechtel National Inc/ Haestad Methods Inc.
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-Based and Workstation
Operating System (Windows #, DOS, Other)	Windows NT, 2000, XP
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Via phone or email
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	This software is very easy to use and does an excellent job of modeling fire protection sprinkler systems. There are no known errors or issues at this time.
Design and analysis work being performed using this application	This software is being used to verify fire sprinkler designs supplied by subcontractors.

Survey Information Prepared By:

Name: Scott Rossell
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: Phone: (509) 371-3843, e-mail: srossell@bechtel.com, fax: (509) 371-3507
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	HSC Chemistry 4.1
Function of code	Chemical Reaction Equilibrium Software with Thermodynamic Database
*Area of applicability - see above	Other
Application (what projects/facilities at the site/lab)	Used to define enthalpies for certain compounds
Code developer and/or sponsor	Outokumpu Research Oy
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	developer: mailto:hsc@outokumpu.com vendor: http://www.esm-software.com/ or http://www.chemsw.com/
Documentation available	Users have a manual
Code Platform (Workstation, PC-based, Mainframe)	Workstation
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	O
How are error and user questions reported?	Users can refer to the manual, other users or the PPS for questions. The procedure for error reporting is documented in: 24590-WTP-3DP-G04B-00038.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	• It is useful as a quick reference for thermodynamic information • The documentation does a good job of explaining the features and giving examples. • Upgrade information is posted on the website: http://www.outokumpu.com/hsc

Design and analysis work being performed using this application	Temperature Enthalpy data was extracted from the database for several minor compounds. The majority of the enthalpy information in the mass balance was taken from *Thermochemical Data of Pure Substances* by Barin. However, for completeness temperature enthalpy data was extracted from the HSC database for several minor components that were not found in the Barin reference.

Survey Information Prepared By:

Name: Snehal Shah
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
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Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the preliminary sizing of safety class and safety significant structures, systems, and components in the following areas: Mechanical Systems
Note: This software is not used for final design of any component regardless of safety classification.

For each safety software application identified:

Code/application name and version	HTRI (IST 2.0)
Function of code	Thermal design/rating of shell and tube heat exchangers
*Area of applicability - see above	Mechanical systems
Application (what projects/facilities at the site/lab)	heat exchangers for PTF, HLW, LAW, BOF, LAB
Code developer and/or sponsor	HTRI Inc.
Commercial, Proprietary, or Other (explain)	Commercial off the shelf
Current Owner/Vendor and technical support provider	HTRI Inc.
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-based, Workstation
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Software error notices
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	HTRI (IST 2.0) is widely used software for thermal design of shell and tube heat exchanger design and rating, which is very thoroughly documented and supported by the vendor
Design and analysis work being performed using this application	Preliminary sizing of shell and tube type heat exchangers to support Material Requisition for quotes and to verify the vendor design. This is **not** used for final design of any shell and tube heat exchanger.

Survey Information Prepared By:

Name: Snehal Shah
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Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 509-371-4540 / ssshah@bechtel.com /
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
This program is not used on WTP/RPP project, this program is part of HTRI package.
Note: This software is not used for final design of any component regardless of safety classification.

For each safety software application identified:

Code/application name and version	HTRI (PHE 2.0)
Function of code	Design/rating of plate and frame heat exchangers
*Area of applicability - see above	None
Application (what projects/facilities at the site/lab)	N/A
Code developer and/or sponsor	HTRI Inc.
Commercial, Proprietary, or Other (explain)	Commercial off the shelf
Current Owner/Vendor and technical support provider	HTRI Inc.
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-based, Workstation
Operating System (Windows #, DOS, Other)	DOS
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	N/A
How are error and user questions reported?	N/A
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Not used
Design and analysis work being performed using this application	Not used

Survey Information Prepared By:

Name: Stephen Troilett
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371 3710 sptroile@bechtel.com
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Delmia Envision Version D5R12 (IGRIP)
Function of code	Look at overall design of Remotely operated plant and equipment
*Area of applicability - see above	O
Application (what projects/facilities at the site/lab)	RPP-WTP. High Level Waste Treatment Plant, Pre Treatment Facility, Low Active Waste and Laboratories
Code developer and/or sponsor	PPS / Stephen Troilett
Commercial, Proprietary, or Other (explain)	C
Current Owner/Vendor and technical support provider	WTP / Delmia and Delmia
Documentation available	Delmia Online Documentation
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows 2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine
How are error and user questions reported?	Directly to Delmia support services, either via e-mail or over the phone.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	IGRIP is a 3 Dimensional software which is a very good tool for viewing plant and equipment in a virtual world.
Design and analysis work being performed using this application	Envision provides a virtual model for looking at the overall design and functionality of complete systems. Taking into account equipment dynamic movement and reach, system cycle times, overall equipment

	layout, equipment functionality and maintainability, remote viewing from cameras and shield windows.

Survey Information Prepared By:

Name: Mary Hull
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 509-371-3739
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Mathcad 11, Roark's and Civil Engineering Library
Function of code	Application used to complete calculations
*Area of applicability - see above	ALL
Application (what projects/facilities at the site/lab)	ALL
Code developer and/or sponsor	PPS - Mary Hull
Commercial, Proprietary, or Other (explain)	C
Current Owner/Vendor and technical support provider	Mathsoft
Documentation available	User Guide
Code Platform (Workstation, PC-based, Mainframe)	Concurrent License on server wtps0024, shared on workstations
Operating System (Windows #, DOS, Other)	Win2K service Pack 3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	To the PPS and then with SENs
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	MathCAD is a widely used software (comparable to Microsoft excel), it is easy to use because it displays calculations and output in a "book" like manner. Known errors, documentation, and templates are found off their website.
Design and analysis work being performed using this application	Every calculation for the WTP can be created using this software.

Survey Information Prepared By:

Name: **Ronald Graves**
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **509-371-3744**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Mathematica
Function of code	Mathematical tool
*Area of applicability - see above	Mechanical Systems, Safety Analysis
Application (what projects/facilities at the site/lab)	Used as a mathematical tool for WTP safety analysis.
Code developer and/or sponsor	Ronald Graves
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Wolfram Research.
Documentation available	Documentation is in a book, which came with the product. Help files are accessible when the program is running.
Code Platform (Workstation, PC-based, Mainframe)	PC (Compaq W6000)
Operating System (Windows #, DOS, Other)	Windows 2000, SP3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Repeated use, code of choice
How are error and user questions reported?	Wolfram Research
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Running the code requires training and knowledge in mathematics. Also, some features require Lisp programming knowledge.
Design and analysis work being performed using this application	The code is being used as a tool to solve safety analysis related problems.

Survey Information Prepared By:

Name: Steven M. Henry
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-3695/ smhenry@bechtel.com/ 371-3511
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	MCnP 4C
Function of code	Criticality and dose rate determination
*Area of applicability - see above	Criticality and shielding analysis
Application (what projects/facilities at the site/lab)	WTP
Code developer and/or sponsor	LANL
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	ORNL
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	DOS program but runs under windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Routine
How are error and user questions reported?	Software Error Notification Form
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	No problems`
Design and analysis work being performed using this application	Criticality and dose rate analysis

Survey Information Prepared By:

Name: Jack Shen
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
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Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	B31.3/ME101 Release N8
Function of code	Process Tool for pipe stress analysis
*Area of applicability - see above	M (Piping Systems)
Application (what projects/facilities at the site/lab)	RPP-WTP Project, all Facilities
Code developer and/or sponsor	Milton Dong
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Milton Dong/Mo Khlafallah
Documentation available	QAS Documentation
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows NT and Windows 2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	If an error is discovered, the user immediately notices the Project Program Sponsor (PPS). The PPS analyzes software application errors and classifies them. User notification of Class 1 errors is optional, at the PPS's discretion. User notification is required for Class 2 and Class 3 errors. After being informed of application errors, the PPS prepares a Software Error Notification and e-mail notification of the error to IT Change Manager. Upon receiving a software error notification from the PPS or IT Change manager, the user determines if past or present

	activities are impacted or affected by the error and take appropriate action to avoid use of results with the error present.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	ME101 performs both static and dynamic piping stress analyses. It includes the analyses of weight, thermal expansion, the combined weight load and thermal expansion with non-linear effect, thermal stratification, wind (UBC or ASCE standards), static seismic, uniform response spectrum method, the independent support motion, and water hammer with linear or non-linear elements. Harmonic analysis is available to evaluate steady-state vibrations. Bechtel's non-linear energy absorber may be used to reduce dynamic response. All load cases can be evaluated in a single computer run, and the results can be combined easily according to project criteria to generate support and hanger guidance and to perform stress checks. ME101 provides standard material property tables and a standard AISC table, and has code compliance checks for the ANSI B31 Codes, ASME Section III Codes, and the British Code. TheME101 input is simple and user-friendly. On Windows 95/NT platforms, a windows-based intuitive and easy-to-use GUI interface is provided through the ME101PRE module. State-of-the-art numerical techniques and analytical methods are incorporated to provide the best solutions with fast turnaround time. On Windows 95/NT platforms, all graphics can be exported to any Microsoft Office program such as Word. Either a simple linedraw mode or a more realistic solid model mode can be selected to view the system, and animation of mode shapes or deformation is available as well. Response from time history analysis can be plotted in the form of time history traces. Based on the staffing curve in Pipe Stress Group, we may need ME101 software licenses up to 15 – 20 copies to perform the piping stress analysis for this project.
Design and analysis work being performed using this application	Pipe stress analysis and code compliance

Survey Information Prepared By:

Name: Jack Shen
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (415) 768-2867 / jkshen@bechtel.com / (415) 768-5512
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Code: B31.3 Application name and version ME150 Version 19 ME152 Version 11 ME153 Version 11 ME149 Version 6 ME035 Version 16
Function of code	Process Tool for pipe support design
*Area of applicability - see above	M (Piping Systems)
Application (what projects/facilities at the site/lab)	RPP-WTP Project, all Facilities
Code developer and/or sponsor	Harendra Shah
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Harendra Shah /Mo Khlafallah
Documentation available	QAS Documentation
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows NT and Windows 2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	If an error is discovered, the user immediately notices the Project Program Sponsor (PPS). The PPS analyzes software application errors and classifies them. User notification of Class 1 errors is optional, at the PPS's discretion. User notification is required for Class 2 and Class 3 errors. After being informed

	of application errors, the PPS prepares a Software Error Notification and e-mail notification of the error to IT Change Manager. Upon receiving a software error notification from the PPS or IT Change manager, the user determines if past or present activities are impacted or affected by the error and take appropriate action to avoid use of results with the error present.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	ME150 is a suite of unique integrated computer programs for pipe support engineering work that increases productivity, consistency and quality while reducing engineering and construction cost. The family of programs effectively addresses technical, industry and documentation issues, and eliminates the time consuming manual calculation, expensive engineering judgment and "cookbook" approach, while reducing material and construction cost, and unnecessary repairs. The results provide the margin factors of various pipe support elements, thus assist in making sound engineering decisions in a timely fashion, and reduce the need for re-calculation. ME150 family of programs contains five PC-based computer programs. Together with Windows OpenGL graphic, this program provides us more power and versatility than the traditional mainframe systems. The Windows 95/NT version utilizes a graphical user interface to ease our work as we have expected from today's computer technology. ME150 family of programs has user's friendly interface, flexibility and simplicity, and provides consistency and integration.
Design and analysis work being performed using this application	Pipe support design and code compliance

Survey Information Prepared By:

Name: Steven M. Henry
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-3695/ smhenry@bechtel.com/ 371-3511
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Micro Shield 6.01
Function of code	Calculate Dose rate
*Area of applicability - see above	Shielding Analysis
Application (what projects/facilities at the site/lab)	WTP
Code developer and/or sponsor	Grove Engineering
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	BNI/Grove Engineering
Documentation available	Yes
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Software Error Notification Form
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	No problems
Design and analysis work being performed using this application	Shielding Analysis

Survey Information Prepared By:

Name: Sharok Khabir
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-3628/skhabir@bechtel.com
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability

Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Jet Impingement Code (NE155)
Function of code	Jet Impingement forces and zone
*Area of applicability - see above	Mechanical Systems
Application (what projects/facilities at the site/lab)	All
Code developer and/or sponsor	Bechtel
Commercial, Proprietary, or Other (explain)	None
Current Owner/Vendor and technical support provider	Bechtel
Documentation available	User Manual (on hand per Corporate procedure for SCP's.)
Code Platform (Workstation, PC-based, Mainframe)	PC - Based
Operating System (Windows #, DOS, Other)	Window/DOS
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	Errors are to be handled per Project procedures 24590-WTP-GPP-IT-001, *Use of Quality Affecting Software Applications*.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Working knowledge of heat transfer and fluid flow required. About 4 hours are required to familiarize a user with the code.
Design and analysis work being performed using this application	None at this time. Plans are to use the software for Hazard topography final implementation and completion.

Survey Information Prepared By:

Name: Tim Eichhorn
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371-3679/tpeichho@bechtel.com / (509) 371-3507
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Pipe-Flo Compressible Version 7.0
Function of code	Calculate flow parameters in compressible fluid flow piping networks.
*Area of applicability - see above	M
Application (what projects/facilities at the site/lab)	WTP Mechanical Systems Richland
Code developer and/or sponsor	PPS - Tim Eichhorn
Commercial, Proprietary, or Other (explain)	C
Current Owner/Vendor and technical support provider	WTP - Licensee Engineered Software Inc. - technical support provider
Documentation available	24590-WTP-RPT-M-02-002 Rev 2, Test Plan/Report for Pipe-Flo Compressible Version 7.0
Code Platform (Workstation, PC-based, Mainframe)	Windows NT Version 4.0 SP6A workstations: Compaq AP550, Deskpro EN, Evo D500, and AP400 Windows 2000 Version 5.0 SP3 workstations: Compaq Deskpro ENS, AP550, Evo D500, Evo D510, and W6000 Single Processor
Operating System (Windows #, DOS, Other)	Windows NT Version 4.0 SP6 and/or Windows 2000 Version 5.0 SP3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Errors are reported on screen at local workstation when the program hits an error/interrupt. Questions answered by consultation with another engineer,

	engineering automation, or vendor.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	None
Design and analysis work being performed using this application	Newtonian, compressible, fluid flow through piping systems.

Survey Information Prepared By:

Name: Tim Eichhorn
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371-3679/tpeichho@bechtel.com / (509) 371-3507
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	Pipe-Flo Professional Version 7.0
Function of code	Calculate non-compressible flow parameters in fluid flow piping networks.
*Area of applicability - see above	M
Application (what projects/facilities at the site/lab)	WTP Mechanical Systems Richland
Code developer and/or sponsor	PPS - Tim Eichhorn
Commercial, Proprietary, or Other (explain)	C
Current Owner/Vendor and technical support provider	WTP - Licensee Engineered Software Inc. - technical support provider
Documentation available	24590-WTP-VV-M-01-001 Rev 4, Verification and Validation Report for Pipe-Flo Professional
Code Platform (Workstation, PC-based, Mainframe)	Windows NT Version 4.0 SP6A workstations: Compaq AP500, Deskpro ENS, AP550, Deskpro EN, Evo D500, W6000 single Processor and AP400 Windows 2000 Version 5.0 SP3 workstations: Compaq Deskpro ENS, AP550, Evo D500, Evo D510, and W6000 Single Processor
Operating System (Windows #, DOS, Other)	Windows NT Version 4.0 SP6A and/or Windows 2000 Version 5.0 SP3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Errors are reported on screen at local workstation when the program hits an error/interrupt. Questions answered by consultation with another engineer,

	engineering automation, or vendor.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Due to the limited number of pumps contained in the software database, engineering judgment must be used when filling out the Mechanical System Data Sheet to start the bid-procurement process.
Design and analysis work being performed using this application	Newtonian, non-compressible, fluid flow through piping systems.

Survey Information Prepared By:

Name: **Farhang Ostadan**
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **415-768-3734**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	SASSI 2000
Function of code	Analysis of soil-structure interaction
*Area of applicability - see above	C
Application (what projects/facilities at the site/lab)	All Seismic Category I WTP buildings
Code developer and/or sponsor	University of California, Berkeley
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	University of California, Berkeley
Documentation available	Computer Service Library of Bechtel Corp. in San Francisco, California
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows 95/98/2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Report to technical specialist or Computer Service Library of Bechtel Corp. in San Francisco, California
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Specialized program needs experienced user
Design and analysis work being performed using this application	Analysis of soil-structure interaction

Survey Information Prepared By:

Name: Jack Ho
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: (509) 371-3221/jsho@bechtel.com/(509)371-3001
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	EA399 / Setroute Ver. 8.7.1.1
Function of code	Cable, raceway and wiring system
*Area of applicability - see above	Electrical Systems
Application (what projects/facilities at the site/lab)	WTP / All Facilities and Construction Site
Code developer and/or sponsor	Bechtel Information Systems & Technology (IS&T) / Kenneth Hobbs
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Bechtel Corporation (Owner) and David Kennedy (TechnicaSupport)
Documentation available	Bechtel Software Library
Code Platform (Workstation, PC-based, Mainframe)	Workstation
Operating System (Windows #, DOS, Other)	WIN 2000 Service Pack 3
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	R
How are error and user questions reported?	Error and user questions are reported to Setroute Administrator and Program Sponsor and also forwarded to Setroute tTchnical Support.
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	An efficient software program to be used on the project. No error and issues has been identified for SR ver. 8.7.1.1.
Design and analysis work being performed using this application	Yes, electrical engineers, designers, project control and construction are using this application.

Survey Information Prepared By:

Name: **Farhang Ostadan**
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: **415-768-3734**
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	SHAKE 2000
Function of code	Program for conducting equivalent linear seismic response analyses of horizontally layered soil deposits
*Area of applicability - see above	C
Application (what projects/facilities at the site/lab)	All Seismic Category I WTP buildings
Code developer and/or sponsor	Bechtel
Commercial, Proprietary, or Other (explain)	P
Current Owner/Vendor and technical support provider	Bechtel
Documentation available	Computer Service Library of Bechtel Corp. in San Francisco, California
Code Platform (Workstation, PC-based, Mainframe)	PC-based
Operating System (Windows #, DOS, Other)	Windows 95/98/2000
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	O
How are error and user questions reported?	Report to technical specialist or the Computer Service Library of Bechtel Corp. in San Francisco, California
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Specialized program needs experienced user
Design and analysis work being performed using this application	Equivalent linear seismic response analyses of horizontally layered soil deposits

Survey Information Prepared By:

Name: Robert Niall Hunt
Organization: **Bechtel National, Inc.**
Site or Laboratory: **River Protection Project - Waste Treatment Plant, Hanford**
Address: **2435 Stevens Center Place, Richland WA 99352**
Phone/email/facsimile: 371-3314
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
Application is used in the analysis and design of safety class and safety significant structures, systems, and components in the following areas: Civil/Structural/Geotechnical Systems, Mechanical Systems, HVAC, Electrical Systems, Fire Protection Systems, Instrumentation and Control, Other.

For each safety software application identified:

Code/application name and version	WINNupra, Version 2.0
Function of code	Integrated Probabilistic Risk Assessments
*Area of applicability - see above	Other - Reliability Analysis
Application (what projects/facilities at the site/lab)	WTP Operations Risk Assessment
Code developer and/or sponsor	SCIENTECH, Inc.
Commercial, Proprietary, or Other (explain)	Proprietary
Current Owner/Vendor and technical support provider	SCIENTECH, Inc.
Documentation available	User's Manual, V&V Report
Code Platform (Workstation, PC-based, Mainframe)	PC-Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	O
How are error and user questions reported?	There si an error reporting process to SCIENTECH
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	No problems although we do not use all of the functions provided by the code.
Design and analysis work being performed using this application	Reliability analyses (Fault trees) for WTP system configurations

Department of Energy/Office of Environmental Management

Hanford

CH2M Hill Hanford Group, Inc.

Survey of Safety Software
Used in Design of Structures, Systems, and Components

1. Survey Information Prepared By

Name(s):	**Ernie Hamm, Larry Julyk, Robert Brown, Jack Nicholson, Dave Barnes**
Organization(s):	**CH2M HILL Hanford Group Inc.**
Site or Laboratory:	**Office of River Protection, Hanford Site**
Address:	**P.O. Box 1500, MSIN R1-14 Richland, Washington 99352**
Phone/email/facsimile:	**(509) 372-0310 FAX (509) 372-1608**
Principal DOE organization(s) supported (NNSA, EM, NE, etc.):	**EM**
Date Survey Form Submitted:	**11/15/03**

2. Design Safety Software

Area of Applicability	Computer Software Name*
Civil/Structural/Geotechnical Systems	ANSYS/ Mechanical Version 7.0
Mechanical Systems	AutoPIPE
HVAC	GOTH-SNF
Electrical Systems	None
Fire Protection Systems	None
Instrumentation and Control	None
Others (not included above)	Micro-Shield 6.01

* Enter "None" if no safety software in applicable the area.

3. Safety Software Information

a.	Code name and version	ANSYS/ Mechanical Version 7.0
b.	Function of code	General purpose finite-element code used to solve linear and non-linear, static and dynamic structural, and heat transfer problems.
c.	Application (what projects/facilities at the site/lab)	Double-Shell Tank Integrity Program, Single- and Double-Shell Dome Load Program, PUREX connector analysis for Waste Feed Delivery Project, support for Tank Farm FSAR.
d.	Code developer and/or sponsor	ANSYS, Inc. Address: Southpointe 275 Technology Drive Canonsburg, PA 15317 Email: ansysinfo@ansys.com Web: http//www.ansys.com Phone: 724-746-3304
e.	Commercial, Proprietary or Other (Explain)	C; Site-license
f.	Current Owner/Vendor and technical support provider	Same as (d) above; Technical Support included in Site license fee through East coast vendor JLR, The Engineering Solutions Company Address: 111 SE Everett Mail Way, Suite E-201 Everett, WA 98208-3236 Email: jradochia@jlrcom.com Web: http//www.jlrcom.com Phone: 425-353-8089, x251
g.	Documentation available	1. User's Manual (hard copy and online) 2. Verification Manual 3. Class notes
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows XP

j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	ANSYS, Inc. provides hard copy Class 3 error reports and QA Notices. Website and customer portal also provided as well as direct contact support for user questions.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Formal training classes are available by vender. Documentation is available on-line for current version and updates. Vender is responsive to user identification of potential errors. Patches and updates are periodically made available to correct errors.

a.	Code name and version	AutoPIPE, Version 6.2
b.	Function of code	Piping stress analysis for safety and non-safety related systems (ASME B31 and Boiler and Pressure Vessel Code piping systems)
c.	Application (what projects/facilities at the site/lab)	Project W-211 and W-314; safety significant and general service piping systems
d.	Code developer and/or sponsor	Rebis/Bently Corporate Headquarters address: 685 Stockton Drive Exton, PA 19341 E-mail: autopipe.com Phone: 1-800-236-8539 (corporate & technical)
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Same as (d.) above; Technical Support is included and is part of Site license fee.
g.	Documentation available	1. User's Manual 2. Verification Manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	The vendor reports updates and sends out error notices via email. A website exists for reporting software problems and posing questions on use of the code. Response is within 24 hours of the request.
l.	Comments on experience with this computer software, ease of	Documentation is upgraded with each version update.

	application, documentation provided; known errors or issues	Experience with this software has been good and relatively few (minor) errors have been identified in more than five years of use.

a.	Code name and version	Micro-Shield 6.01
b.	Function of code	Estimate radiation levels and evaluate shielding
c.	Application (what projects/facilities at the site/lab)	Tank Farm Nuclear Facilities
d.	Code developer and/or sponsor	Grove Engineering 15215 Shady Grove Road Rockville, MD 20850
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Grove Engineering 15215 Shady Grove Road Rockville, MD 20850
g.	Documentation available	Users Manual Verification Manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Customer help lines
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This is a good software package. It requires the user to have a knowledge of Health Physics. This is a recent upgrade from 5.05.

a.	Code name and version	GOTH-SNF Version 5.3 and Version 6
b.	Function of code	GOTH-SNF is a multi-dimensional, multi-phase, finite-difference, thermal-hydraulic computer code
c.	Application (what projects/facilities at the site/lab)	Analyzing pneumatic flow and pressure drops for the new Project 314 provided exhauster, and for analyses of waste tanks.
d.	Code developer and/or sponsor	John Marvin, Incorporated (JMI) 5335 West Van Giesen Street West Richland, WA 99353 509-967-2940
e.	Commercial, Proprietary or Other (Explain)	Proprietary
f.	Current Owner/Vendor and technical support provider	John Marvin Incorporated
g.	Documentation available	Analysis Output and QA documentation
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation
i.	Operating System (Windows, DOS, other)	Unknown
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Proprietary Code: Handled internal to the vendor
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This software was derived from the EPRI GOTHIC code and has been used to support various Tank Farm Design Efforts for several years.

Department of Energy/Office of Environmental Management

Hanford

Duratek Federal Services

Survey Information Prepared By:

Name: Duratek
Organization: Federal Services
Site or Laboratory: **River Protection Project - Waste Treatment and Immobilization Plant, Richland, WA**
Address: 345 Hill St, Richland WA
Phone/email/facsimile: 509-376-9942
Principal DOE Organization(s) supported: **U.S. Department of Energy, Office of River Protection**

Applicability
List the commercial software packages and proprietary software used in the analysis, design, and testing of design for the Waste Treatment and Immobilization Plant (WTP) in Richland, WA.

For each safety software application identified:

Code/application name and version	Fluent/Gambit
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Fluent
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Fluent
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Process CFD design of gas flow and heat transfer.

Code/application name and version	Algor
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Algor
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Algor
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Structural and seismic analysis of melter and heat transfer of refractory.

Code/application name and version	Flex PDE
Function of code	Finite Element Analysis .
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Flex PDE
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Flex PDE
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Electrical design for melter electrodes and bus work.

Code/application name and version	LS-DYNA and LS-POST
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	LSTC (Livermore Software Technology Corp.)
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	LSTC (Livermore Software Technology Corp.)
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Non Linear stress analysis of melter dam

Code/application name and version	Ansoft Mawell 3-D
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Ansoft
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Ansoft
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Analysis of electrical fields for bus work of glass melter.

Code/application name and version	ANSYS
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	ANSYS
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	ANSYS
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Used for structural analysis of glass melter damn and trough.

Code/application name and version	MCNP/ORIGEN
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Origen
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Origen
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Used for radioactive shielding calculations associated with the waste glass melters..

Code/application name and version	COSMOS
Function of code	Finite Element Analysis
*Area of applicability - see above	Waste Glass Melter Design
Application (what projects/facilities at the site/lab)	River Protection Project Waste Glass Melters
Code developer and/or sponsor	Structural Research & Analysis Corporation (SRAC)
Commercial, Proprietary, or Other (explain)	Commercial
Current Owner/Vendor and technical support provider	Structural Research & Analysis Corporation (SRAC)
Documentation available	Manuals and CDs
Code Platform (Workstation, PC-based, Mainframe)	PC Based
Operating System (Windows #, DOS, Other)	Windows
Frequency of Use (Routine, repeated use, code of choice -R; Occasional - O)	Occasional
How are error and user questions reported?	E-mail and website
Comments on experience with this computer software, ease of application; documentation provided; known errors or issues.	Good. No issues
Design and analysis work being performed using this application	Used for structural and thermal analysis of the waste glass melters..

Department of Energy/Office of Environmental Management

Hanford

Richland Operations Office/Fluor Hanford, Inc.

U.S. Department of Energy
Richland Operations Office

Schedule for Conducting Software Quality Assurance Assessments (Commitments 4.2.3.2 and 4.2.4.2, DOE Implementation Plan for DNFSB Recommendation 2002-1)

Attachment 1 provides a schedule for completing the identification, selection, and assessment of safety system software and safety analysis and design software.

The following assumptions were made in order to bound the workscope:

- Safety Software was identified as that supporting selected Vital Safety Systems tracked in accordance with DNFSB Recommendation 2000-2, that used in the design and analysis of passive safety systems, and that used in safety analyses.
- Safety Software includes design software and design modifications used since the start of the Project Hanford Management Contract (PHMC) on October 1, 1996.
- Safety Software does not include software systems used by subcontracted vendors that performed design or analysis under contracts with already defined quality assurance standards.
- Safety Software includes only repetitive use software (no hand calculations or single-use applications wholly incorporated into technical reports).

The schedule broadly identifies the activities and their durations from the time RL gives formal direction to its contractor for undertaking the assessments. It is noted that the definitions for Safety Software and Safety System Software do not currently exist in the PHMC.

During FY 2003, RL's prime contractor, Fluor Hanford Inc. restructured its entire software QA program; requiring all projects to have a Software Management Plan, and to evaluate all inventoried software against current NQA software life cycle requirements for compliance. This work effort was completed at the end of FY 2003 and, therefore, all Safety Software can be expected to meet quality assurance expectations.

Software List

Software Short Name	Version	Vendor	Discipline/ Function	Abstract
VAM3DF	1	Hydro Geologic	Nuclear Engineering	3-D flow and transport
ABAQUS	5.8	Abaqus, Inc.	Civil/Structural Engineering	Nonlinear/advanced linear finite element analysis
SASSI	1.1	Advanced Computational Software	Civil/Structural Engineering	Soil structure interaction finite element analysis
ANSYS	5.5, 5.7	Ansys, Inc.	Civil/Structural Engineering	General service finite element program
SAP2000 Plus	6.13	Computers & Structures, Inc.	Civil/Structural Engineering	General service finite element program
SAP Nonlinear	8.0	Computers & Structures, Inc.	Civil/Structural Engineering	General service finite element program, includes nonlinear capabilities
WaterCAD	6.0	Haestad Methods	Civil/Structural Engineering	Water distribution analysis
RISA3D	4.5	RISA Technologies	Civil/Structural Engineering	Small scale finite element program
PTW	4.5.11	SKM Power Tools	Electrical Engineering	Power system analysis
AUTOPIPE	6.2	Bentley	Mechanical Engineering	Piping system stress analysis
HASS	6.1 R2	HRS Systems, Inc.	Mechanical Engineering	Fire protection system analysis
Pipe-Flo	6.0	Engineered Software	Mechanical Engineering	Pipe flow analysis
MATLAB	6.10.4	-	Process Engineering	Analysis of differential equations

October 23, 2003

Department of Energy/Office of Environmental Management

Miamisburg Closure Project

Survey of Safety Software
Used in Design of Structures, Systems, and Components

1. Introduction

The Department's Implementation Plan for Software Quality Assurance (SQA) that was developed in response to Defense Nuclear Facilities Safety Board Recommendation 2002-01, *Quality Assurance for Safety-Related Software*, includes a commitment (4.2.1.5) to conduct a survey of design codes currently in use to determine if any should be included as part of the toolbox codes. The toolbox codes are a small number of standard computer models (codes) supporting DOE safety analysis that have widespread use and appropriate qualification. Generally, the toolbox codes will have been developed and maintained within the DOE complex. However, the toolbox may also include commercial proprietary design codes where additional software quality assurance controls are appropriate.

The scope of the survey required by commitment 4.2.1.5 includes the identification of safety software currently use to support the analysis and design of defense nuclear facilities including structures, systems and components, as well electrical and control system design. Both commercial off-the-shelf software and DOE/contractor developed software should be included in the survey. Often the same software is used for both safety and non-safety, and nuclear and non-nuclear facility design. Therefore, care should be taken in identifying the safety software.

DOE field elements, including contractors and sub-contractors, as appropriate, should provide the information in the attached survey forms. The Office of Environment, Safety and Health (EH) will review the information submitted through this survey and determine if additional safety software should be included as toolbox codes.

In addition to the safety software information requested in this survey, EH would also like to receive information regarding your organization's SQA programs, procedures and training. This information should be entered in Section 5 of the survey form. This information will assist EH in the preparation of DOE SQA directives, which are also an Implementation Plan deliverable. However, this Section 5 of the survey form is optional.

If you have technical questions regarding the survey please contact Chip Lagdon, EH-31, at (301) 903-4218 or Larry Vaughan, EM-5, at (202) 586-2523.

2. Survey Information Prepared By

Name(s):	**John Saluke**
Organization(s):	**DOE/OH/MCP**
Site or Laboratory:	**Miamisburg Closure Project**
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Phone/email/facsimile:	**937-865-3747/** john.saluke@ohio.doe.com/ **937-847-8352**

Principal DOE organization(s) supported (NNSA, EM, NE, etc.) EM

Date Survey Form Submitted: Jan 14, 2004

3. Design Safety Software

List the commercial software packages used in the analysis and design of safety class and safety significant structures, systems, and components for DOE defense nuclear facilities. Also, list the proprietary software used in the analysis and design of safety class and safety significant structures, systems, and components where the software was used at more than one DOE site. (Note: This question was revised by EM.)

Attach additional sheets if needed.

Area of Applicability	**Computer Software Name***
Civil/Structural/Geotechnical Systems	None
Mechanical Systems	None
HVAC	Andover Direct Digital Control Software
Electrical Systems	None
Fire Protection Systems	Silent Knight Software Suite
Instrumentation and Control	None
Others (not included above)	None

* Enter "None" if no safety software in applicable the area.

4. Safety Software Information

For each safety software application identified in Section 3, provide the information requested below. Attachment 1 is provided as an example. For additional assistance, email questions to sqa@eh.doe.gov.

a.	Code name and version	Andover Direct Digital Control Software (installed ~1982-1998)
b.	Function of code	Monitors and controls ventilation system parameters
c.	Application (what projects/facilities at the site/lab)	T Bldg Haz Cat 2 (downgrade to rad facility expected Sep 2004) SW/R Complex Haz Cat 2 (downgrade to rad facility expected March 2004)
d.	Code developer and/or sponsor	Andover Controls
e.	Commercial, Proprietary or Other (Explain)	P
f.	Current Owner/Vendor and technical support provider	Environmental Temperature Controls Springboro OH
g.	Documentation available	User Manual Drawings for each installation Temperature Control Submittals
h.	Code platform (Workstation, PC-based, Mainframe)	Firmware in controllers Workstations
i.	Operating System (Windows, DOS, other)	Controller - DOS 5 Workstation - Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Reported to DDC Coordinator and Ventilation System Engineer Resolved by DDC Coordinator and Ventilation System Engineer or Environmental Temperature Control
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Very good experience No errors or issues to report

a.	Code name and version	Silent Knight Software Suite Model 5660, Version 2.2.3
b.	Function of code	Monitors alarm and status signals for the fire detection system. System is linked to central supervising station at Savannah River Site
c.	Application (what projects/facilities at the site/lab)	T Bldg Haz Cat 2 (downgrade to rad facility expected Sep 2004) SW/R Complex Haz Cat 2 (downgrade to rad facility expected March 2004)
d.	Code developer and/or sponsor	Silent Knight
e.	Commercial, Proprietary or Other (Explain)	P
f.	Current Owner/Vendor and technical support provider	Silent Knight
g.	Documentation available	User Manual Drawings for each installation
h.	Code platform (Workstation, PC-based, Mainframe)	Firmware in controllers Workstations
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Reported to Fire Protection Supervisor Resolved by Fire Protection Supervisor or Silent Knight
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Moderate ease of application

5. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software?

MD-10541

5.2 Document title(s) and report number(s):

MD-10541, Software Quality Assurance Plan for Mound Exit Project, Issue 1

5.3 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	**Standard/Rule/DOE or Other Directive**
Yes	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Yes	d. DOE Order 414.1, *Quality Assurance*
	e. DOE Order 420.1, *Facility Safety*
Yes	f. DOE Order 200.1, *Information Management Program*
	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
	h. DOE Guide 414.1-1, Assessment Guide for QA
	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
Yes DOE N 203.1	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify)

5.4 How do you apply QA procedures to safety software?

5.5 How do you train users on safety software?

Vendor training provided to users. Review of User Manual by system operators.

Attachment 1. EXAMPLE OF SAFETY SOFTWARE INFORMATION

The following input is provided to guide survey respondents on the level of detail for completing the Section 4 survey information

a.	Code name and version	STRUCTUREcode; Version 2003.1
b.	Function of code	STRUCTRUEcode is used in the structural analysis and design of nuclear facilities and related structures.
c.	Application (what projects/facilities at the site/lab)	The software has been used in the analysis of many Hazard Category 2 and 3 facilities at the Site. It was used in the design of Facility A, and the upgrades to Facility B.
d.	Code developer and/or sponsor	XYZ Structural Safety Associates, Address: Email: Phone:
e.	Commercial, Proprietary or Other (Explain)	P; Site-license
f.	Current Owner/Vendor and technical support provider	Same as (d.) above; Technical Support is included and is part of Site license fee.
g.	Documentation available	1. User's Manual 2. Software Model Description 3. Software Requirements Specification 4. Test Problems- Input and Output files
h.	Code platform (Workstation, PC-based, Mainframe)	The software runs on a PC-based platform.
i.	Operating System (Windows, DOS, other)	WINDOWS-NT, -XP; -2000 are supported.
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	The vendor reports updates and sends out error notices via email. A website exists for reporting software problems and posing questions on use of the code. Response is within 24 hours of the request.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	STRUCTUREcode requires a formal training class (given by vendor) and completion of several test studies before a user is qualified. Most users are structural engineers at the BS level. Documentation is upgraded with each version update. Experience with this software has been good and relatively few (minor) errors have been identified in five years of use.

Department of Energy/Office of Environmental Management

Rocky Flats Environmental Technology Site

Kaiser-Hill Company, LLC

Survey of Safety Software
Used in Design of Structures, Systems, and Components

1. Survey Information Prepared By

Name(s):	Doyle Gillespie
Organization(s):	Kaiser-Hill Company, LLC
Site or Laboratory:	Rocky Flats Environmental Technology Site
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Principal DOE organization(s) supported (NNSA, EM, NE, etc.) EM

Date Survey Form Submitted: 10/23/03

2. Design Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Attach additional sheets if needed.

Area of Applicability	Computer Software Name*
Civil/Structural/Geotechnical Systems	None
Mechanical Systems	None
HVAC	None
Electrical Systems	None
Fire Protection Systems	HASS FAST
Instrumentation and Control	None
Others (not included above)	RADIDOSE

* Enter "None" if no safety software in applicable the area.

3. Safety Software Information

For each safety software application identified in Section 3, provide the information requested below. Attachment 1 is provided as an example. For additional assistance, email questions to sqa@eh.doe.gov.

a.	Code name and version	HASS v 7.4
b.	Function of code	Hydraulic Model
c.	Application (what projects/facilities at the site/lab)	Fire Protection – Sprinkler System design
d.	Code developer and/or sponsor	HRS Systems, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	HRS
g.	Documentation available	Vendor-provided Manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	To/through vendor – none experienced to date
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Good experience, well-considered by industry

a.	Code name and version	FAST v 3.1.7
b.	Function of code	Fire and Smoke Modeling
c.	Application (what projects/facilities at the site/lab)	Fire Protection: Fire and Smoke modeling
d.	Code developer and/or sponsor	NIST Building and Fire Research
e.	Commercial, Proprietary or Other (Explain)	Government
f.	Current Owner/Vendor and technical support provider	NIST
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	To NIST directly
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Most Used Program in United States for this application

a.	Code name and version	RADIDOSE v 1.4.3
b.	Function of code	Analyze radiological consequences from postulated accidents based on potential configuration/operational changes
c.	Application (what projects/facilities at the site/lab)	All nonreactor nuclear facilities on Site.
d.	Code developer and/or sponsor	Kaiser-Hill
e.	Commercial, Proprietary or Other (Explain)	O – this software is specific to Rocky Flats
f.	Current Owner/Vendor and technical support provider	Kaiser-Hill Nuclear Safety and Licensing
g.	Documentation available	Can be obtained on the Intra-Net on Site
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows; code embedded in Micosoft Excel
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Via e-mail to Site owner
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Easy to use; simple to apply. No issues currently identified.

4/5. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software?_____

Document title(s) and report number(s): MAN-004 CSMM Computer Software Management Manual

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	Standard/Rule/DOE or Other Directive
Y	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
Y	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
NA	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Y	d. DOE Order 414.1, *Quality Assurance*
Y	e. DOE Order 420.1, *Facility Safety*
Y	f. DOE Order 200.1, *Information Management Program*
U	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
U	h. DOE Guide 414.1-1, Assessment Guide for QA
Y	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
DOE/CBFO-94-1012	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify)

5.3 How do you apply QA procedures to safety software? Via software QA plans generated to comply with MAN-004-CSMM

5.4 How do you train users on safety software? Site Training Program

Department of Energy/Office of Environmental Management

Savannah River Site

Westinghouse Savannah River Company

2. Survey Information Prepared By

Name(s):	**Keith Morrell**
Organization(s):	**WSRC**
Site or Laboratory:	**SRS**
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	keith.morrell@srs.gov
Principal DOE organization(s) supported (NNSA, EM)	
Date Survey Form Submitted:	**10/31/03**

3. Design and Analysis Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Attach additional sheets if needed.

Area of Applicability	**Computer Software Name***
Civil/Structural/Geotechnical Systems	GTStrudl, Shake91, SASSI, SRPP,
	ABAQUS
Mechanical Systems	ANSYS,
	Autopipe Plus, Type 1 Tank Top Load, Type II, III & IIIA Tank Top Load, MCS/THERMAL,ABAQUS
HVAC	None
Electrical Systems	PDMS, ETAP
Fire Protection Systems	None
Instrumentation and Control	None
Others (not included above)	VERSE-LC

- Enter “None” if no safety software is applicable the area.

4. Design & Analysis Safety Software Information

a.	Code name and version	GTStrudl Version 26
b.	Function of code	Finite Element Code for analysis and design of structures.
c.	Application (what projects/facilities at the site/lab)	Tank Farm tank top structures. TEF interior steel structures
d.	Code developer and/or sponsor	Georgia Institute of Technology – Computer Aided Structural Engineering Laboratory
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Georgia Institute of Technology – Computer Aided Structural Engineering Laboratory
g.	Documentation available	User Documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	Windows 2000 and later
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Contact with GT through the PE&CD Software library.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Excellent.

Design & Analysis Safety Software Information

a.	Code name and version	SHAKE91
b.	Function of code	Establish soil behavior under the action of seismic motion. Used a basis for input to other programs such as SASSI.
c.	Application (what projects/facilities at the site/lab)	Tank Farm underground tanks. TEF Process Building, KAMS Program.
d.	Code developer and/or sponsor	University of California
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	University of California
g.	Documentation available	User Documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	PC, WorkStation and Mainframe
i.	Operating System (Windows, DOS, other)	Windows NT and later
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Contact with University of California through the PE&CD Software library.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Code requires expert knowledge in soil-structure interaction analysis. Code does not have GUI.

Design & Analysis Safety Software Information

a.	Code name and version	SASSI 2000
b.	Function of code	Finite Element Code for the soil-structure interaction of surface and embedded structures.
c.	Application (what projects/facilities at the site/lab)	Tank Farm underground tanks. TEF Process Building, KAMS Program.
d.	Code developer and/or sponsor	University of California
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	University of California
g.	Documentation available	User Documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	PC, WorkStation and Mainframe
i.	Operating System (Windows, DOS, other)	Windows NT and later
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Contact with University of California through the PE&CD Software library.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Code requires expert knowledge in soil-structure interaction analysis. Code does not have GUI..

Design & Analysis Safety Software Information

a.	Code name and version	SRPP
b.	Function of code	Develop seismic time histories whose response spectra match a given design response spectrum.
c.	Application (what projects/facilities at the site/lab)	Tank Farm underground tanks. TEF Process Building, KAMS Program.
d.	Code developer and/or sponsor	University South Carolina
e.	Commercial, Proprietary or Other (Explain)	Owned by DOE Developed through SCURF funds.
f.	Current Owner/Vendor and technical support provider	DOE Technical support by WSRC PE&CD Structural Mechanics Section
g.	Documentation available	User Documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	PC,
i.	Operating System (Windows, DOS, other)	Windows NT and later
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Contact with WSRC Structural Mechanics Department.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This code will be retired within the next two years since criteria for enveloping response spectra will be changed with the release of the governing ASCE Standard

Design & Analysis Safety Software Information

a.	Code name and version	ANSYS/Mechanical, versions 5.7, 6.0, 6.1, 7.0
b.	Function of code	Structural analysis and design of nuclear facility systems, structure and components.
c.	Application (what projects/facilities at the site/lab)	The software has been used extensively in the evaluation of many Hazard Category 2 and 3 systems, structures and components at the Site. Examples include the 3013 storage container welds, 3013 storage racks, and TEF module tops.
d.	Code developer and/or sponsor	ANSYS, Inc. Southpointe 275 Technology Drive Canonsburg, PA, 15317 Ansysinfo@ansys.com
e.	Commercial, Proprietary or Other (Explain)	P, Controlled license access (managed by FlexLM)
f.	Current Owner/Vendor and technical support provider	Mallett Technology 4601 Creekstone Drive, Suite 112 Durham, NC 27703 919/474-9222
g.	Documentation available	User's Manual, Verification Manual,
h.	Code platform (Workstation, PC-based, Mainframe)	Two platforms are used at SRS: Sun Work Station and PC-based
i.	Operating System (Windows, DOS, other)	SUN UltraSPARC/Solaris Windows NT, 98 & 2000
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	The vendor reports Code updates. The Code developer sends out error notices via email
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Program benefits from ease of use for routine evaluations typical at SRS. Complex evaluations require formal training for advanced users.

Design & Analysis Safety Software Information

a.	Code name and version	Type II, III, & IIIA Tank Top Load Program, Version 1 Type I Tank Top Load Program, Version 0
b.	Function of code	To maintain the structural integrity of the Types I, II, III & IIIA Tanks, these two Programs evaluate the reinforced concrete tank tops for tank top loads (track tank top loads and evaluate changes in these loads).
c.	Application (what projects/facilities at the site/lab)	The Type I, II, III, & IIIA Tanks in F and H Areas.
d.	Code developer and/or sponsor	Structural Mechanics Wade Faires 730-1B/2174
e.	Commercial, Proprietary or Other (Explain)	Other – Used to evaluate the tank top loads (tracks loads and evaluate changes) for the Type I, II, III & IIIA Tanks in F and H Areas.
f.	Current Owner/Vendor and technical support provider	Same as "d."
g.	Documentation available	Software Quality Assurance Plan, Validation Package and User Manual (with test problems). No formal training is required. User friendly.
h.	Code platform (Workstation, PC-based, Mainframe)	PC Based
i.	Operating System (Windows, DOS, other)	WINDOWS-98, NT, & 2000 are supported.
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Software Error Notice (SEN) Forms are used to report errors and are sent out via email. A website exists for reporting software problems and posing questions on use of the code. Response is within 24 hours of the request.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	The two programs enable tank top loads to be tracked and changes (adds/deletes) evaluated in a timely and efficient manner. No errors have been reported or issues identified.

Design & Analysis Safety Software Information

a.	Code name and version	PDMS - Plant Data Management System
b.	Function of code	Track Electrical Components: cable routing and conduit & tray percent fills and their weights per ft.
c.	Application (what projects/facilities at the site/lab)	All site areas that have opt to use it.
d.	Code developer and/or sponsor	Cygna Energy Services (Glenn Smith and Tim Fay)
e.	Commercial, Proprietary or Other (Explain)	Commercial (then made client specific for SRS use)
f.	Current Owner/Vendor and technical support provider	Cygna Energy Services
g.	Documentation available	Validation Reports, Test Reports/Cases, Topology, User Guide(s) and other release documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	UNIX server with Windows 2000 client (minimum)
i.	Operating System (Windows, DOS, other)	Windows 2000
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Daily routine functions
k.	How are error and user questions reported?	Email to SRS Authority then to Vendor through SRS error handle process.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Used in all phases of SRS Projects. Design, construction, operations and maintenance. Large user base. Living database & documentation. Learning curve = 10-20 hands-on-hours.

Design & Analysis Safety Software Information

a.	Code name and version	ETAP 3.0.1N/4.7N/4.7.4N
b.	Function of code	Electrical analysis and calculation
c.	Application (what projects/facilities at the site/lab)	Any/all projects and facilities
d.	Code developer and/or sponsor	Operations Technology, Inc. (OTI)
e.	Commercial, Proprietary or Other (Explain)	Commercial software but proprietary code
f.	Current Owner/Vendor and technical support provider	BSRI/OTI
g.	Documentation available	Manuals test cases and error notification
h.	Code platform (Workstation, PC-based, Mainframe)	PC Workstation stand alone
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Notification system from vendor (OTI) to BSRI Software Library, then to users from BSRI Software Library
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Very good quality product

Design & Analysis Safety Software Information

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a.	Code name and version	AutoPIPE Version 6.20.09
b.	Function of code	AutoPIPE is used for the structural analysis of piping systems.
c.	Application (what projects/facilities at the site/lab)	General site application used for all functional classifications (GS,PS,SS,SC) and performance categories (PC-0 thru PC-4) as necessary.
d.	Code developer and/or sponsor	Bentley Address: 1600 Riviera Ave., Suite 300 Walnut reek, CA 94596 Phone: 925-933-2525
e.	Commercial, Proprietary or Other (Explain)	P, Site licensed (17 users)
f.	Current Owner/Vendor and technical support provider	Same as (d) above; Technical Support is included and is part of Site license fee.
g.	Documentation available	User Manual (computer based) Initial Software Verification Software Validation Report Microcomputer Application Control Form and Software Revision Description User Software Verification Instructions
h.	Code platform (Workstation, PC-based, Mainframe)	PC-Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Critical errors are by phone and email within 24 hr of confirmation. Vendor reports updates and sends out error notices via email on a monthly basis. The vendor can be contacted by phone for immediate response. A website exists for reporting software problems and posing questions on use of the code. Response is within 24 hours of the request.

Design & Analysis Safety Software Information

a.	Code name and version	ABAQUS, Version 5.8
b.	Function of code	Structural and heat conduction analyses
c.	Application (what projects/facilities at the site/lab)	Structural analyses of Type B radioactive material packages such as 9975, SAFKEG, and 5320.
d.	Code developer and/or sponsor	Hibbitt, Karlsson & Sorensen, Inc. 1080 Main Street Pawtucket, RI 02860-4847 Tel. 401-727-4200 Email: info@abaqus.com
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Same as (d.) above; Technical Support is included and is part of the license fee.
g.	Documentation available	User's Manual. Sample Problems including input and output files.
h.	Code platform (Workstation, PC-based, Mainframe)	Mainframe; Workstation; PC-based
i.	Operating System (Windows, DOS, other)	UNIX; WINDOWS 2000
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	The vendor reports updates and sends out error notices via mail.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Vendor documentation is upgraded with each version update.

Design & Analysis Safety Software Information

a.	Code name and version	MSC/THERMAL Version 8.5
b.	Function of code	Thermal analysis for the design of subsystems and components. The pre-processor MSC/PATRAN is used to create finite element models for thermal and structural analyses.
c.	Application (what projects/facilities at the site/lab)	Type B radioactive material packages such as 9975, SAFKEG, and 5320, furnaces in the FB-Line and HB-Line, material storage cans, inertial welds.
d.	Code developer and/or sponsor	MacNeal-Schwendler Corporation, Costa Mesa, CA www.mscsoftware.com PH: 1-800-732-7284
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Same as (d.) above; Technical Support is included and is part of the license fee.
g.	Documentation available	On-Line documentation, test problems selected by SRS are used for QA documentation.
h.	Code platform (Workstation, PC-based, Mainframe)	Mainframe; Workstation; PC-based
i.	Operating System (Windows, DOS, other)	UNIX; WINDOWS 2000
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Errors and patches are posted on the developer website. Solutions and patches are posted on the website.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Vendor documentation is upgraded with each version update.

Design & Analysis Safety Software Information

a.	Code name and version	VERSE-LC v7.80
b.	Function of code	VERSE is an advanced dynamic simulation package for both batch and continuous liquid chromatography.
c.	Application (what projects/facilities at the site/lab)	Ion-Exchange Modeling: Low Curie Salt Program Hanford Waste Treatment Plant
d.	Code developer and/or sponsor	R. D. Whitley and N-H. L. Wang School of Chemical Engineering, Purdue University
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Same as (d) above.
g.	Documentation available	HTML User's Guide
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows-NT and 2000 are supported.
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Errors and user questions are reported to the developers via email or phone.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	University developed code. No user interface. HTML documentation.

5. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software? **Site SQA procedure QAP 20-1 and Engineering SQA E7 Manual**
Document title(s) and report number(s): **Attachment 1**

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	**Standard/Rule/DOE or Other Directive**
Yes	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
Yes	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
Yes	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Yes	d. DOE Order 414.1, *Quality Assurance*
Yes	e. DOE Order 420.1, *Facility Safety*
Yes	f. DOE Order 200.1, *Information Management Program*
Yes	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
Yes	h. DOE Guide 414.1-1, Assessment Guide for QA
Uncertain	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
Yes	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines

5.3 How do you apply QA procedures to safety software? Graded approach based on classification. Using 5.2 documents above as guidance. Details are in procedures.

5.4 How do you train users on safety software? Software Engineering Training including SQA, Required reading of QA and SQA procedures, Required user documentation and training of users. Simulators are used where applicable.

Attachment 1

WSRC 1Q Quality Assurance Manual

20-1 Software Quality Assurance

WSRC E7 Conduct of Engineering and Technical Support

Section 2.0 - Technical Baseline Change Control
- 2.25 Functional Classification
- 2.31 Engineering Calculations
- 2.40 Design Verification and Checking

Section 5.0 - Software Engineering and Control
- 5.01 Software Engineering and Control - Overview
- 5.03 Software Quality Assurance Plan (SQAP)
- 5.04 Software Project Management Plan (SPMP)
- 5.05 Software Classification
- 5.07 Evaluation of Existing or Acquired Software
- 5.10 Software Requirements
- 5.20 Software Design and Implementation
- 5.40 Software Testing, Acceptance and Turnover
- 5.61 Eng. & Scientific Software Distribution and Control
- 5.62 Computer Program Modification Tracker (CMT)
- 5.80 Data Management Plan

Department of Energy/Office of Environmental Management

Waste Isolation Pilot Plant

Carlsbad Field Office

Washington TRU Solutions

Sandia National Laboratories

2. Survey Information Prepared By

Name(s):	James R. Schuetz
Organization(s):	Carlsbad Field Office (CBFO) Technical Assistance Contractor (CTAC)
Site or Laboratory:	Various as follows: (a and b) (a) Washington TRU Solutions (WTS) – performing maintenance and operations for and at the Waste Isolation Pilot Plant (WIPP) repository (b) Sandia National Laboratory – performing contract services related to the design of the Waste Isolation Pilot Plant (WIPP) repository and to the safety of the repository
Address:	Carlsbad Field Office 4021 National Parks Highway Post Office Box 1270 Carlsbad, New Mexico 88221-1270 Attn: J. R. Schuetz / GSA 215 – C235
Phone/email/facsimile:	Ph. (505) 234-7181 FAX (505) 234-1799 e-Mail: james.schuetz@wipp.ws

Principal DOE organization(s) supported (NNSA, EM, NE, etc.) CBFO

Date Survey Form Submitted: December 3, 2003

3. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software?_____

Document title (s) and report number (s): U.S. Department of Energy, Carlsbad Field Office (CBFO), *Quality Assurance Program Document (QAPD)*, DOE/CBFO-94-1012, Revision 5, Effective May 2003 upper-tier requirements document including section 6 related to software quality assurance requirements based on NQA-1 and NQA Part 2, Section 2.7

Washington TRU Solutions (WTS), *Software Screening and Action Plan*, WP 16-2, Revision 4, Effective May 28, 2003 software quality assurance procedure

Sandia National Laboratories (SNL), *Software Requirements*, NP 19-1, Revision 10, Effective may 29, 2003 software quality assurance procedure

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	**Standard/Rule/DOE or Other Directive**
Y CBFO, WTS, and SNL	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
Y CBFO, WTS, and SNL	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
U	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Y CBFO, WTS, and SNL	d. DOE Order 414.1, *Quality Assurance*
Y CBFO, WTS, and SNL	e. DOE Order 420.1, *Facility Safety*
Y CBFO, WTS, and SNL	f. DOE Order 200.1, *Information Management Program*
U	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
Y CBFO, WTS, and SNL	h. DOE Guide 414.1-1, Assessment Guide for QA
U	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
U	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify)

5.3 How do you apply QA procedures to safety software? See section 5.1 of this document for references and procedure numbers for application of software quality assurance to contractor and site activities. Also, contractors are required to implement all sections of the CBFO QAPD including requirements for an internal assessment program. The CBFO QAPD provides details of these requirements and the sites individual procedures give details for site-specific implementation. The CBFO conducts certification audits and annual re-certification audits of individual site QA program implementation. CBFO audit scope includes evaluation of individual site implementation of software quality assurance, training, and QA program activities.

5.3.1 How do you train users on safety software? Contractors conduct classroom training for site personnel to CBFO QAPD requirements. Contractor trains their personnel to site-specific implementation procedures on a required reading basis. Procedure up-dates are also assigned on a required reading basis. This method of training is applicable to technical and quality assurance programmatic procedures.

Department of Energy/Office of Environmental Management

Waste Isolation Pilot Plant

Washington TRU Solutions

Washington TRU Solutions Software Inventory

Area of Applicability	Software Name	Version	Date	Note
Civil/Structural/Geotechnical Systems	NONE			
Mechanical Systems	CAP88 PC Radiation Risk Assessment Software	2.0	1/13/99	
	GENII-S	1.485	10/10/94	For background and assistance from the Hanford software authors visit the following website. http://www.pnl.gov/eshs/software/genii.html
	GXQ	4.0A	4/24/00 6/12/00	
	MetData Application	4/2003	5/5/03	
	RadClient/Radnet	RadclaJ1	8/12/03	
	Lpu02 af.exe	af	6/12/02	
	Lpu 022ab.exe	ab	6/12/02	
HVAC	NONE			
Electrical Systems	NONE			
Fire Protection Systems	NONE			
Instrumentation and Control	NONE			
Others (not included above)	NONE			

Washington TRU Solutions Software Inventory (Cont.)

A. SoftwareName/ Version	**CAP88 PC Radiation Risk Assessment Software - Version 1.0**	**GENII -S Version 1.485**	**GXQ Version 4.0A**
B. Function of Code	CAP88-PC version 1.0 is a personal computer software system used for calculating dose and risk from annual average releases of radionuclide to the air and for demonstrating compliance with 40 CFR 61.93 (a).	Environmental Radiation Dosimetery Software System	General Purpose Atmospheric Dispersion Code produced by Westinghouse Hanford Company Users Guide documented in WHC-SD-GN-SWD-30002 Rev. 1
C. Application	Applied to monitoring and reporting possible release of radioactive materials from the Waste Isolation Pilot Project (WIPP) and estimating surface area impacted.	Applied to Environmental monitoring and reporting at the WIPP site.	Applied to Environmental monitoring and reporting at the WIPP site.
D. Code Developer/Sponsor	EPA – Developer Linda Frank-Supka – Sponsor at the WIPP location	C. Ortiz	B. Faulk J. McCormick
E. Commercial, Proprietary, or Other (explain)	Commercial	Commercial	Commercial
F. Current Owner/ Vendor and Technical Support Provider	EPA	C. Ortiz	B. Faulk J. McCormick
G. Documentation Available	Model Document (including calculation algorithms), User Manual, Installation instructions, WIPP Software Inventory, and WIPP Installation and Check-out Forms (including installation testing and reporting)	User Manuals and Design Documentation	User Manuals and Design Documentation
H. Code Platform (Workstation, PC-based, Mainframe)	Desktop PC	Desktop PC	Desktop PC
I. Operating System (Windows, DOS, Other)	Windows NT, 2000, or XP	DOS	Windows
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	Quarterly	Daily	Daily

Washington TRU Solutions Software Inventory (Cont.)

K. How are Error and User Questions Reported?	Generated internally using the WTS SQA protocol and contacting EPA as appropriate based on type of problem/error identified	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	EPA has approved use of CAP88-PC version 2.0 for demonstrating compliance with 40 CFR 61.93 (a) NESHAPs subpart H-emissions of Radionuclides Other than Radon from Department of Energy Facilities.	For background and assistance from the Hanford software authors visit the following website. http://www.pnl.gov/eshs/software/genii.html	None

Washington TRU Solutions Software Inventory (Cont.)

A. SoftwareName/Version	**MetData Application Version 4/2003**	**RadClient/Radnet Version RadclaJ1**	**Lpu02 af.exe Version af**
B. Function of Code	Converts the onsite meteorological data into stability array (STAR) format that is part of required input for the CAP88-PC in order to calculate the effective dose equivalent resulting from normal operations conducted at WIPP to the maximally exposed individual.	Software for remote monitoring/control of RADOS Radiation Monitoring System	Controls the Area Radiation Monitor Local Processing Unit. Receives communications from all the other ARMs which use Local Control Units
C. Application	Applied to Environmental monitoring and reporting at the WIPP site.	Applied to Environmental monitoring and reporting at the WIPP site.	Applied to Environmental monitoring and reporting at the WIPP site.
D. Code Developer/Sponsor	H. Chiou D. Kump	R. Sanchez R. Elmore	R. Sanchez T. Burrington
E. Commercial, Proprietary, or Other (explain)	Commercial	Proprietary (supplied by vendor with monitoring equipment)	Proprietary (supplied by vendor with monitoring equipment)
F. Current Owner/ Vendor and Technical Support Provider	H. Chiou D. Kump	R. Sanchez R. Elmore	R. Sanchez T. Burrington
G. Documentation Available	User Manuals and Design Documentation	User Manuals and Design Documentation	User Manuals and Design Documentation
H. Code Platform (Workstation, PC-based, Mainframe)	Desktop PC	Desktop PC	Monitoring Equipment
I. Operating System (Windows, DOS, Other)	Windows NT	W98/2000	Windows 98
J. Frequency of Use (Routine, repeated use, code of choice - R;Occasional Use - O;)	Daily	Daily	Daily
K. How are Error and User Questions Reported?	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	None	None	None

Washington TRU Solutions Software Inventory (Cont.)

A. SoftwareName/Version	**Lpu 022ab.exe Version ab**
B. Function of Code	Controls the Area Radiation Monitor Local Processing Unit.
C. Application	Applied to Environmental monitoring and reporting at the WIPP site.
D. Code Developer/Sponsor	R. Sanchez T. Burrington
E. Commercial, Proprietary, or Other (explain)	Proprietary (supplied by vendor with monitoring equipment)
F. Current Owner/ Vendor and Technical Support Provider	R. Sanchez T. Burrington
G. Documentation Available	User Manuals and Design Documentation
H. Code Platform (Workstation, PC-based, Mainframe)	Monitoring Equipment
I. Operating System (Windows, DOS, Other)	Windows 98
J. Frequency of Use (Routine, repeated use, code of choice - R;Occasional Use - O;)	Daily
K. How are Error and User Questions Reported?	Contact Mr. Peter Damm with WTS software quality assurance and vendor based on classification of problem or error.
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	None

Department of Energy/Office of Environmental Management

Waste Isolation Pilot Plant

Sandia National Laboratories

Sandia National Laboratories
Software Inventory

Area of Applicability	Software Name	Version	Date	Note
Civil/Structural/Geotechnical Systems	NONE			
Mechanical Systems	NONE			
HVAC	NONE			
Electrical Systems	NONE			
Fire Protection Systems	NONE			
Instrumentation and Control	NONE			
Others (not included above) NOTE: These codes are used to model the performance of the WIPP repository. They contain information related to the radioactivity characteristics of the waste interred in the repository but the software is not used for safety related reporting or reference.	ALGEBRACDB BLOTCDB\ BRAGFLO CCD2STEP CCDFCALC CCDFGF CCDFSUM CUTTINGS_S DTRKCDB	2.35 1.37 4.1 1.08 4.29 3.01 2.00 5.04 1.00	1/13/1996 6/4/1996 5/8/1997 3/22/1996 3/6/1996 8/12/1997 12/13/1996 7/9/1997 2/18/2002	
	DTRKMF	1.00	9/23/2002	
	EPANUI	1.14	10/4/1996	
	EQ3/6	7.2c	8/28/1996	Acquired
	FMT	2.4	9/3/1998	
	GENMESH	6.08	1/31/1996	
	GRASP-INV	2.01	4/26/1996	
	GROPECDB	2/12	6/27/1996	
	ICSET	2.22	2/5/1996	
	Kt3d	2.0	10/4/2002	Acquired
	LHS	2.41	3/6/1996	
	LHS2STEP	1.04	4/19/1996	
	MATSET	9.10	11/29/2001	
	MODFLOW 2K	1.6	3/5/2003	Acquired
	NONLIN	2.0	8/23/1996	
	nSIGHTS	1.0	5/14/2002	Acquired
	NUCPLOT	1.2	2/27/2002	
	NUTS	2.05	5/30/1997	
	ORIGEN2	2.2	7/1/2002	Acquired
	PANEL	3.60	5/17/1996	
	PAPDB	1.0	11/15/2001	
	PATTRN	1.00	3/15/1999	Acquired
	PCCSRC	2.21	5/23/1996	
	PEST	5.51	4/3/2003	Acquired

Sandia National Laboratories
Software Inventory

Area of Applicability	Software Name	Version	Date	Note
	POST_EPAUNI PSOTBRAG	1.15 4.0	9/18/1997 2/6/1996	
	POSTLHS	4.07	2/7/1996	
	POSTSECOFL2D	4.04	4/23/1996	
	POSTSECOTP2D	1.04	6/5/1997	
	PREBRAG	6.0	2/6/1996	
	PRELHS	2.30	11/27/2001	
	PRESECOFL2D	4.05	6/11/1996	
	PRESECOTP2D	1.22	6/12/1997	
	RELATE	1.43	3/6/1996	
	SANTOS	2.0	7/29/1996	
	SECOFL2D	3.03	5/7/1996	
	SECOTP2D	1.41a	7/9/2003	
	SGSIM	2.0	7/5/2002	Acquired
	SPLAT	1.02	10/2/1996	
	STAMMT-L	1.0	2/22/2002	
	STAMMT-R	1.0	6/25/1998	
	STEPWISE	2.21	12/2/1996	
	SUMMARIZE	2.20	7/11/1997	
	SWIFT 2	2F	N/A	
	TOUGH28W	2.00	3/3/1997	
	TRACKER	5.02	7/15/1997	
	TWBID	3.11	4/14/2003	

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	ALGEBRACDB Version 2.35	BLOTCDB Version 1.37	BRAGFLO Version 4.1
B. Function of Code	Used to algebraically manipulate data in CAMDAT	Used to plot the mesh and results from finite-element and finite-difference analysis programs	Used to study two-phase (brine and gas), three-dimensional isothermal flow in porous media
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	CCD2STEP Version 1.08	CCDFCALC Version 4.29	CCDFGF Version 3.01
B. Function of Code	CCD2STEP reads CCDFCALC files containing radionuclide release data for the dependent variables and writes an output file for either STEPWISE or PCCSRC	CCDFCALC calls for and collects specific radionuclide release data calculated by various WIPP PA codes designed to estimate such releases (e.g., CUTTINGS, PANEL, SECOTP2D, etc.). The release data are scenario specific and are normally provided in CAMDAT format (CDB) files	Assemble WIPP PA codes results to produce the CCDF specified in 40 CFR 191. Allow brine in the Castile Formation to be specified as input. Construct the distribution of CCDFs.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	CCDFSUM Version 2.00	CUTTINGS_S Version 5.04	DTRKCDB Version 1.00
B. Function of Code	Used to graphically display complementary cumulative distribution functions (CCDFs) constructed by the software CCDFGF	Used to estimate the quantity (in Curies) of wastes brought to the surface as a result of an inadvertent borehole drilled directly over the WIPP repository so as to penetrate a waste panel	Used to track the pathway of particles released in a fluid velocity field.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	DTRKMF Version 1.00	EPANUI Version 1.14	EQ3/6 Version 7.2c
B. Function of Code	N/A	Used to concur with the EPA standards, build a data set for the probability distribution for the volumetric EPA Unit	Used for speciation-solubility and reaction path calculation of aqueous system.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	FMT Version 2.4	GENMESH Version 6.08	GRASP-INV Version 2.01
B. Function of Code	Used to calculate chemical equilibrium in high-ionic-strength geochemical systems at 25°C.	Used to generate three-dimensional finite-difference mesh	Used to solve the inverse problem of groundwater flow for an ensemble of transmissivity fields
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
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Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	GROPECDB Version 2/12	ICSET Version 2.22	Kt3d Version 2.0
B. Function of Code	Used to examine CAMDAT file. It allows a user to interactively look at the contents of CAMDAT Database (CDB) file.	Used to set initial conditions in a PA Computational Data Base (CDB) file in 1-D, 2-D, or 3-D	A GSLIB kriging program Kt3d is used to estimate the residual values at all points on the grid within a model domain.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
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Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	LHS Version 2.41	LHS2STEP Version 1.04	MATSET Version 9.10
B. Function of Code	Used to perform Latin Hypercube Sampling	LHS2STEP reads an LHS sampled output file containing the independent variables, and writes an output file for either the STEPWISE or PCCSRC codes.	Used to set material and properties in CAMDAT
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	MODFLOW 2K Version 1.6	NONLIN Version 2.0	nSIGHTS Version 1.0
B. Function of Code	A three-dimensional finite-difference ground-water model used to perform ground water hydrology simulation. MODFLOW2k also has capabilities such as solute transport and parameter estimation.	N/A	nSights consists of a numeric simulator, analytic routines that support standard well-test interpretation methodologies, and statistical sampling/optimization and post-processing procedures that enable the analyst to quantify uncertainty in parameter estimates
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
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Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	NUCPLOT Version 1.2	NUTS Version 2.05	ORIGEN2 Version 2.2
B. Function of Code	Used to plot output data from the modeling codes	Used to simulate radioisotope transport through porous media and includes first-order radioactive decay processes.	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
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Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	PANEL Version 3.60	PAPDB Version 1.0	PATTRN Version 1.00
B. Function of Code	PANEL takes brine flow and repository volume data and computes the amount of mobilized radioisotopes that leave the repository.	The performance assessment parameter database.	Used to detect patterns in scatterplots of independent variables versus dependent variables and used as an additional sensitivity analysis tool to aid in identifying important independent variables.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	PCCSRC Version 2.21	PEST Version 5.51	POST_EPAUNI Version 1.15
B. Function of Code	Used to evaluate parameter importance by reporting the partial correlation coefficients (PCCs) and standardized regression coefficients (SRCs) on either the raw or ranked data	Used as a "model-independent parameter estimator" and optimizes parameters pertaining to an existing simulation model, such that the outputs of that model are as well matched as possible to a set of field measurements.	Post-processor of output from EPAUNI to CAMDAT
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	PSOTBRAG Version 4.0	POSTLHS Version 4.07	POSTSECOFL2D Version 4.04
B. Function of Code	Post-processor (translator) of output from BRAGFLO to CAMDAT	Post-processor (translator) of output from LHS to CAMDAT	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	POSTSECOTP2D Version 1.04	PREBRAG Version 6.0	PRELHS Version 2.30
B. Function of Code	Post-processor of output from SECOTP2D to CAMDAT	Pre-processor (translator) for input to BRAGFLO	Pre-processor (translator) for input to LHS
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
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Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	PRESECOFL2D Version 4.05	PRESECOTP2D Version 1.22	RELATE Version 1.43
B. Function of Code	Pre-processor for input to SECOTP2D	N/A	Used to transfer information from one CAMDAT database file (the "Reference" database) to another CAMDAT database file (the "Object" database)
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	SANTOS Version 2.0	SECOFL2D Version 3.03	SECOTP2D Version 1.41a
B. Function of Code	The quasistatic, large deformation finite element code with a multi-mechanism deformation to model the creep behavior of rock salt.	Performs single and multiple component radionuclide transport in fractured aquifers, calculate the discharge across a user defined boundary.	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	SGSIM Version 2.0	SPLAT Version 1.02	STAMMT-L Version 1.0
B. Function of Code	A GSLIB utility used for creating realizations by performing (Sequential Gaussian Simulation) conditional stochastic Gaussian geostatistical. simulations	Used for X-Y plot. It reads data for ASCII files generated by SUMMARIZE.	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	STAMMT-R Version 1.0	STEPWISE Version 2.21	SUMMARIZE Version 2.20
B. Function of Code	Used for ground-water transport simulation	Used for stepwise regression analysis	Data integration and conversion utility code for the analysis of binary input data. SUMMARIZE reads specific data from a series of CAMDAT binary CDB data files and generates a tabular ASCII output file or files.
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	SWIFT 2 Version 2F	TOUGH28W Version 2.00	TRACKER Version 5.02
B. Function of Code	N/A	N/A	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad	SRS Carlsbad	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS	Windows and/or VMS	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Sandia National Laboratories
Software Inventory

A. SoftwareName/ Version	TWBID Version 3.11
B. Function of Code	N/A
C. Application	Modeling of the WIPP waste repository physical characteristics
D. Code Developer/Sponsor	SRS Carlsbad
E. Commercial, Proprietary, or Other (explain)	Proprietary
F. Current Owner/ Vendor and Technical Support Provider	SRS Carlsbad
G. Documentation Available	Full Software Life-Cycle Development Documentation Suite Per NQA 2.7
H. Code Platform (Workstation, PC-based, Mainframe)	Mainframe, accessed from server workstations
I. Operating System (Windows, DOS, Other)	Windows and/or VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R
K. How are Error and User Questions Reported?	Sandia Procedure NP 19-1 implementing NQA Part 2 section 2.7 requirements
L. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Software is used to model the physical waste repository but does not contain data and/or is not used to report release to the atmosphere or impact to the public.

Department of Energy/Office of Radioactive Waste Management

Yucca Mountain Project

2. Survey Information Prepared By

Name(s):	Roy D. Capshaw
Organization(s):	OCRWM/OQA
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Address:	1551 Hillshire Drive, Suite A, Las Vegas, NV 89134
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Principal DOE organization(s) supported (NNSA, EM, NE, etc.)	RW1
Date Survey Form Submitted:	11/05/2003

3. Design Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SS SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Attach additional sheets if needed.

Area of Applicability	**Computer Software Name***
Civil/Structural/Geotechnical Systems	MACCS2
Mechanical Systems	*
HVAC	*
Electrical Systems	*
Fire Protection Systems	*
Instrumentation and Control	
Others (not included above)	*Early stages of SAR development
	therefore many S/W selections
	have not been made to date

*Enter "None" if no safety software is applicable to the area.

4. Safety Software Information

For each safety software application identified in Section 3, provide the information requested below. Attachment 1 is provided as an example. For additional assistance, email questions to sqa@eh.doe.gov.

a.	Code Name and Version	MACCS 2 V 1.12
b.	Function of Code	Gaussian Dispersian Analysis
c.	Application (what projects/facilities at the site/lab)	SAR for NRC Approval
d.	Code developer and/or sponsor	M. L. Young and D.I. Chanin Sandia National Laboratory
e.	Commercial, Proprietary, or Other (explain)	Limited Use controlled by Sandia National Laboratory
f.	Current Owner/Vendor and technical support provider	Sandia National Laboratory
g.	Documentation available	Yes, www.nea.fr/abs/html/ccc-0652.html
h.	Code Platform (Workstation, PC-based, Mainframe)	IBM PC and other platforms
i.	Operating System (Windows, DOS, other)	DOS IBM PC 80486 or Pentium 8 MB RAM 30 MB hard disk space
j.	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O;)	Routine
k.	How are error and user questions reported?	to Sandia
k.	Comments on experience with this computer software, ease of application, documentation provided, known errors or issues	None

5. Other Information on Your Oerganization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA Programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software? **OCRWM Quality Assurance requirements and description**

Document title(s) and report number(s): **Quality Assurance requirements and description DOE/RW-0333P Revision 13 (NRC approved)**

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	Standard/Rule/DOE or Other Directive
Uncertain	a. 10CFR 830, Subpart A, Quality Assurance Requirements
Yes	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
Uncertain	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems - Requirements, or Related Standards
Uncertain	d. DOE Order 414.1, *Quality Assurance*
Uncertain	e. DOE Order 420.1, *Facility Safety*
Uncertain	f. DOE Order 200.1, *Information Management Program*
Uncertain	g. DOE Guide 200-1-1, *Department of Energy Software Engineering Methodology*
Uncertain	h. DOE Guide 414.1-1, Assessment Guide for QA
Uncertain	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
Yes	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify) (10 CFR50, appendix b) 10 CFR63.144 Quality Assurance Program Change

5.3 How do you apply QA procedures to safety software? Through CFR requirements DOE/OCRWM requirements and specified standards

5.4 How do you train users on safety software? There is no formal training program users have years of experience prior to hiring or use. Program manuals during on-the-job training

Department of Energy/Office of Nuclear Energy, Science, and Technology

Argonne National Laboratory - West

ANL-W Survey of Safety Software

The following information is provided in response to a request by the Argonne Area Office – West to complete a survey requested by the DOE. This includes safety software currently used to support the analysis and design of defense nuclear facilities including structures, systems and components, as well electrical and control system design. Although ANL-W does not currently have *defense* nuclear facilities, it is responding to the survey just the same. This includes a request for information regarding SQA programs, procedures and training.

It is understood that the Office of Environment, Safety and Health (EH) will review the information for applicability as 'toolbox' codes; an effort in response to Defense Nuclear Facilities Safety Board Recommendation 2002-01, *Quality Assurance for Safety-Related Software* to in essence provide a central toolbox of safety codes used within the DOE complex.

Survey Information Prepared By

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Organization(s):	Argonne National Laboratory- West
Address:	PO Box 2528, Idaho Falls, ID 83403
Phone/email/facsimile:	(208) 533-7088 / Deborah.tate@anl.gov (208) 533-7471
Principle DOE Organization(s) Supported:	NE
Date Survey Form Submitted:	November 6, 2003

1. Design Safety Software

A list of safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) at ANL-W is provided in the table below. Detailed information on each of the individual applications is provided in attachment 1.

Table 1 – ANL-W Safety Software

Area of Applicability	Computer Software Name*
Civil/Structural/Geotechnical Systems	SAP2000 Nonlinear
	ALGOR
Mechanical Systems	ALGOR
HVAC	None
Electrical Systems	None
Fire Protection Systems	HASS
Instrumentation and Control	DMT
	ARCS
Others (not included above)	Microshield

* Enter "None" if no safety software in applicable the area.

2. ANL-W's Software Quality Assurance Program

2.1 Documented SQA Programs and Procedures

ANL-W applies a graded approach for developing, testing, documenting, maintaining and applying all software, regardless of its use. Two main procedures document this process and they are as follows. In addition, individual formal documents prescribe procedures and requirements that are unique to a given software system. For each code listed in table 1 above, these types of documents are also listed in Attachment 1.

Document title(s) and report number(s):

- AWP 4.9, *Software Quality Assurance*
- AWP 2.9, *Engineering Procedure*

2.2 ANL-W SQA Procedure Compliance

Table 2 – ANL-W SQA Procedure Compliance List

Yes/No/Uncertain	**Standard/Rule/DOE or Other Directive**
Y	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
Y	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
N	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Y	d. DOE Order 414.1, *Quality Assurance*
Y	e. DOE Order 420.1, *Facility Safety*
Y	f. DOE Order 200.1, *Information Management Program*
Y	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
Y	h. DOE Guide 414.1-1, Assessment Guide for QA
U	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
U	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines

2.3 Application of SQA Procedures To Safety Software

As part of good business practice, the version being used is verified to be the latest version available from the vendor. All analyses are checked; however, this only ensures that the software was used correctly, not that the software works correctly.

2.4 Software Training

Engineers familiar with the software train other engineers. The tutorials available for the program are also used.

Point of Contact: Brent Harris		**Phone**: (208) 533-7996
a.	Code name and version	**SAP2000 Nonlinear, Version 8.1.6**
b.	Function of code	Structural Analysis and Design
c.	Application (what projects/facilities at the site/lab)	Used routinely for structural analysis of facilities and equipment at the Laboratory.
d.	Code developer and/or sponsor	Computers and Structures, Inc. 1995 University Ave., Suite 540 Berkeley, CA 94704 Phone: 510-845-2177 e-mail: info@csi.berkeley.com
e.	Commercial, Proprietary or Other	C; Individual User Licenses & Maintenance Agreements
f.	Current Owner/Vendor and technical support provider	Same as (d) above. Technical support is included as part of maintenance agreement.
g.	Documentation available	Users Manual; Verification Problem Manual
h.	Code platform	PC-based
i.	Operating System	Windows XP, NT
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	A website exists for reporting software problems via e-mail; problems can also be reported by telephone.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Experience over the past several years has been quite good. The program is relatively user-friendly; however some problems have been encountered. The problems are usually resolved in periodic program updates issued by the vendor.

SQA/V&V: The vendor does not have an SQA/V&V program for structural evaluations that address safety issues. The vendor does maintain a verification manual that provides comparisons between SAP2000 solutions and theoretical solutions for a wide variety of problems using different element and analysis types. ANL-W has a current maintenance agreement for this software.

Training: Self-taught, user manuals and tutorials.

Point of Contact: Ken Durstine		**Phone**: (208) 533- 7492
a.	Code name and version	**ALGOR FEMPRO, Version 14.02**
b.	Function of code	Finite element code used for stress and heat transfer analysis.
c.	Application (what projects/facilities at the site/lab)	Equipment and structural analysis, used to verify adequacy of design. All facilities and projects needing this type of analysis.
d.	Code developer and/or sponsor	ALGOR Inc. 150 Beta Drive, Pittsburgh, PA.
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	ALGOR Inc., technical support provided under maintenance agreement
g.	Documentation available	Software based owners manual, tutorials, verification examples
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation /PC
i.	Operating System (Windows, DOS, other)	Windows XP
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Routine
k.	How are error and user questions reported?	Via email to customer support, electronic notice when updates are available, QA subscription available.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Vendor continuously updates capabilities and features of software.

SQA/V&V: Performed by vendor; vendor QA program satisfies 10CFR 50, App. B, 10 CFR 21, & ISO- 9001. ANL-W has a current maintenance agreement for this software.

Training: Self-taught, user manuals and tutorials.

Point of Contact: Doug Ray		**Phone**: (208) 533-7800
a.	Code name and version	**DMT**
b.	Function of code	Supports daily certification of the TREAT Reactor Trip Systems (RTS).
c.	Application (what projects/facilities at the site/lab)	Transient Reactor Test Facility (TREAT)
d.	Code developer and/or sponsor	ANL-W
e.	Commercial, Proprietary or Other (Explain)	O – Code not in use at this time.
f.	Current Owner/Vendor and technical support provider	ANL-W
g.	Documentation available	
h.	Code platform (Workstation, PC-based, Mainframe)	
i.	Operating System (Windows, DOS, other)	
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	Software is not currently active, however it will be placed back in service when the final decision is made regarding TREAT restart.
k.	How are error and user questions reported?	Errors/user questions reported to the facility manager.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This code is a series of modules that run on a number of processors to support daily certification of the TREAT Reactor Trip System (RTS).

SQA/V&V: Software is controlled under the TREAT Software configuration Control Procedure (SQA No: Z0006-0004-OP). It is validated using the DMT Fault Detection System Test Procedure (L6570-8372-DA)

Training: In addition to formal educational backgrounds in computer science, electrical engineering and mathematics, this code is still maintained by one of the original code developers.

Point of Contact: Doug Ray		**Phone**: (208) 533-7800
a.	Code name and version	**ARCS**
b.	Function of code	Supports daily operation of the TREAT Reactor Control System.
c.	Application (what projects/facilities at the site/lab)	Transient Reactor Test Facility (TREAT)
d.	Code developer and/or sponsor	ANL-W
e.	Commercial, Proprietary or Other (Explain)	O – Code not in use at this time.
f.	Current Owner/Vendor and technical support provider	ANL-W
g.	Documentation available	
h.	Code platform (Workstation, PC-based, Mainframe)	
i.	Operating System (Windows, DOS, other)	
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	This code is a series of modules that run on the various processors that form the TREAT Automatic Reactor Control System
k.	How are error and user questions reported?	Errors/user questions reported to the facility manager.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This code is a series of modules that run on a number of processors to support daily certification of the TREAT Reactor Trip System (RTS).

SQA/V&V: Software is controlled under the TREAT Software configuration Control Procedure (SQA No: Z0006-0004-OP). It is validated using the ARCS Reference Transient Test Procedure (Z0003-0150-OP Appendix D)

Training: In addition to formal educational backgrounds in computer science, electrical engineering and mathematics, this code is still maintained by one of the original code developers.

Point of Contact: Paul Hart or Mike Lehto		**Phone**: (208) 533-7319, (208) 533-7295
a.	Code name and version	**MicroShield, Version 6**
b.	Function of code	MicroShield is a photon/gamma ray shielding and dose assessment program used for designing shields, estimating source strength from radiation measurements, minimizing exposure to people, and teaching shielding principles.
c.	Application (what projects/facilities at the site/lab)	It is used for DTRA Training, source materials handling and HP field measurements.
d.	Code developer and/or sponsor	Grove Engineering 1700 Rockville Pike, Suite 525 Rockville, MD 20852 (301) 231-5137
e.	Commercial, Proprietary or Other	C; Individual User Licenses & Maintenance Agreements
f.	Current Owner/Vendor and technical support provider	Mike Lehto or Paul Hart. Technical support is included as part of maintenance agreement.
g.	Documentation available	Users Manual
h.	Code platform	PC-based
i.	Operating System	Windows XP, NT
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	A website exists for reporting software problems via e-mail; problems can also be reported by telephone.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

SQA/V&V: Performed by vendor, vendor QA program satisfies 10CFR50 App. B as well as ASME NQA 2a-1990, Part 2.7

Training: Attendance a formal course in addition to user manuals and tutorials.

Point of Contact: Roy Nelson		**Phone**: (208) 533-7576
a.	Code name and version	**HASS, Version 7.5**
b.	Function of code	HASS (**H**ydraulic **A**nalyzer of **S**prinkler **S**ystems) is used to determine water supply adequacy based on system demand and distribution piping, hydraulic analysis in accordance with NFPA 13, and calculation of any connection of nodes and pipes.
c.	Application (what projects/facilities at the site/lab)	ANL-W has a current maintenance agreement for this software. It is used for any new or to be modified ANL-W buildings.
d.	Code developer and/or sponsor	HRS Systems Inc. 4792 LaVista Rd Tucker, Georgia 30084
e.	Commercial, Proprietary or Other	C; Individual User Licenses & Maintenance Agreements
f.	Current Owner/Vendor and technical support provider	Roy Nelson. Technical support is included as part of maintenance agreement.
g.	Documentation available	Users Manual
h.	Code platform	PC-based
i.	Operating System	Windows XP, NT
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	A website exists for reporting software problems via e-mail; problems can also be reported by telephone.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

SQA/V&V: The vendor has no specific SQA. Vendor provides comparisons with known calculations from previous versions and examples with NFPA 13.

Training: Self-taught; manuals and tutorials, University of Idaho classroom instruction.

Department of Energy/Office of Nuclear Energy, Science, and Technology

Idaho National Engineering and Environmental Laboratory

2. Survey Information Prepared By

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Organization(s):	**NE-ID**
Site or Laboratory:	**INEEL**
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Phone/email/facsimile:	**Phone 208-526-1181,** **email blythrl@id.doe.gov** **fax 2088-526-0160**

Principal DOE organization(s) supported (NNSA, EM, NE, etc.) Lead PSO NE

Date Survey Form Submitted: 10/31/03

3. Design Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Attach additional sheets if needed.

Area of Applicability	Computer Software Name*
Civil/Structural/Geotechnical Systems	None
Mechanical Systems	None
HVAC	None
Electrical Systems	None
Fire Protection Systems	None
Instrumentation and Control	None
Others (not included above)	See section 4

4. Safety Software Information

For each safety software application identified in Section 3, provide the information requested below. Attachment 1 is provided as an example. For additional assistance, email questions to sqa@eh.doe.gov.

a.	Code name and version	Radiological Safety Analysis Computer (RSAC) Program, Versions 5 and 6
b.	Function of code	Dose consequences due to an airborne radiological release for the inhalation, ingestion, ground deposition and direct dose pathways.
c.	Application (what projects/facilities at the site/lab)	Accident analysis for nuclear facility safety basis and the selection of safety SSCs and TSR-level controls. Used on all INEEL nuclear facility safety analysis.
d.	Code developer and/or sponsor	Bechtel BWXT Idaho, LLC (BBWI)
e.	Commercial, Proprietary or Other (Explain)	Proprietary (copyright protected)
f.	Current Owner/Vendor and technical support provider	DOE (NE-ID)/BBWI/Radiological Engineering
g.	Documentation available	RSAC and 5.0 and 6.0 User's Manuals V&V files maintained on the INEEL Enterprise Architecture system (Tracking numbers 69132 and 121980)
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Microsoft Windows 98/XP/NT
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	RSAC Web page http://www.inel.gov/rsac/
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	As of August 27, 2002 the INEEL has released RSAC 6.2 with WinRp 1.2. WinRp is our new windows interface for RSAC. The new interface is very user-friendly, provides more options and greatly increases the versatility of the program. With the addition of Run History and a new Run Output window, version 1.2 allows the user to easily find the data of interest.

a.	Code name and version	MicroShield 5.0 and 6.0
b.	Function of code	Evaluates shielding and direct doses.
c.	Application (what projects/facilities at the site/lab)	Accident analysis for nuclear facility safety basis and the selection of safety SSCs and TSR-level controls. Used on all INEEL nuclear facility safety analysis.
d.	Code developer and/or sponsor	Grover Engineering
e.	Commercial, Proprietary or Other (Explain)	Commercial, site wide licenses for 5.05 and 6.0
f.	Current Owner/Vendor and technical support provider	Grover Engineering
g.	Documentation available	Micro Shield 5.0 and 6.0 User's Manuals V&V files maintained on the INEEL Enterprise Architecture system (Tracking numbers 64335 and 121983)
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Microsoft Windows 98/XP/NT
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Grover Engineering via INEEL Radiological Engineering group, which controls the site wide license.
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Software is user friendly with input screens for required data. User must be familiar with shielding design and analysis to use the code. User manuals are ok, but not clear.

a.	Code name and version	ORIGEN2 Version 2.1
b.	Function of code	ORIGEN2 is designed to calculate the composition and characteristics of nuclear materials as a function of decay time and the changes the materials undergo during various fuel cycle operations.
c.	Application (what projects/facilities at the site/lab)	Used across the Site to calculate fission product inventories.
d.	Code developer and/or sponsor	Oak Ridge National Laboratory
e.	Commercial, Proprietary or Other (Explain)	O (available within DOE, but also sold outside of DOE)
f.	Current Owner/Vendor and technical support provider	Oak Ridge National Laboratory
g.	Documentation available	1. User's Manual 2. Test Problems – Input and Output Files
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	This has not been an issue with our use at INEEL. Any questions/issues would be addressed to RSIC at Oak Ridge National Laboratory
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	An effective tool for its purpose.

a.	Code name and version	SCALE, Version 4.3
b.	Function of code	SCALE is used to calculate k-eff (eigenvalue) for systems that contain fissile material.
c.	Application (what projects/facilities at the site/lab)	Criticality safety analysis for all INEEL nuclear facilities.
d.	Code developer and/or sponsor	Oak Ridge National Laboratory
e.	Commercial, Proprietary or Other (Explain)	SCALE is in public domain and distributed by Radiation Safety Information Computational Center
f.	Current Owner/Vendor and technical support provider	Oak Ridge National Laboratory
g.	Documentation available	3. SCALE User's Manual 4. Test Problems – Input and Output Files
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation-based
i.	Operating System (Windows, DOS, other)	HP-UX 10.20 and 11.0
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	SCALE Homepage http://www.ornl.gov/scale/scale-home.html
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Newer Version, SCALE 5 will be available in December, 2003. Used to compare with MCNP results.

a.	Code name and version	MCNP, Version 4B
b.	Function of code	MCNP is used to calculate k-eff (eigenvalue), neutron and gamma ray flux/dose for systems that contain fissile material.
c.	Application (what projects/facilities at the site/lab)	Criticality safety analysis and radiation dose evaluation for all INEEL nuclear facilities.
d.	Code developer and/or sponsor	Los Alamos National Laboratory
e.	Commercial, Proprietary or Other (Explain)	MCNP is in public domain and distributed by Radiation Safety Information Computational Center
f.	Current Owner/Vendor and technical support provider	Los Alamos National Laboratory
g.	Documentation available	5. MCNP4B User's Manual 6. Test Problems – Input and Output Files
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation-based
i.	Operating System (Windows, DOS, other)	HP-UX 10.20 and 11.0
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Forum for MCNP Users http://laws.lanl.gov/x5/MCNP/forum.html
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Newer Versions, 4C and 5 are available, but we have to have software quality assurance plan before using it.

a.	Code name and version	DANTSYS, Version 4.3
b.	Function of code	DANTSYS is used to calculate k-eff (eigenvalue) for fissile system.
c.	Application (what projects/facilities at the site/lab)	Criticality safety analysis for all INEEL nuclear facilities.
d.	Code developer and/or sponsor	Los Alamos National Laboratory
e.	Commercial, Proprietary or Other (Explain)	DANTSYS is in public domain and distributed by Radiation Safety Information Computational Center
f.	Current Owner/Vendor and technical support provider	Los Alamos National Laboratory
g.	Documentation available	7. DANTSYS User's Manual 8. Test Problems – Input and Output Files
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation-based
i.	Operating System (Windows, DOS, other)	HP-UX 10.20 and 11.0
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Los Alamos National Laboratory
k.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	PARTISN, a successor to DANTSYS is available. Occasionally is used to compare k-eff against MCNP and SCALE results.

5. Other Information on Your Organization's Software Quality Assurance Program (Optional)

Please take a moment to provide this additional information regarding your SQA programs, procedures, and training.

5.1 What documented SQA programs and procedures do you follow for developing, testing, documenting, maintaining, and applying safety software? PRD-5074, PRD-5092, PRD-112 and MCP-3039, MCP-550

Document title(s) and report number(s):
PRD-5074, "Design Control"
PRD-5092, "Software Quality Assurance"
PRD-112, "Program Requirements Document for the Criticality Safety Program Requirements Manual"
MCP- 550, "Software Management"
MCP-3039, " Analysis Software Control"

5.2 Do your procedures comply in whole or in part with (check compliance)?

Yes/No/Uncertain	Standard/Rule/DOE or Other Directive
Yes	a. 10 CFR 830, Subpart A, Quality Assurance Requirements
Yes to ASME NQA-1-1997	b. ASME NQA-1a-1999, NQA-1a-2000 (Part 2.7); or predecessor (indicate which)
Yes	c. ANSI/ISO/ASQ Q9001-2000, Quality Management Systems – Requirements, or Related Standards
Yes	d. DOE Order 414.1, *Quality Assurance*
Uncertain	e. DOE Order 420.1, *Facility Safety*
Yes	f. DOE Order 200.1, *Information Management Program*
No	g. DOE Guide 200.1-1, *Department of Energy Software Engineering Methodology*
Uncertain	h. DOE Guide 414.1-1, Assessment Guide for QA
Uncertain	i. ANSI/ANS-10.4-1987, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*
Uncertain	j. Other DOE, National, International, or Industry Standards, Requirements, or Guidelines (Please identify)

5.3 How do you apply QA procedures to safety software? Through company level procedures (i.e., PRDs, MCPs, etc.) See item 5.1

5.4 How do you train users on safety software? Formal training, and on the job experience under the direction of a qualified code user.

Department of Energy/Office of Nuclear Energy, Science, and Technology

Oak Ridge National Laboratory

SURVEY OF DESIGN SOFTWARE CODES

Survey Information Prepared By

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Organization(s):	Operational Safety Services Division
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Principal DOE Organization(s) supported:	SC
Date Survey Form Submitted:	January 9, 2004

Design Safety Software

List the safety software that is used to support the analysis and design of safety-class structures, systems, and components (SC SSCs) and safety-significant structures, systems, and components (SS SSCs) for DOE defense nuclear facilities.

Area of Applicability	Computer Software Name*
Civil/Structural/Geotechnical Systems	GTSTRUDL, ABAQUS, PATRAN, STAADPRO
Mechanical Systems	ALGOR, RELAP5, HEATING7, ATHENA, CFX, FLUENT, FEMLAB, ICEM-CFD, CAESAR II
HVAC	None
Electrical Systems	POWERTOOLS
Fire Protection Systems	HASS, SSAMS
Instrumentation and Control	None
Others (not included above)	SCALE, DOORS-DORT, MCNP, REBUS, ATTILA, VENTURE, MICROSHIELD, MCNPX, HETC, ORIHET95, CINDER90

** Enter "None" if no safety software in applicable the area.*

Safety Software Information

GTSTRUDL 3
ABAQUS 4
PATRAN 5
ALGOR 6
RELAP5 7
HEATING7 8
ATHENA 9
CFX 10
FLUENT 11
FEMLAB 12
ICEM-CFD 13
CAESAR II 14
POWERTOOLS 15
HASS 16
SSAMS 17
SCALE 18
DOORS-DORT 19
MCNP 20
REBUS 21
ATTILA 22
VENTURE 23
MICROSHIELD 24
MCNPX2.1.5 25
MCNPX2.4.0 26
HETC 27
ORIHET95 28
CINDER90 29
STAAD 30

a.	Code name and version	GT STRUDL Version 27
b.	Function of code	GT STRUDL is used in the structural analysis and design of nuclear and non-facilities and related structures.
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	Georgia Tech
e.	Commercial, Proprietary or Other (Explain)	Proprietary
f.	Current Owner/Vendor and technical support provider	Georgia Tech Research Corporation Atlanta, Georgia
g.	Documentation available	1. User's Manual 2. Software Model Description 3. Software Requirements Specification 4. Sample Problems- Input and Output
h.	Code platform (Workstation, PC-based, Mainframe)	PC based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	User questions are submitted via phone or website. Annual user meetings are used to highlight errors identified in the program.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Vendor provides various levels of training on this program.

a.	Code name and version	GT STRUDL Version 27
b.	Function of code	GT STRUDL is used in the structural analysis and design of nuclear and non-facilities and related structures.
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	Georgia Tech
e.	Commercial, Proprietary or Other (Explain)	Proprietary
f.	Current Owner/Vendor and technical support provider	Georgia Tech Research Corporation Atlanta, Georgia
g.	Documentation available	1. User's Manual 2. Software Model Description 3. Software Requirements Specification 4. Sample Problems- Input and Output
h.	Code platform (Workstation, PC-based, Mainframe)	PC based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	User questions are submitted via phone or website. Annual user meetings are used to highlight errors identified in the program.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Vendor provides various levels of training on this program.

a.	Code name and version	ABAQUS versions 6.3 & 6.4
b.	Function of code	Structural and Thermal Analysis Finite Element Code
c.	Application (what projects/facilities at the site/lab)	High Flux Isotope Reactor (HFIR), Spallation Neutron Source (SNS), ORNL nuclear facilities
d.	Code developer and/or sponsor	ABAQUS, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial & Proprietary
f.	Current Owner/Vendor and technical support provider	ABAQUS, Inc.
g.	Documentation available	On-line and user manual
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	ABAQUS, Inc.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This is an essential tool.

a.	Code name and version	PATRAN v2003
b.	Function of code	Structural and thermal analysis pre- and post-processor
c.	Application (what projects/facilities at the site/lab)	SNS
d.	Code developer and/or sponsor	MSC Software, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	MSC Software, Inc.
g.	Documentation available	On-line
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	Win2000, XP
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	By phone and e-mail
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	This is an essential tool.

a.	Code name and version	ALGOR
b.	Function of code	ALGOR is used for mechanical analysis and design.
c.	Application (what projects/facilities at the site/lab)	ORNL nuclear facilities
d.	Code developer and/or sponsor	ALGOR, Inc.
e.	Commercial, Proprietary or Other (explain)	Commercial
f.	Current Owner/Vendor and technical support provider	ALGOR, Inc.
g.	Documentation available	
h.	Code platform (workstation, PC-based, Mainframe)	PC - Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (routine, repeated use, code of choice = R; occasional use = O)	O
k.	How are error and user questions reported?	
l.	Comments on experience with this computer software, ease of application, documentation provided, known errors or issues.	

a.	Code name and version	RELAP5/Mod 3.3
b.	Function of code	Thermal-hydraulic system analysis
c.	Application (what projects/facilities at the site/lab)	HFIR/ORNL
d.	Code developer and/or sponsor	ISL Inc./NRC INEEL/DOE
e.	Commercial, Proprietary or Other (Explain)	Other, Government sponsored software
f.	Current Owner/Vendor and technical support provider	ISL/NRC
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	ISL/NRC
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

a.	Code name and version	HEATING7.3
b.	Function of code	Heat Conduction
c.	Application (what projects/facilities at the site/lab)	HFIR/SNS
d.	Code developer and/or sponsor	ORNL/DOE
e.	Commercial, Proprietary or Other (Explain)	Other, Government sponsored.
f.	Current Owner/Vendor and technical support provider	ORNL/DOE
g.	Documentation available	User manual
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	By phone and e-mail
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Simple code. Very useful for some specific situations. Well validated.

a.	Code name and version	ATHENA 3.1.1.2
b.	Function of code	Thermal-hydraulics with fluids other than water.
c.	Application (what projects/facilities at the site/lab)	Simulation of HFIR Cold Source
d.	Code developer and/or sponsor	INEEL/DOE
e.	Commercial, Proprietary or Other (Explain)	Other, Government sponsored.
f.	Current Owner/Vendor and technical support provider	Most likely INEEL
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

a.	Code name and version	CFX 4.2, 5.0, 5.5, 5.6
b.	Function of code	Fluid and thermal analysis, post-processor
c.	Application (what projects/facilities at the site/lab)	HFIR/SNS
d.	Code developer and/or sponsor	ANSYS, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial & Proprietary
f.	Current Owner/Vendor and technical support provider	ANSYS, Inc.
g.	Documentation available	On-line
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	ANSYS, Inc.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	User-validated against physical data. Heavily utilized.

a.	Code name and version	FLUENT
b.	Function of code	CFD Code
c.	Application (what projects/facilities at the site/lab)	HFIR/ORNL
d.	Code developer and/or sponsor	FLUENT, USA
e.	Commercial, Proprietary or Other (Explain)	Commercial & Proprietary
f.	Current Owner/Vendor and technical support provider	FLUENT, USA
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	FLUENT, USA
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

a.	Code name and version	FEMLAB 3.0
b.	Function of code	Simulation of physical systems using Finite Element (FE) methods
c.	Application (what projects/facilities at the site/lab)	HFIR/ORNL
d.	Code developer and/or sponsor	COMSOL
e.	Commercial, Proprietary or Other (Explain)	Commercial & Proprietary
f.	Current Owner/Vendor and technical support provider	COMSOL
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	All
i.	Operating System (Windows, DOS, other)	All
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	COMSOL
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Initial Use

a.	Code name and version	ICEM-CFD Hexa
b.	Function of code	Grid generation for structural, thermal, and fluid analysis
c.	Application (what projects/facilities at the site/lab)	SNS
d.	Code developer and/or sponsor	ANSYS
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	ANSYS
g.	Documentation available	On-line
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	Win2000, XP
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	By phone and e-mail
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Provides a way to rapidly generate hex grids. Heavily utilized.

a.	Code name and version	CAESAR II Version 4.0
b.	Function of code	Pipe Stress Analysis
c.	Application (what projects/facilities at the site/lab)	Various piping modifications/installation at HFIR
d.	Code developer and/or sponsor	COADE Engineering Software
e.	Commercial, Proprietary or Other (Explain)	
f.	Current Owner/Vendor and technical support provider	
g.	Documentation available	User Guide, applications manual, technical reference manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC
i.	Operating System (Windows, DOS, other)	
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	

a.	Code name and version	PowerTools 3.7.2.0.
b.	Function of code	Electrical power system modeling and analysis.
c.	Application (what projects/facilities at the site/lab)	Modeling and analysis of the HFIR electrical power distribution system.
d.	Code developer and/or sponsor	SKM Systems Analysis, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial.
f.	Current Owner/Vendor and technical support provider	SKM Systems Analysis, Inc.
g.	Documentation available	Detailed printed documentation from developer provided with software; printed documentation is updated with each new software revision.
h.	Code platform (Workstation, PC-based, Mainframe)	PC-Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Via email or telephone to provider. Some on-line help available on developer's web site.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Very powerful software with many features and available add-on modules. Initial installation can be troublesome, but software is stable during normal operation. Requires a hardware key (provided with software); can also be installed on a network. Recommend attending a factory training class to get the most from the features. Very good printed documentation.

a.	Code name and version	HASS®, Version 7.5
b.	Function of code	Performs Hydraulic Calculations for sprinkler systems
c.	Application (what projects/facilities at the lab)	Used to calculate/verify proposed changes to existing sprinkler systems at ORNL. Can also be used to verify vendor calculations.
d.	Code Developer and or sponsor	HRS Systems, Inc.
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	ORNL Fire Protection Engineering / HRS Systems, Inc.
g.	Documentation available	Owners Manual / Users Guide
h.	Code platform (Workstation, PC based, Mainframe)	PC Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
k	How are error and user questions reported?	HRS Systems, Inc.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	User friendly and is becoming the industry standard for performing sprinkler system hydraulic calculations.

a.	Code name and version	Safe Shutdown Analysis Management System (SSAMS) 1.0
b.	Function of code	Track and analyze safe shutdown electrical cables for nuclear power reactors.
c.	Application (what projects/facilities at the site/lab)	Used to track and analyze electrical cable routings for the HFIR fire safe shutdown analysis.
d.	Code developer and/or sponsor	Framatome ANP
e.	Commercial, Proprietary or Other (Explain)	Proprietary. Purchased from Framatome as part of an engineering consulting contract.
f.	Current Owner/Vendor and technical support provider	Owner: Research Reactors Division. Technical Support Provider: Framatome ANP.
g.	Documentation available	Printed user documentation from developer.
h.	Code platform (Workstation, PC-based, Mainframe)	PC-Based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Via email and telephone to support provider.
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	A Microsoft Access runtime application, this program is essentially a relational database. Very difficult to learn without instruction from the developer. Printed user documentation is provided but contains errors and omits critical details. Can be installed to run on a network. Several bugs were discovered during use and reported to developer. Once the data is entered, final output reports are useful for the intended purpose.

a.	Code name and version	SCALE 4.4a
b.	Function of code	Nuclear data preparation; criticality safety; shielding; decay heat; radioisotope inventories
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	ORNL/Nuclear Regulatory Commission
e.	Commercial, Proprietary or Other (Explain)	Open, publicly available from RSICC/ORNL
f.	Current Owner/Vendor and technical support provider	Radiation Safety Information Computational Center
g.	Documentation available	Yes; user manual, software model and req., I/O probs.
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation, PC, mainframe
i.	Operating System (Windows, DOS, other)	Windows, LINUX, others
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Reported to SCALE website
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	None

a.	Code name and version	DOORS-DORT Version 3.2
b.	Function of code	Shielding and reactor physics calculations, neutron/gamma radiation transport
c.	Application (what projects/facilities at the site/lab)	HFIR/ SNS
d.	Code developer and/or sponsor	ORNL/DOE
e.	Commercial, Proprietary or Other (Explain)	Open, available through RSICC
f.	Current Owner/Vendor and technical support provider	ORNL and Pennsylvania State University (Y. Y. Azmy)
g.	Documentation available	Yes; user manual, software model and req., I/O problems
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation, PC, Mainframe
i.	Operating System (Windows, DOS, other)	LINUX
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Email to RSICC, Penn State, NSTD/ORNL
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Many codes (1D, 2D, 3D-transport, and auxiliary codes), not really user friendly

a.	Code name and version	MCNP5 Version 1.20
b.	Function of code	Criticality safety, shielding, reactor physics
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	Los Alamos National Lab/DOE
e.	Commercial, Proprietary or Other (Explain)	Open to US citizens, RSICC
f.	Current Owner/Vendor and technical support provider	LANL
g.	Documentation available	Yes; user manual, software model and req., I/O problems
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation, PC, Mainframe
i.	Operating System (Windows, DOS, other)	Windows, LINUX
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Through MCNP website; RSICC
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	None

a.	Code name and version	REBUS-PC, DIF3D8/VARIANT8
b.	Function of code	Reactor physics; fuel depletion
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	Argonne National Laboratory
e.	Commercial, Proprietary or Other (Explain)	Open, RSICC
f.	Current Owner/Vendor and technical support provider	Argonne National Laboratory
g.	Documentation available	Yes; user manual, software model and req., I/O problems
h.	Code platform (Workstation, PC-based, Mainframe)	PC, Workstation, Mainframe
i.	Operating System (Windows, DOS, other)	Windows, LINUX
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Reported to RSICC
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	None

a.	Code name and version	ATTILA
b.	Function of code	Reactor physics, shielding
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	RADION Technologies, todd@radiative.com
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	RADION Technologies
g.	Documentation available	Only on-line users manual supplied with code
h.	Code platform (Workstation, PC-based, Mainframe)	PC, Workstation
i.	Operating System (Windows, DOS, other)	Windows, LINUX
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	Reported to RADION via email
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	None

a.	Code name and version	VENTURE
b.	Function of code	Reactor physics, fuel depletion
c.	Application (what projects/facilities at the site/lab)	HFIR
d.	Code developer and/or sponsor	ORNL/DOE
e.	Commercial, Proprietary or Other (Explain)	Other (internal ORNL version), older version. at RSICC
f.	Current Owner/Vendor and technical support provider	NSTD/ORNL
g.	Documentation available	Limited; user manual, vague software model, input problems
h.	Code platform (Workstation, PC-based, Mainframe)	Workstation, PC
i.	Operating System (Windows, DOS, other)	LINUX, Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	J. C. Gehin, NSTD/ORNL
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	None

a.	Code name and version	MICROSHIELD, Version 5.03
b.	Function of code	Radiation shielding (gamma only), decay heat calculations
c.	Application (what projects/facilities at the site/lab)	HFIR/ORNL
d.	Code developer and/or sponsor	Grove Engineering
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	UT-Battelle/Grove Engineering
g.	Documentation available	User's manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC-based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Grove Engineering
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Very user friendly. Good for general design since calculated doses are conservatively high. Other codes, such as MCNP, are utilized when detailed analysis required.

a.	Code name and version	MCNPX 2.1.5
b.	Function of code	High-energy multi-particle radiation transport
c.	Application (what projects/facilities at the site/lab)	SNS
d.	Code developer and/or sponsor	DOE
e.	Commercial, Proprietary or Other (Explain)	Government
f.	Current Owner/Vendor and technical support provider	LANL
g.	Documentation available	User manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC cluster
i.	Operating System (Windows, DOS, other)	Redhat Linux
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	E-mail to user group
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Easy to use, well documented

a.	Code name and version	MCNPX 2.4.0
b.	Function of code	High-energy multi-particle radiation transport
c.	Application (what projects/facilities at the site/lab)	SNS
d.	Code developer and/or sponsor	DOE
e.	Commercial, Proprietary or Other (Explain)	Government
f.	Current Owner/Vendor and technical support provider	LANL
g.	Documentation available	User manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC cluster
i.	Operating System (Windows, DOS, other)	Redhat Linux
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	E-mail to user group
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Easy to use, well documented, greatly improved compared to 2.1.5

a.	Code name and version	HETC
b.	Function of code	High-energy multi-particle radiation transport
c.	Application (what projects/facilities at the site/lab)	SNS
d.	Code developer and/or sponsor	DOE
e.	Commercial, Proprietary or Other (Explain)	Government
f.	Current Owner/Vendor and technical support provider	ORNL
g.	Documentation available	User manual
h.	Code platform (Workstation, PC-based, Mainframe)	IBM RS6000
i.	Operating System (Windows, DOS, other)	
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	O
k.	How are error and user questions reported?	E-mail to code developer
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Restricted to above 20 MeV neutron transport

a.	Code name and version	ORIHET95
b.	Function of code	Activation
c.	Application (what projects/facilities at the site/lab)	Spallation Neutron Source
d.	Code developer and/or sponsor	PSI
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	PSI
g.	Documentation available	User manual
h.	Code platform (Workstation, PC-based, Mainframe)	PC cluster
i.	Operating System (Windows, DOS, other)	Redhat Linux
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	E-mail to experts
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	Very robust and fast, underestimates decay heat

a.	Code name and version	StaadPro 2003 2nd Edition
b.	Function of code	Structural design and analysis software package capable of completing both static and dynamic structural problems including finite element analysis. Effective in analyzing and designing structures containing common construction materials using a variety of design codes.
c.	Application (what projects/facilities at the site/lab)	ORNL nuclear facilities
d.	Code developer and/or sponsor	Research Engineers International
e.	Commercial, Proprietary or Other (Explain)	Commercial
f.	Current Owner/Vendor and technical support provider	Research Engineers International
g.	Documentation available	Yes
h.	Code platform (Workstation, PC-based, Mainframe)	PC based
i.	Operating System (Windows, DOS, other)	Windows
j.	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O;)	R
k.	How are error and user questions reported?	Phone call or email
l.	Comments on experience with this computer software, ease of application, documentation provided; known errors or issues	StaadPro is a widely used computer program which is simple to use. Input through graphical interface windows allows rapid construction of computer models. Output manipulation is also easily accomplished through the graphical interface.

National Nuclear Security Administration

Lawrence Livermore National Laboratory

National Nuclear Security Administration

Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory

October 29, 2003

RECEIVED

OCT 30 2003

Mr Phillip Hill
Acting Deputy Manager
Safety and Environmental Programs
U S. Department of Energy
Livermore Site Office
P.O. Box 808, L-293
Livermore, CA 94551

Subject: LLNL Action Plans for DOE Software QA Implementation Plan

Reference Letter from Phillip E. Hill to Dennis K Fisher regarding "Recommendation 2002-1 Implementation Plan Commitment 4.2 3 2," dated October 8, 2003.

Dear Mr. Hill:

Attached is the LLNL Action Plan for QAIP 3.3 and SQAIP 4.2.1 5, 4.2.3.2, and 4.2.4.2. These plans have been coordinated with your staff. This Action Plan was developed using information provided by NNSA up to October 28, 2003. The NNSA is sponsoring a workshop on these and other commitments on November 13-14, 2003. Changes in the definitions or expectations of these action items coming out of that meeting may impact the stated commitments.

Sincerely,

Dennis K. Fisher

Dennis K. Fisher
Associate Director
Safety and Environmental Protection

Attachments

cc: T. Larson
J. Palmer
H. Wong

DKF CY01 - 435

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	Survey Form: Safety Design Software	
a	Code Name and Version	Hotspot Version 2.05
b	Area of Applicability (e g , structural, Fire protection)	Radioactive material dispersion code
c	Function of Code	Hotspot is used for safety-analysis of facilities handling nuclear material In addition, Hotspot provides emergency response personnel and emergency planners with a fast, field-portable set of software tools for evaluating incidents involving radioactive material.
d	Application (what projects/facilities at site/lab)	Safety Analyses for LLNL and DOE facilities and Experiments LLNL Emergency Operations Center DOE RAP/RAPTOR programs
e	Code Developer and/or Sponsor	Steven Homann Lawrence Livermore National Laboratory - DOE
f	Commercial, Proprietary, or Other (Explain)	Other (DOE code)
g	Current Owner/Vendor	Lawrence Livermore National Laboratory - DOE
h	Technical Support Provider	Steven Homann Lawrence Livermore National Laboratory (925) 423-4962 shomann@llnl.gov
i	Code Platform (Workstation,PC-based, Mainframe)	PC-based
j	Operating System	Windows 95/98/00/NT/XP OS
k	Frequency of Use (Routine, repeated use, code of choice-R; Occasional use – O)	R
l	Comments on experience with this computer software, ease of application, documentation provided, known errors or issues	Hotspot is used throughout the world Original software created in 1988 Program is very easy to run. Complete Hotspot documentation and user manual are contained within the run-time program (CD).
	Name and phone number of contact.	Steven Homann, (925) 423-4962

10/16/03

Summary of Action Items

QA IP 3.3 NA will validate and verify that QA processes are effectively implemented for facility safety Due: December 31, 2003

LLNL proposes that a combination of the previous assessments, such as the Best Practices Assessment conducted in the summer of 2001, the ARO assessment of Configuration Management conducted in the Spring of 2003, various trip reports of the DNFSB Staff and other assessment processes provide a credible case that current processes are effective. These assessments looked at a variety of systems and processes and in the aggregate will be used to provide a summary overview of the application of QA practices to safety systems.

4.2.1.5. Survey of candidate design codes for toolbox. Due October 31, 2003 .

LLNL proposes Hotspot v 2.05 for inclusion into the tool box. The questionnaire is attached. LLNL is not currently funded nor tasked to validate this code.

Recommendation. DOE should establish a criteria for and a process of how codes will be qualified to be placed in the tool box. This would help the sites in making a decision on what codes be nominated for the tool box.

The assessments for 4.2 3 2, and 4.2.4.2. will be conducted together. The emphasis will be on identifying requirements and their implementation. Currently, the LLNL Work Smart Standards Set does not include software QA standards Therefore, it is expected that many of attributes defined in the CRADs will not have been formally or consistently applied. In conducting the assessment the following protocols will be followed. Where a requirement can be identified, its implementation will be verified by looking at recent activities Where a requirement does not exist or has only recently been identified, it will be assumed that the requirement has not been implemented and evidence of implementation will not be sought

This assessment will be applied site wide to both NA and EM facilities.

4 2.3.2 Establish a schedule to identify, select and assess safety system software and firmware in defense nuclear facilities Due: October 29, 2003

LLNL proposes that safety system software and firmware be identified by January 31, 2004, systems to be assessed be selected by April 30, 2004 and the assessment will take place in the spring and early summer of 2004. This assessment will be coordinated with 4 2 4.2, below

4 2.4 2. Establish a schedule to complete the assessment of the processes in place to ensure that safety software currently used to support analysis and design is adequate. Due: October 29, 2003

This is an assessment of the QA processes used to develop and support software, not a code by code review. This assessment will be coordinated with 4.2.3.2, above.

This assessment will review facility related safety software and will not include weapons design codes

National Nuclear Security Administration

Los Alamos National Laboratory

LOS ALAMOS NATIONAL LABORATORY: Design and Analysis Code Survey Data

A. SoftwareName/ Version	Sap2000, NL	ETABS, NL	SAFE
Area of Applicability	Structural	Structural	Structural-Slabs
B. Function of Code	Design and Analysis	Design and Analysis	Design and Analysis
C. Application	Documented Safety analysis, seismic analysis	Documented Safety analysis, seismic analysis	Documented Safety analysis, seismic analysis
D. Code Developer/Sponsor	Computers and Structures, Inc.	Computers and Structures, Inc.	Computers and Structures, Inc.
E. Commercial, Proprietary, or Other (explain)	Commercial	Commercial	Commercial
F. Current Owner/ Vendor and Technical Support Provider	LANL/CSI	LANL/CSI	LANL/CSI
G. Documentation Available	CSI	CSI	CSI
H. Code Platform (Workstation, PC-based, Mainframe)	PC	PC	PC
I. Operating System (Windows, DOS, Other)	Windows	Windows	Windows
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	R
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Easy to use, support from provider is difficult	Easy to use, support from provider is difficult	Easy to use, support from provider is difficult
name and phone number of contact	Mike Salmon, 5-7244	Mike Salmon, 5-7244	Mike Salmon, 5-7244

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	RISA-3d	MATHCAD	ABAQUS
Area of Applicability	Structural	All	Nonlinear Analysis
B. Function of Code	Analysis	Numerical Processing	Analysis
C. Application		All	DSA - Seismic Analysis
D. Code Developer/Sponsor		Mathsoft	HKS
E. Commercial, Proprietary, or Other (explain)		Commercial	Commercial
F. Current Owner/ Vendor and Technical Support Provider		LANL/Mathsoft	LANL/HKS
G. Documentation Available		Mathsoft + Users Forums	HKS
H. Code Platform (Workstation, PC-based, Mainframe)		PC	UNIX
I. Operating System (Windows, DOS, Other)		Windows	SGI/Unix
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)		R	O
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)		Easy to use, sufficient documentation	Difficult to use and learn, but very powerful
name and phone number of contact		Mike Salmon, 5-7244	Francisco Guerra, 7-2143

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	SHAKE91	SASSI	BlastX
Area of Applicability	Site Response	Soil Structure Interaction	Structural Safety Analysis
B. Function of Code	Analysis	Analysis	Blast Analysis-BLASTX code calculates the propagation of blast shock waves and detonation product gases in multiroom structures. The code provides predictions of the pressure-time and temperature-time histories in these structures.
C. Application	Documented Safety analysis, seismic analysis	Documented Safety analysis, seismic analysis	DSA, Seismic Analysis
D. Code Developer/Sponsor	UC-Berkeley	UC-Berkeley	US Army - SAIC
E. Commercial, Proprietary, or Other (explain)			Commercial (although may not be supported by SAIC any longer)
F. Current Owner/ Vendor and Technical Support Provider	UC-Berkeley	UC-Berkeley	US Army - SAIC
G. Documentation Available	none (TWHouston)	none (TWHouston)	SAIC
H. Code Platform (Workstation, PC-based, Mainframe)	UNIX,PC,Linux	UNIX,PC,Linux	PC
I. Operating System (Windows, DOS, Other)	Windows/Unix	Windows/Unix	Windows DOS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	O	O	O
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Easy to use, sufficient documentation	Moderately easy to use and learn. Interpretation of results requires experience	Easy to use, sufficient documentation
name and phone number of contact	Tom Houston, 5-7244	Tom Houston, 5-7244	I. Cuesta, 5-1911

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	PSADS	MASS	SQL LIMS Version 3.1
Area of Applicability	Structural	Calculating MAR (materials at risk) Authorization Basis	Authorization Basis MAR Limits
B. Function of Code	Blast Design	System of record for tracking nuclear material and reporting inventory and transactions to NMMSS	Inventory and track MAR
C. Application	DSA	LANL Wide	CMR facility-wide
D. Code Developer/Sponsor	US Army	**Fermin Kelso**	Marie J. De La Torre / Bryan Omalley
E. Commercial, Proprietary, or Other (explain)		**Proprietary**	Commercial with proprietary enhancements
F. Current Owner/ Vendor and Technical Support Provider	US Army	LANL NMT-3	Applied Bio Systems
G. Documentation Available		LANL NMT-3	Applied Bio Systems
H. Code Platform (Workstation, PC-based, Mainframe)	PC	Mainframe	Mainframe
I. Operating System (Windows, DOS, Other)	Windows	Guardian OS	VMS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	O	R	R
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Moderately easy to use and learn.	none	none
name and phone number of contact	I. Cuesta, 5-1911	Michael Boor 5-1222	Bryan Omalley 5-1769

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	Transient Combustible Excel Spreadsheet Rev. 2.1	MAR_Summary032701 version 1.0.0.1	HASS
Area of Applicability	Fire Protection	Authorization Basis MAR Inventory	Fire Protection Automatic Sprinkler
B. Function of Code	To aid operators in the performance of transient combustible TSR surveillance calculations	To sum the MAR in the CMR Facility to aid in the performance of the MAR inventory TSR	Hydraulic Calculation of fire suppression systems per NFPA 13-16, 20 E.g. TA-3-29, TA-16-205/450, TA-55-4
C. Application	CMR facility-wide	CMR facility-wide	Applicable to any facility w/sprinkler or other water-based systems
D. Code Developer/Sponsor	Microsoft Excel	Chris McConaha NMT-3	Vendor
E. Commercial, Proprietary, or Other (explain)	Commercial and Proprietary	Proprietary	Commercial
F. Current Owner/ Vendor and Technical Support Provider	Microsoft Excel	NMT-3	See Below
G. Documentation Available	Ted Partch	NMT-3	Vendor
H. Code Platform (Workstation, PC-based, Mainframe)	PC-based	PC-based	PC
I. Operating System (Windows, DOS, Other)	MS Windows 200 Professional	Windows	Windows or DOS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	R	O
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	none	none	Commercially since 1976 Industry Standard, "Hydraulic Analyzer of Sprinkler Systems"
name and phone number of contact	Kenny Espinosa 5-5669	Chris McConaha 7-3528	ASA Tuten, 770-934-8423

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	CFAST/FAST 5.0.1 3.1.7, 2.0.1	CAMEOfm (May 02), ALOHA5.3.2 (March 00), MARPLOT 3.3	EPIcode 6.01 DOS 2.03 Windows
Area of Applicability	Safety Analysis and Fire Hazards Analysis	Safety Analysis Emergency Planning and Response	Safety Analysis Emergency Planning and Response
B. Function of Code	Accident Analysis, Fire growth and smoke transport	Chemical dispersion	Chemical release/Dispersion and Consequence
C. Application	DSA/JCO	DSA	DSA
D. Code Developer/Sponsor	National Institute of Standards and Technology (NIST)	EPA	Homann Associates
E. Commercial, Proprietary, or Other (explain)	Public Domain	Public Domain	Commercial
F. Current Owner/ Vendor and Technical Support Provider	US Commerce Department	EPA	Homann Associates
G. Documentation Available	NIST	EPA	Homann Associates
H. Code Platform (Workstation, PC-based, Mainframe)	PC 386 or higher	PC or Mac	PC
I. Operating System (Windows, DOS, Other)	DOS	Windows 95/98/00/NT/XP or Mac System 7.X	Windows or DOS
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R/O	R	R
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	moderate usage	none	none
name and phone number of contact	Ronald Eaton 7-8064, Eric Edmonds 7-6998	Eric Edmonds 7-6998	Eric Edmonds 7-6998

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	MACCS2	GENII 2	MELCOR
Area of Applicability	Nuclear Facility Safety Analysis and environmental impact statements	Safety Analysis and EM&R	Leakpath Factor
B. Function of Code	Radionuclide dispersion	Radionuclide dispersion	
C. Application	DSA	DSA	
D. Code Developer/Sponsor	SNL (MACCS2)	Pacific Northwest National Laboratory (PNNL)	
E. Commercial, Proprietary, or Other (explain)	Public Domain	Public Domain	
F. Current Owner/ Vendor and Technical Support Provider	NRC	EPA	
G. Documentation Available	NRC via SNL	EPA	
H. Code Platform (Workstation, PC-based, Mainframe)	PC	PC	
I. Operating System (Windows, DOS, Other)	DOS	Windows 95/98/00/NT	
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	O	
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	none	none	
name and phone number of contact	Eric Edmonds 7-6998	Eric Edmonds 7-6998	Eric Edmonds 7-6998

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	MCNPx	MCNP-4C	FDS2
Area of Applicability	Neutronics (and other particle) design and analysis	Design and Analysis of Neutronic Systems, Neutron Transport Calculations	
B. Function of Code	Monte Carlo radiation transport	Design and Analysis, solves the Boltzmann neutron transport equation	Accident Analysis
C. Application	See Detail Below: (A)	Used for accident analysis	DSA/JCO
D. Code Developer/Sponsor	Many. Primarily AFCI, also various N, ISR, LANSCE, NASA, outside contractors, others.	X-Division, LANL	
E. Commercial, Proprietary, or Other (explain)	Proprietary	Proprietary	
F. Current Owner/ Vendor and Technical Support Provider	LANL D-5	LANL	
G. Documentation Available	LANL	LANL	
H. Code Platform (Workstation, PC-based, Mainframe)	all unix , PC windows, Mac G5, and we are adding new platforms all the time	UNIX TRUE 264, PC	
I. Operating System (Windows, DOS, Other)	Unix , windows, Mac OS	Unix, Windows NT/2000	
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	The code was used extensively during the preparation of the TA-18 BIO, used extensively elsewhere.	
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	MCNPX currently released version at RSICC 2.4.0 (a new version, 2.5.0 will be released to RSICC probably in January. we teach 5-day classes (298 people trained since August 2001). program.	At our site, we use MCNP on a daily basis t odesign critical experiments. Tehere are many publications that appropriately advise the users on how to use the MCNP code.	
name and phone number of contact	Laurie Waters 5-4127	Rene Sanchez 662-7282	Ronald Eaton 7-8064

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	POSTMAX 2	SeaTREE	Explosive Release Atmospheric Dispersion (ERAD) 3.2 (Windows) or 3.1 (UNIX
Area of Applicability	Nuclear Facility Safety Analysis and Emergency Response Impact Statements		Selected Safety Analysis
B. Function of Code	Radionuclide dispersion Accident Analysis	Accident Analysis	The ERAD model is a three-dimensional numerical simulation of particle dispersion in the atmosphere. The model was developed to provide realtime predictions of the near-filed radiological hazards which would result from an explosive release of hazardous material.
C. Application	DSA/JCO	DSA/JCO	DSA
D. Code Developer/Sponsor	LANL (POSTMAX)		Bruce Boughton Sandia National Laboratory Albuquerque, New Mexico 87185 babough@sandia.gov
E. Commercial, Proprietary, or Other (explain)	Public Domain		Public Domain
F. Current Owner/ Vendor and Technical Support Provider	LANL		DOE
G. Documentation Available	LANL		SNL via NMSU Kerry Alt (505)646-3645 ERAD_support @cs.nmsu.edu
H. Code Platform (Workstation, PC-based, Mainframe)	PC		PC or UNIX SPARCstation 10 or better
I. Operating System (Windows, DOS, Other)	DOS		Windows 95 or NT 4.X Solaris 2.6 (UNIX)
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R		O

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	POSTMAX 2 (cont.)	SeaTREE (cont.)	Explosive Release Atmospheric Dispersion (ERAD) 3.2 (Windows) or 3.1 (UNIX) (cont.)
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	none		none
name and phone number of contact	Eric Edmonds 7-6998	Ronald Eaton 7-8064	Eric Edmonds 7-6998

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	HOTSPOT 2.05	Autodesk - Autocad	AutoPipe Plus 6.3
Area of Applicability	Safety Analysis and EM&R	Mechanical Engineering	Mechanical Pipe-Stress
B. Function of Code	Radionuclide dispersion		Pipe stress analysis, hanger design stress
C. Application	DSA	HVAC	Dynamic pipe fitting stress for any piping project
D. Code Developer/Sponsor	Pacific Northwest National Laboratory (PNNL)	NA	AutoPIPE
E. Commercial, Proprietary, or Other (explain)	Public Domain	Commercial	Commercial
F. Current Owner/ Vendor and Technical Support Provider	EPA	NA	LANL (one seat)
G. Documentation Available	EPA	Marisa Gallegos	Bentley Systems
H. Code Platform (Workstation, PC-based, Mainframe)	PC	PC	PC
I. Operating System (Windows, DOS, Other)	Windows 95/98/00/NT	Windows XP	Windows
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	O	O	O
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	none	Powerful bur not intuitive	I have used many stress analysis programs. This is the best choice.
name and phone number of contact	Eric Edmonds 7-6998	L. Bornstein 7-4104	Doug Bailey 7-9870

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	AFT Fathom 5.0	COSMOS/M 2.6	ANSYS V7.1
Area of Applicability	Mechanical Pipe-Flow	Structural Mechanical	Structural (Static Dynamic Thermal)
B. Function of Code	Pipe flow analysis modeling, incompressible flow	Finite Element analysis, analytical solutions	Finite Element Analysis
C. Application	Any liquid flow modeling at any sie	TA-55 Glove box systems	SHEBA CAV, misc support structures, exp. Hardware
D. Code Developer/Sponsor	Applied Flow Technology	Structural Research and Analysis Corp.	ANSYS, Inc.
E. Commercial, Proprietary, or Other (explain)	Commercial	Commercial	Commercial
F. Current Owner/ Vendor and Technical Support Provider	LANL (one sat)	Curtis Sandoval	Eric Sorensen
G. Documentation Available	Applied Flow Technology	Sunwest Cad, Albuquerque, NM	ANSYS, Inc.
H. Code Platform (Workstation, PC-based, Mainframe)	PC	PC	PC
I. Operating System (Windows, DOS, Other)	Windows	Windows NT	Windows NT/2000
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	R	O	O
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	Mechanical Engineering rated this program the best pipe flow analysis system available. I have used others and I agree that this is the best.	Recommended	Excellent
name and phone number of contact	Doug Bailey 7-9870	Curtis Sandoval 7-7920	Eric Sorensen 5-3630

Design and Analysis Code Survey Data (Cont.)

A. SoftwareName/ Version	DESIRE 2000	DANTSYS	SANET
Area of Applicability	Differential Equations Solver	Neutron Transport Calculations	
B. Function of Code	Code solves coupled point kinetics and heat transfer differential equations	Code solves the Boltzmann neutron transport equation using the discrete-ordinates technique	Accident Analysis
C. Application	Used for accident analyses in nuclear facilities	Used for accident analysis in nuclear facilities	DSA/JCO
D. Code Developer/Sponsor	G.A. and T. M. Korn Industrai lConsultants	LANL	
E. Commercial, Proprietary, or Other (explain)	Commercial		
F. Current Owner/ Vendor and Technical Support Provider	LANL	LANL	
G. Documentation Available	G.A. and T. M. Korn Industrai lConsultants	LANL	
H. Code Platform (Workstation, PC-based, Mainframe)	PC	UNIX TRUE 264, PC	
I. Operating System (Windows, DOS, Other)	Windows 3.1, 95, NT	Unix	
J. Frequency of Use (Routine, repeated use, code of choice - R; Occasional Use - O;)	The code was used extensively during the preparation of the TA-18 BIO	The code was used extensively during the preparation of the TA-18 BIO	
K. Comments (on experience with this computer software, ease of application, documentation provided; known errors or issues)	At our site, we use DESIRE to understand the dynamic behavior of critical experiments in the event of an accident due to miss loading the assembly or an anticipated insertion of reactivity without SCRAM. In addition, there is a comprehensive manual that explains the main features of the code.	At our site, we use DANTSYS on a daily basis t odesign critical experiments and compare its results t othose obtained with MCNP. In addition, there are many publicaions that appropriately advise the users on how to use the DANTSYS codes.	
name and phone number of contact	Rene Sanchez 662-7282	Rene Sanchez 662-7282	Ronald Eaton 7-8064

National Nuclear Security Administration

Pantex Plant

United States Government | Department of Energy

memorandum

National Nuclear Security Administration
Pantex Site Office

DATE: NOV 14 2003

REPLY TO ATTN OF: AMOA:PXSO:KEW

SUBJECT: Design Code Survey

TO: Everet H. Beckner, Deputy Administrator, Defense Programs, NA-10/FORS

REFERENCE: HQ Memorandum *Survey of Design Codes Currently in Use*, Cook/Beckner, dated September 12, 2003

This is being provided in response to the reference memorandum. Any questions may be directed to Mark Blackburn at (806) 477-3123.

for Karl E. Waltzer
Assistant Manager for
Oversight & Assessments

Attachment

cc w/attachment:
X. Ascanio, NA-124/GTN
R. Singh, NA-124/GTN

S: AMOA/2003memos/14451

Survey Form: Safety Design Software		
a	Code Name & Version	SOURCES-4C: Code System for Calculating alpha, n; Spontaneous Fission; and Delayed Neutron Sources and Spectra.
b	Area of Applicability (e.g., structural, fire protection)	The nuclear criticality safety of fissile materials.
c	Function of Code	**Function**: SOURCES-4C is a code system that determines neutron production rates and spectra from alpha, n reactions; spontaneous fission; and delayed neutron emission due to radionuclide decay.
d	Application (what projects/facilities at the Site/Lab	SOURCES-4C is used to analyze the nuclear criticality safety of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer**: Los Alamos National Laboratory (LANL) **Code distributor**: Radiation Safety Information Computational Center (RSICC).
f	Commercial, Proprietary, or Other (explain)	**Other**: SOURCES-4C was prepared by the Regents of the University of California at Los Alamos National Laboratory under contract number W-7405-ENG-36 for the U.S. Department of Energy (DOE). The University retains rights in the SOURCES-4C program therefore, SOURCES-4C is restricted from distribution to third-parties without a license. SOURCES-4C is further restricted from distribution for Anti-terrorism (AT) purposes by the U.S. Department of Commerce Title 15 Commerce and Foreign Trade, Chapter VII B Bureau of Export Administration, Parts 730-774, Commerce Control List as OD999 Specific Software.
g	Current Owner/Vendor	**Distributor**: Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	See user manual LA-UR-02-1617.
i	Code Platform (Workstation, PC-based, Mainframe)	**Code**: Fortran 77 **Platform**: PC and Workstation
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Routine (R) use is expected in FY05 because SOURCES-4C will become a essential element of characterizing the response of fissile materials at Pantex Plant.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	The SOURCES-4C software manual are comprehensive in identifying all the functional requirements and features of the code.
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Survey Form: Safety Design Software		
a	Code Name & Version	TWODANT: A two-dimensional (2D), multigroup, discrete-ordinates transport code system.
b	Area of Applicability (e.g., structural, fire protection)	The nuclear criticality safety of fissile materials.
c	Function of Code	**Function:** TWODANT is a cursory tool used to calculate the k-eff of fissile systems. **Nature of Problem Solved:** It is a modular computer program designed to solve the two-dimensional, time-independent, multigroup discrete-ordinates form of the Boltzmann transport equation. **Method of Solution:** TWODANT uses the discrete ordinates approximation for treating the angular variation of the particle distributions. The diamond difference scheme is used for phase space discretization. In TWODANT, there is an option to use the adaptive weighted diamond method. Both inner and outer iterations are accelerated using the diffusion synthetic acceleration method.
d	Application (what projects/facilities at the Site/Lab	TWODANT is used to provide a cursory evaluation of the nuclear criticality safety of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer:** Los Alamos National Laboratory (LANL) **Code distributor:** Radiation Safety Information Computational Center (RSICC).
f	Commercial, Proprietary, or Other (explain)	**Other:** TWODANT was prepared by Los Alamos National Laboratory (LANL). It is restricted from distribution to third-parties without a license. TWODANT is further restricted from distribution for Anti-terrorism (AT) purposes by the U.S. Department of Commerce Title 15 Commerce and Foreign Trade, Chapter VII B Bureau of Export Administration, Parts 730-774, Commerce Control List as OD999 Specific Software.
g	Current Owner/Vendor	**Distributor:** Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	Users can receive technical support via email: xtmsn@lanl.gov .
i	Code Platform (Workstation, PC-based, Mainframe)	**Code:** Fortran 77 (99.9%) and C (0.1%). **Platform:** PC and Workstation
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Frequency will be Routine upon validation and verification (V&V) of the code. Currently, TWODANT has not been V&V'd for use at Pantex Plant.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	User's experience is limited to hands-on experience. The user has easily set-up DANTSYS input decks and viewed the geometry. The tutorial manual is comprehensive and easy to use.
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Potential Software for DOE "Toolbox"

	Survey Form:	Safety Design Software
a	Code Name & Version	MACCS2
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Radiological Dispersion Calculation
d	Application (what projects/facilities at the Site/Lab	Nuclear Explosives Safety Calculations Authorization Basis Emergency Planning and Emergency Response
e	Code Developer and/or Sponsor	SNL (developer)/US NRC (sponsor)
f	Commercial, Proprietary, or Other (explain)	Government Owned
g	Current Owner/Vendor	Radiation Safety Information Computational Center (RSICC) @ ORNL or SNL
h	Technical Support Provider	RSICC/SNL
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	DOS
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	R
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	
Name and phone number of contact: Erik Eifert, x3549		

	Survey Form:	Safety Design Software
a	Code Name & Version	MELCOR
b	Area of Applicability (e.g., structural, fire protection)	Material Transport in Facility
c	Function of Code	Material Transport in Facility
d	Application (what projects/facilities at the Site/Lab	Nuclear Explosives Safety Calculations Authorization Basis
e	Code Developer and/or Sponsor	SNL (developer)/US NRC (sponsor)
f	Commercial, Proprietary, or Other (explain)	Government Owned
g	Current Owner/Vendor	Radiation Safety Information Computational Center (RSICC) @ ORNL or SNL
h	Technical Support Provider	RSICC/SNL
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	DOS
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	R
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	
Name and phone number of contact: Erik Eifert, x3549		

Survey Form:	Safety Design Software	
a	Code Name & Version	ERAD
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Radiological Dispersion Calculation
d	Application (what projects/facilities at the Site/Lab	Nuclear Explosives Safety Calculations Authorization Basis
e	Code Developer and/or Sponsor	SNL
f	Commercial, Proprietary, or Other (explain)	Government Owned
g	Current Owner/Vendor	Bruce Boughton Sandia National Laboratory Albuquerque, NM 87185 505-844-8545
h	Technical Support Provider	Bruce Boughton Sandia National Laboratory Albuquerque, NM 87185 505-844-8545
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	Windows
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	R
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	
Name and phone number of contact: Erik Eifert, x3549		

Survey Form: Safety Design Software		
a	Code Name and Version	HotSpot Version 2.0
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Radiological Dispersion Calculation
d	Application (what projects/facilities at the site/lab)	Emergency Planning Emergency Response Authorization Basis Nuclear Explosives Safety Studies
e	Code Developer and/or Sponsor	Steven G. Homann LLNL
f	Commercial, Proprietary, or Other (Explain)	Government Owned
g	Current Owner/Vendor	LLNL
h	Technical Support Provider	www.llnl.gov/nai/technologies/hotspot
i	Code Platform (Workstation, PC-based, Mainframe)	PC
j	Operating System	The Hotspot codes have been developed for the Windows, 95/98/00/NT/XP operating systems
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	Easy to use, the only Tritium codes used.
Name and phone number of contact: - At Pantex: Charles Rives x-5959		

Survey Form: Safety Design Software		
a	Code Name and Version	EPIcode Version 2.03
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Chemical Dispersion Modeling
d	Application (what projects/facilities at the site/lab)	Emergency Planning Emergency Response Authorization Basis Nuclear Explosives Safety Studies
e	Code Developer and/or Sponsor	Homann & Associates (510)490-6379
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Homann & Associates
h	Technical Support Provider	Homann & Associates
i	Code Platform (Workstation, PC-based, Mainframe)	PC
j	Operating System	The Hotspot codes have been developed for the Windows, 95/98/00/NT/XP operating systems
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	R
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	EPI Code performs automated dispersion calculations using algorithms published in US EPA documents. No "black box" methods are included in EPI Code
Name and phone number of contact: At Pantex: Charles Rives x-5959		

Survey Form: Safety Design Software		
a	Code Name and Version	ALOHA 5.2.3.
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Chemical Dispersion Modeling
d	Application (what projects/facilities at the site/lab)	Emergency Planning Emergency Response Authorization Basis Nuclear Explosives Safety Studies
e	Code Developer and/or Sponsor	U.S. Department of Commerce • National Oceanic and Atmospheric Administration • NOAA's National Ocean Service
f	Commercial, Proprietary, or Other (Explain)	Government
g	Current Owner/Vendor	U.S. Department of Commerce • National Oceanic and Atmospheric Administration • NOAA's National Ocean Service
h	Technical Support Provider	www.epa.gov/ceppo/cameo/aloha.htm . For additional information: visit www.response.restoration.noaa.gov/cameo/aloha.html e-mail orr.cameo@noaa.gov call 206/526-6317.
i	Code Platform (Workstation, PC-based, Mainframe)	PC
j	Operating System	ALOHA runs on Apple Macintosh computers and in Microsoft Windows 95, 98, NT, or 2000.
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	R
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	
Name and phone number of contact: At Pantex: Charles Rives x-5959		

Survey Form: Safety Design Software		
a	Code Name and Version	NARAC.
b	Area of Applicability (e.g., structural, fire protection)	Consequence Assessment
c	Function of Code	Chemical and Radiological Dispersion Modeling
d	Application (what projects/facilities at the site/lab)	Emergency Planning Emergency Response
e	Code Developer and/or Sponsor	LLNL
f	Commercial, Proprietary, or Other (Explain)	Proprietary to LLNL
g	Current Owner/Vendor	LLNL
h	Technical Support Provider	For software technical support, please contact: NARAC Customer Support Phone: 925-422-9159 Hours: 7:30am - 4:15pm Pacific Time Monday - Friday, except holidays E-mail: narac@llnl.gov
i	Code Platform (Workstation, PC-based, Mainframe)	Internet Based – Runs on a mainframe at LLNL via internet
j	Operating System	Internet Based – Runs on a mainframe at LLNL via internet
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	
Name and phone number of contact: At Pantex, David Griffis x-4426		

Survey Form: Safety Design Software		
a	Code Name and Version	Trace 700 Version 4.0
b	Area of Applicability (e.g., structural, fire protection)	Mechanical – HVAC (Heating Ventilation and Air Conditioning)
c	Function of Code	Calculate HVAC loads for system evaluation, sizing and design - perform life cycle cost and energy analysis
d	Application (what projects/facilities at the site/lab)	All facilities
e	Code Developer and/or Sponsor	Trane Company
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Mechanical Design Group – Capital and Expense Projects Division
h	Technical Support Provider	Trane Company
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	Windows
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	Extensive training has been provided to users. Software is fairly user friendly. Adequate documentation has been provided and there are no known errors or issues.
Name and phone number of contact: Courtney Olson, 806-477-6578		

Survey Form: Safety Design Software		
a	Code Name and Version	BlastX Version 4.2
b	Area of Applicability (e.g., structural, fire protection)	Structural – Blast load prediction
c	Function of Code	Calculate blast load overpressures and time history
d	Application (what projects/facilities at the site/lab)	Used on any project where explosives operations are proposed. Basis for Cell facility dispersion analysis.
e	Code Developer and/or Sponsor	US Army Corps of Engineers, Engineer Research and Development Center
f	Commercial, Proprietary, or Other (Explain)	Other – distribution available to US Government agencies and their contractors
g	Current Owner/Vendor	Civil Design Group – Capital and Expense Projects Division
h	Technical Support Provider	US Army Corps of Engineers, Engineer Research and Development Center
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	Windows – Compatible with Windows 95, 98, NT, and 2000
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	Software is documented and easy to use. Adequate documentation has been provided and there are no known errors or issues.
Name and phone number of contact: Doug Kaczmarek, 806-477-4905		

Survey Form: Safety Design Software		
a	Code Name and Version	HASS
b	Area of Applicability (e.g., structural, fire protection)	Fire Protection
c	Function of Code	Hydraulic calculations for fire protection systems
d	Application (what projects/facilities at the site/lab)	All
e	Code Developer and/or Sponsor	HRS Systems
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Infrastructure Controls
h	Technical Support Provider	HRS Systems
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	Windows
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	No known errors. The computer software is easy to use and well documented.
Name and phone number of contact: Robert Calzareta, 806-477-6998		

Survey Form: Safety Design Software		
a	Code Name and Version	SKM Power Tools
b	Area of Applicability (e.g., structural, fire protection)	Electrical design
c	Function of Code	Short circuit, ground fault, and coordination calculations
d	Application (what projects/facilities at the site/lab)	Analysis of electrical distribution systems
e	Code Developer and/or Sponsor	SKM
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Electrical Design Group - CEPD
h	Technical Support Provider	SKM
i	Code Platform (Workstation, PC-based, Mainframe)	PC based
j	Operating System	Windows
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Anticipated frequent use
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	Recently purchased. Undergoing training and documentation appears to be adequate.
Name and phone number of contact: Dale Moon, 806-477-7070		

Survey Form: Safety Design Software		
a	Code Name and Version	STADD Pro - 2003
b	Area of Applicability (e.g., structural, fire protection)	Structural
c	Function of Code	Design of structural systems
d	Application (what projects/facilities at the site/lab)	Evaluation of structures, systems or components for seismic or wind loading
e	Code Developer and/or Sponsor	Research Engineers Inc.
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	CE Design Group - CEPD
h	Technical Support Provider	Research Engineers Inc.
i	Code Platform (Workstation, PC-based, Mainframe)	PC-based
j	Operating System	Windows
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	O
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	Currently using NRC QC certified
Name and phone number of contact: Jeff Wang, 806-477-7242		

Survey Form: Safety Design Software		
a	Code Name and Version	ANSYS 7.1 (Mechanical)
b	Area of Applicability (e.g., structural, fire protection)	Structural, Thermal, & Modal Finite Element Analysis.
c	Function of Code	Linear & Nonlinear Structural, Thermal, & Modal Analysis
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	Ansys Inc. http://www.ansys.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Ansys Inc. http://www.ansys.com/
h	Technical Support Provider	DRD Technology Corporation– (Tulsa, Oklahoma) http://www.drd.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at DRD Technology Corporation. - Online Help Exists Thru The Ansys Customer portal: http://www.ansys.com/myansys/index.htm As well as electronic manual's loaded with the software. - Ansys Software Has: Formal commitment to the requirements given in the United States Nuclear Regulatory Commission's Rules and Regulations, Title 10, Chapter 1, Code of Federal Regulation, Part 50, Appendix B and applicable parts of NQA-1, Subpart 2.7, Quality Assurance Requirements for Computer Software Acceptance of provisions of Title 10, Chapter 1,Code of Federal Regulations, Part 21, titled "Reporting of Defects and Noncompliance's" for commercial grade items. Tracking of customer-reported errors in ANSYS (Which you can audit) Long-term storage of and access to quality records Expedited error reporting with certified mailing Certificates of Conformance provided with product Shipments. Per Ansys Quality Services Page: http://www.ansys.com/services/quality_assurance.htm
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	ANSYS 7.1 (Professional)
b	Area of Applicability (e.g., structural, fire protection)	Structural, Thermal, & Modal Finite Element Analysis.
c	Function of Code	Linear, Limited Nonlinear Structural, Thermal, & Modal Analysis.
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	Ansys Inc. http://www.ansys.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Ansys Inc. http://www.ansys.com/
h	Technical Support Provider	DRD Technology Corporation– (Tulsa, Oklahoma) http://www.drd.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at DRD Technology Corporation. - Online Help Exists Thru The Ansys Customer portal: http://www.ansys.com/myansys/index.htm As well as electronic manual's loaded with the software. - Ansys Software Has: Formal commitment to the requirements given in the United States Nuclear Regulatory Commission's Rules and Regulations, Title 10, Chapter 1, Code of Federal Regulation, Part 50, Appendix B and applicable parts of NQA-1, Subpart 2.7, Quality Assurance Requirements for Computer Software Acceptance of provisions of Title 10, Chapter 1,Code of Federal Regulations, Part 21, titled "Reporting of Defects and Noncompliance's" for commercial grade items. Tracking of customer-reported errors in ANSYS (Which you can audit) Long-term storage of and access to quality records Expedited error reporting with certified mailing Certificates of Conformance provided with product Shipments. Per Ansys Quality Services Page: http://www.ansys.com/services/quality_assurance.htm
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	ANSYS 7.1 (FLOTRAN)
b	Area of Applicability (e.g., structural, fire protection)	CFD (Computational Fluid Dynamics)
c	Function of Code	CFD (Computational Fluid Dynamics)
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	Ansys Inc. http://www.ansys.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Ansys Inc. http://www.ansys.com/
h	Technical Support Provider	DRD Technology Corporation– (Tulsa, Oklahoma) http://www.drd.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at DRD Technology Corporation. - Online Help Exists Thru The Ansys Customer portal: http://www.ansys.com/myansys/index.htm As well as electronic manual's loaded with the software. - Ansys Software Has: Formal commitment to the requirements given in the United States Nuclear Regulatory Commission's Rules and Regulations, Title 10, Chapter 1, Code of Federal Regulation, Part 50, Appendix B and applicable parts of NQA-1, Subpart 2.7, Quality Assurance Requirements for Computer Software Acceptance of provisions of Title 10, Chapter 1,Code of Federal Regulations, Part 21, titled "Reporting of Defects and Noncompliance's" for commercial grade items. Tracking of customer-reported errors in ANSYS (Which you can audit) Long-term storage of and access to quality records Expedited error reporting with certified mailing Certificates of Conformance provided with product Shipments. Per Ansys Quality Services Page: http://www.ansys.com/services/quality_assurance.htm
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC ADAMS 2003
b	Area of Applicability (e.g., structural, fire protection)	Dynamics Simulation
c	Function of Code	Dynamics Simulation
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis and virtual tryouts for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The MSC's website: http://www.mscsoftware.com/support/prod_support/adams/?Q=135&Z=144&Y=174 As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC MARC 2003
b	Area of Applicability (e.g., structural, fire protection)	Structural, Thermal, Modal, & EM (ESD, Electromagnetic) Finite Element Analysis.
c	Function of Code	Linear & Nonlinear Structural, Thermal, Modal, & EM (ESD, Electromagnetic) Analysis.
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The MSC's website: http://www.mscsoftware.com/support/prod_support/marc/?Q=135&Z=144&Y=173 As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC Patran 2003
b	Area of Applicability (e.g., structural, fire protection)	FEA Pre & Post Processing
c	Function of Code	FEA Pre & Post Processing, Setup model and Review Results.
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis and virtual tryouts for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The MSC's website: http://www.mscsoftware.com/support/prod_support/patran/?Q=135&Z=144&Y=171 As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC Dytran 2002
b	Area of Applicability (e.g., structural, fire protection)	Structural Analysis.
c	Function of Code	Crash Analysis
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The MSC's website: http://www.mscsoftware.com/support/prod_support/dytran/?Q=135&Z=144&Y=175 As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC Nastran 2003
b	Area of Applicability (e.g., structural, fire protection)	Structural, Thermal, & Modal Finite Element Analysis.
c	Function of Code	Linear & Nonlinear Structural, Thermal, & Modal Analysis
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The M$C's website: http://www.mscsoftware.com/support/prod_support/nastran/?O=135&Z=144&Y=172 As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	MSC Mvision
b	Area of Applicability (e.g., structural, fire protection)	Materials Database
c	Function of Code	Store and Allow Creation of Materials Data For Use in FEA and Hand Analysis.
d	Application (what projects/facilities at the site/lab)	Used to perform design safety analysis for special tooling.
e	Code Developer and/or Sponsor	MSC Software Corporation http://www.mscsoftware.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	MSC Software Corporation http://www.mscsoftware.com/
h	Technical Support Provider	MSC Software Corporation http://www.mscsoftware.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at an MSC Training Facility. - Online Help Exists Thru The MSC's website: http://www.mscsoftware.com/support/prod_support/mvision/ As well as electronic manual's loaded with the software. - The MSC Software Quality Assurance Program covers all software related activities from specification through maintenance. As part of our commitment to quality, the MSC Software Quality Assurance Program complies With the applicable portions of Title 10, Code of Federal Regulations Part 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Title 10, Code of Federal Regulations, Part 21, Reporting of Safety Related Defects and Non-Compliances. Per MSC Quality Certification Page: http://www.mscsoftware.com/about/pdf/qa_statement.pdf
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	Pro-Engineer 2001
b	Area of Applicability (e.g., structural, fire protection)	Structural Design
c	Function of Code	3D Modeling of Special Tooling Designs.
d	Application (what projects/facilities at the site/lab)	Used to Design and Draft Special Tooling.
e	Code Developer and/or Sponsor	Parametric Technology Corporation http://www.ptc.com/
f	Commercial, Proprietary, or Other (Explain)	Commercial
g	Current Owner/Vendor	Parametric Technology Corporation http://www.ptc.com/
h	Technical Support Provider	Parametric Technology Corporation http://www.ptc.com/
i	Code Platform (Workstation, PC-based, Mainframe)	Workstation
j	Operating System	Microsoft Windows 2000 +
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Routine
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	- User's Experience is limited to Offsite training at a PTC or Equivalent Training Facility. - Online Help Exists Thru The PTC's website: http://www.ptc.com/support/support.htm As well as electronic manual's loaded with the software. This 3D modeling Package is already an NWC Standard
Name and phone number of contact: Richard L Ray, x 4665		

Survey Form: Safety Design Software		
a	Code Name and Version	SAFER Version 2.02 (Safety Assessment for Explosives Risk)
b	Area of Applicability (e.g., structural, fire protection)	Explosion Risk Analysis
c	Function of Code	Explosion Risk Analysis
d	Application (what projects/facilities at the site/lab)	Used to assess the risk of explosions to onsite transportation at Pantex Plant
e	Code Developer and/or Sponsor	Developed by APT Research, Inc. Sponsors: DoD Explosives Safety Board, U.S. Army Technical Center for Explosives Safety, U.S. Naval Ordinance Command, U.S. Air Force Safety Center, and U.S. Marines Ammunition / EES.
f	Commercial, Proprietary, or Other (Explain)	Available with permission from DDESB and training provided by APT Research, Inc.
g	Current Owner/Vendor	Developed by APT Research, Inc. Sponsors: DoD Explosives Safety Board, U.S. Army Technical Center for Explosives Safety, U.S. Naval Ordinance Command, U.S. Air Force Safety Center, and U.S. Marines Ammunition / EES.
h	Technical Support Provider	APT Research, Inc.
i	Code Platform (Workstation, PC-based, Mainframe)	PC
j	Operating System	Microsoft Windows
k	Frequency of Use (Routine, repeated use, code of choice - R; Occasional use - O)	Occasional
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	SAFER is in a trial use period. Development is continuing.
Name and phone number of contact: Tom Forker, x6817		

Criticality Codes

	Survey Form:	Safety Design Software
a	Code Name & Version	VISUAL EDITOR: Three-Dimensional Geometry Visualization Code System.
b	Area of Applicability (e.g., structural, fire protection)	VISUAL EDITOR is used to display 3-dimensional (3D) interactive visual graphics of fissile material systems for Nuclear Criticality Safety (NCS) purposes.
c	Function of Code	**Function**: VISUAL EDITOR is an interactive, 3D, geometry modeling code primarily for use with MCNP.
d	Application (what projects/facilities at the Site/Lab	VISUAL EDITOR is used to visually display 3D computer models of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer**: Visual Editor Consultants **Code distributor**: Radiation Safety Information Computational Center (RSICC): http://www-rsicc.ornl.gov/rsicc.html .
f	Commercial, Proprietary, or Other (explain)	**Other**: VISUAL EDITOR is packaged with MCNP Version 5.
g	Current Owner/Vendor	**Distributor**: Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	Users can receive technical support via email: http://www.mcnpvised.com
i	Code Platform (Workstation, PC-based, Mainframe)	**Code**: Visual C++ **Platform**: PC
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Frequency will be Routine use with MCNP.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	User experience is cursory until proficiency is achieved by continuous use. Known errors are published in the manual and listed on the internet at URL: http://www.mcnpvised.com .
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Survey Form:	Safety Design Software	
a	Code Name & Version	KENO V.a module of SCALE 4.4a "Modular Code System for Performing Criticality and Shielding Assessment for Licensing Evaluation".
b	Area of Applicability (e.g., structural, fire protection)	The nuclear criticality safety of fissile materials.
c	Function of Code	**Function:** KENO V.A is used to calculate the k-eff for fissile systems. **Nature of Problem Solved:** It is a multi-group Monte Carlo code used to determine k-eff for fissile systems. **Method of Solution:** The user prepares a single set of input for the criticality module (KENO V.a) of SCALE 4.4a. The input is in terms of easily visualized engineering parameters specified in a simplified, free-form format. The input file is executed via the analytic sequence (CSAS).
d	Application (what projects/facilities at the Site/Lab	KENO V.A is used to analyze the nuclear criticality safety of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer:** Oak Ridge National Laboratory (ORNL) **Code distributor:** Radiation Safety Information Computational Center (RSICC).
f	Commercial, Proprietary, or Other (explain)	**Other:** KENO V.A was prepared by UT-Battelle at the Oak RidgeNational Laboratory (ORNL) under contract number DE-AC05-00OR22725 for the U.S. Department of Energy (DOE). KENO V.A is restricted from distribution to third-parties without a license. KENO V.A is further restricted from distribution for Anti-terrorism (AT) purposes by the U.S. Department of Commerce Title 15 Commerce and Foreign Trade, Chapter VII B Bureau of Export Administration, Parts 730-774, Commerce Control List as OD999 Specific Software.
g	Current Owner/Vendor	**Distributor:** Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	Users can receive technical support at URL: http://www.ornl.gov/scale/scale_notebook.html .
i	Code Platform (Workstation, PC-based, Mainframe)	**Code:** Lahey Fortran 90 version 4.00e and C **Platform:** PC and Workstation
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Frequency will be Routine upon validation and verification (V&V) of the code. Currently, KENO V.a. has not been V&V'd for use at Pantex Plant.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	User's experience is limited to formal off-site training. The user has easily set-up KENO input decks and viewed the geometry. The tutorial manual and the KENO V.A software manual are comprehensive in identifying all the functional requirements and features of the code. Known errors are published in the manual and listed on the internet at URL: http://www.ornl.gov/scale/scale_notebook.html
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Survey Form:	Safety Design Software	
a	Code Name & Version	KENO-3D: A Visualization Tool for KENO V.a. and KENO-VI Geometry Models, Version 2.00.
b	Area of Applicability (e.g., structural, fire protection)	KENO-3D is used to display 3-dimensional (3D) interactive visual graphics of fissile material systems for Nuclear Criticality Safety (NCS) purposes.
c	Function of Code	**Function**: KENO-3D is a powerful state-of-the-art visualization tool that enables KENO V.a. users to interactively display their 3D geometry models of fissile systems. **Method of Solution**: KENO-3D reads KENO V.a. input files and displays the geometry interactively in 3D.
d	Application (what projects/facilities at the Site/Lab	KENO-3D is used to visually display computer models of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer**: Spatial Technology Inc. **Code distributor**: Radiation Safety Information Computational Center (RSICC).
f	Commercial, Proprietary, or Other (explain)	**Proprietary**: KENO-3D provides an interface to ACIS (R) 3D Toolkit. ACIS (R) is a registered trademark of Spatial Technology Inc. ACIS is the sole property of Spatial Technology Inc., and is protected by U.S. copyright laws. The software is CONFIDENTIAL, PROPRIETARY, and a TRADE SECRET, not to be disclosed without written authorization from Spatial Technology Inc.
g	Current Owner/Vendor	**Distributor**: Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	Users can receive technical support via email: scalehelp@ornl.gov .
i	Code Platform (Workstation, PC-based, Mainframe)	**Code**: Microsoft Visual C++ **Platform**: PC only
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Frequency will be Routine upon validation and verification (V&V) of the KENO V.a. code. Currently, KENO V.a. has not been V&V'd for use at Pantex Plant.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	User's experience is limited to formal off-site training. The user has easily set-up KENO-3D input decks and viewed the geometry. The tutorial manual and the KENO-3D software manual are comprehensive in identifying all the functional requirements and features of the code. Known errors are published in the manual and listed on the internet at URL: http://www.ornl.gov/scale/keno3d/enote.html
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Survey Form: Safety Design Software		
a	Code Name & Version	Monte Carlo N-Particle (MCNP) versions 4A, 4B, 4C, 5, and X
b	Area of Applicability (e.g., structural, fire protection)	The nuclear criticality safety of fissile materials.
c	Function of Code	**Function**: MCNP is used to calculate the k-eff for fissile systems. **Nature of Problem Solved**: It is a general-purpose, continuous-energy, generalized geometry, time-dependent, coupled neutron/photon/electron Monte Carlo transport code system. **Method of Solution**: The MCNP code treats an arbitrary three-dimensional configuration of materials in geometric cells bounded by first- and second-degree surfaces and fourth-degree elliptical tori. Pointwise cross-section data are used. For neutrons, all reactions given in a particular cross-section evaluation (such as ENDF/B-VI) are accounted for. Thermal neutrons are described by both the free gas and S(alpha,beta) models. For photons, the code accounts for incoherent and coherent scattering, the possibility of fluorescent emission after photoelectric absorption, absorption in pair production with local emission of annihilation radiation, and bremsstrahlung. A continuous slowing down model is used for electron transport that includes positrons, k-shell x-rays, and bremsstrahlung. Energy ranges are 0-20 MeV for neutrons, 1 keV – 1 GeV for electrons, and 1 keV – 100 GeV for photons.
d	Application (what projects/facilities at the Site/Lab)	MCNP is used to analyze the nuclear criticality safety of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer**: Los Alamos National Laboratory (LANL) **Code distributor**: Radiation Safety Information Computational Center (RSICC).
f	Commercial, Proprietary, or Other (explain)	**Other**: MCNP was prepared by the Regents of the University of California at Los Alamos National Laboratory under contract number W-7405-ENG-36 for the U.S. Department of Energy (DOE). The University retains rights in the MCNP program therefore, MCNP is restricted from distribution to third-parties without a license. MCNP is further restricted from distribution for Anti-terrorism (AT) purposes by the U.S. Department of Commerce Title 15 Commerce and Foreign Trade, Chapter VII B Bureau of Export Administration, Parts 730-774, Commerce Control List as OD999 Specific Software.
g	Current Owner/Vendor	**Distributor**: Radiation Safety Information Computational Center (RSICC) http://www-rsicc.ornl.gov/rsicc.html .
h	Technical Support Provider	A limited amount of free user support is available from John Hendricks, mcnp@lanl.gov and Judi Briesmeister, mcnp@lanl.gov . Users are encouraged to communicate

		with other users via the two list servers, mcnp-l@psi.ch and mcnp-forum@lanl.gov .
i	Code Platform (Workstation, PC-based, Mainframe,	**Code**: Fortran 90 and C **Platform**: PC and Workstation
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Routine (R)
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	MCNP is the software code of choice for determining the neutronic response of fissile materials. The user can easily set-up input decks and view the geometry. The tutorial manual and the MCNP software manual are comprehensive in identifying all the functional requirements and features of the code. Known errors are published in the manual and listed on the internet at URL: http://www-xdiv.lanl.gov/x5/MCNP/forum.html .
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

Survey Form:	Safety Design Software	
a	Code Name & Version	SABRINA: Three-Dimensional Geometry Visualization Code System.
b	Area of Applicability (e.g., structural, fire protection)	SABRINA is used to display 3-dimensional (3D) interactive visual graphics of fissile material systems for Nuclear Criticality Safety (NCS) purposes.
c	Function of Code	**Function**: SABRINA is an interactive, 3D, geometry modeling code primarily for use with MCNP. **Method of Solution**: Rendering is performed by ray tracing or an edge and intersection algorithm. Volume fraction calculations are made by ray tracing.
d	Application (what projects/facilities at the Site/Lab	SABRINA is used to visually display 3D computer models of fissile materials (pits, secondaries, & radioisotopic thermoelectric generators (RTGs)) in storage vaults, weapon assembly/disassembly operations (Bays & Cells), and SNM characterization/requalification facilities.
e	Code Developer and/or Sponsor	**Code developer**: Los Alamos National Laboratory (LANL). **Code distributor**: White Rock Science http://www.whiterockscience.com
f	Commercial, Proprietary, or Other (explain)	**Commercial**: White Rock Science, PO Box 4727 Los Alamos, NM 87544.
g	Current Owner/Vendor	**Distributor**: White Rock Science, PO Box 4727 Los Alamos, NM 87544
h	Technical Support Provider	Users can receive technical support via email: kvr@rt66.com
i	Code Platform (Workstation, PC-based, Mainframe)	**Code**: Fortran 77; ANSI C **Platform**: PC and Workstation
j	Operating System	Windows 2000 on PC platform.
k	Frequency of Use (Routine, repeated use, code of choice – R; Occasional use – O)	Frequency will be Routine use with MCNP.
l	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues.	User experience is cursory until proficiency is achieved by continuous use. Known errors are published in the manual and listed on the internet at URL: http://www.whiterockscience.com .
Name and phone number of contact: Roy R. Hedtke, 806-477-6295 Linda Vickers, 806-477-6617		

National Nuclear Security Administration

Sandia National Laboratories

National Nuclear Security Administration
Sandia Site Office
P O Box 5400
Albuquerque, New Mexico 87185-5400

NOV 1 4 2003

MEMORANDUM FOR Everet Beckner, NA-10, Hqs NNSA

FROM Karen L Boardman, Manager Patty Wagner for

SUBJECT Survey of Design Codes Per 4 2 1 5 Request

The purpose of this correspondence is to respond to your memorandum dated October 16, 2003, requesting site offices to conduct a survey of design codes currently in use to determine if any should be included as part of the toolbox codes The action is in response to the Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2002-1, Quality Assurance for Safety Software at Department of Energy Defense Nuclear Facilities, commitment 4 2 1 5 Attached are electronic mail and survey forms identifying Safety Design Software from Sandia National Laboratories

The duties and responsibilities associated with the implementation of software quality assurance at the Sandia Site Office as per the Implementation Plan have been assigned to the Assistant Manager for Nuclear Facilities and Safety Basis (AMNFSB) The specific responsibilities for software quality assurance, including the fulfillment of the qualification requirements specified by the Federal Technical Capability Panel for the Computer Software Functional Area, will be assigned to a staff member under the direction of AMNFSB

If you have any questions regarding this commitment, please contact Bill Mullen of my staff at (505) 845-5025

Attachment

cc w/attachment
D Nichols, DNFSB
R Singh NA-124, HQ
R Kendall, NA-53, HQ
P Chima, SC
S Walker, SNL MS 1141

cc w/o attachment
R Simonton, SNL, MS 0361
M Blackledge, SNL MS 0638
M Hamilton, NNSA/SSO
W T Mullen, NNSA/SSO
D Ward, SNL, MS 1173

Survey Form: Safety Design Software

A	Code Name and Version	MACCS2 versions 1 12 and 1 16 MELCOR Accident Consequence Code System 2
B	Area of Applicability (e g , structural, fire protection)	Environment, Economic, and Health Impacts of Nuclear Material Plumes, Authorization Basis Analyses, Level 3 PRAs
C	Function of Code	A probabilistic code supporting risk assessments through the calculation of consequences of a nuclear material release MACCS2 can be used to analyze a single weather event or to perform weather trials based on one or more years worth of meteorological data
D	Application (what projects/facilities at the site/lab)	General application to US commercial and research reactors by the U S Nuclear Regulatory Commission Application to transportation accidents by DOE Application to DOE Nuclear Facilities across the complex
E	Code Developer and/or Sponsor	Code Developer Sandia National Laboratories, 6415 Code Sponsor U S Nuclear Regulatory Commission (currently) and U S DOE (formerly)
F	Commercial, Proprietary, or Other (Explain)	Other The last formal release of the code was version 1 12 Updates and release is done by consent of the US NRC through Sandia National Laboratories, Department 6415
G	Current Owner/Vendor	U S Nuclear Regulatory Commission
H	Technical Support Provider	Sandia National Laboratories, Dept 6415
I	Code Platform (Workstation, PC-based, Mainframe)	PC-based
J	Operating System	Windows NT, 2000, XP
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	Routine
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	Extensive experience with the software, currently expanding capability, including development of a user interface, and considering modernization of the code Most users outside of Sandia use the example problems in the user manuals to develop their inputs Extensive experience is needed to develop original inputs Extensive documentation and training available
	Name and Phone number of contact	Dr Nathan Bixler, Org 6415, Sandia National Laboratories, (505)845-3144

Survey Form: Safety Design Software

A	Code Name and Version	MELCOR 1 8 5
B	Area of Applicability (e g , structural, fire protection)	Nuclear Accident Source Term, Level 2 PRA
C	Function of Code	Calculation of the nuclear material source term resulting from a nuclear accident
D	Application (what projects/facilities at the site/lab)	Primary application is the determination of the nuclear material release from an accident at a nuclear reactor or facility This has been applied to both commercial LWR reactors, DOE-complex facilities, DoD bio-hazard analyses
E	Code Developer and/or Sponsor	Code Developer Sandia National Laboratories – 6415 Code Sponsor U S Nuclear Regulatory Commission, Office of Research
F	Commercial, Proprietary, or Other (Explain)	Distribution of the code is controlled by the U S Nuclear Regulatory Commission
G	Current Owner/Vendor	U S Nuclear Regulatory Commission
H	Technical Support Provider	Sandia National Laboratories - 6415
I	Code Platform (Workstation, PC-based, Mainframe)	Workstations and Windows PC-based (Linux under development)
J	Operating System	Unix, Windows, Linux under development
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	Routine
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	Internationally used by nuclear regulators Requires expert operators to generate original inputs Most users adapt models generated by Sandia National Laboratories – 6415 Extensive documentation and training is available
	Name and Phone number of contact	Dr Randall Gauntt, Org 6415, Sandia National Laboratories, (505)284-3989

Survey Form: Safety Design Software

A	Code Name and Version	ABAQUS, Version 6 3
B	Area of Applicability (e g , structural, fire protection)	Mechanical/Structural
C	Function of Code	Finite Element Analysis (FEA)
D	Application (what projects/facilities at the site/lab)	Tiedowns in NNSA/Office of Secure Transportation (OST) vehicles used to transport nuclear explosives and nuclear materials
E	Code Developer and/or Sponsor	Vendor
F	Commercial, Proprietary, or Other (Explain)	Commercial
G	Current Owner/Vendor	Vendor
H	Technical Support Provider	Vendor
I	Code Platform (Workstation, PC-based, Mainframe)	Multi-platform
J	Operating System	Multi-OS
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	O
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	Just beginning to use, includes Software QA, has website for QA http //www abaqus com/products/products_qa html and error reporting http //www abaqus com/forms/ts_status-reports html
	Name and Phone number of contact	Jeff Gruda, Sandia National Laboratories, (505) 844-9782

Survey Form: Safety Design Software

A	Code Name and Version	COSMOS, Version 2 8 2003/095
B	Area of Applicability (e g , structural, fire protection)	Mechanical/Structural
C	Function of Code	Finite Element Analysis (FEA)
D	Application (what projects/facilities at the site/lab)	Tiedowns in NNSA/Office of Secure Transportation (OST) vehicles used to transport nuclear explosives and nuclear materials
E	Code Developer and/or Sponsor	Vendor
F	Commercial, Proprietary, or Other (Explain)	Commercial
G	Current Owner/Vendor	Vendor
H	Technical Support Provider	Vendor
I	Code Platform (Workstation, PC-based, Mainframe)	Multi-platform
J	Operating System	Multi-OS
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	O
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	Vendor provides excellent training, have been able to successfully apply COSMOS to tiedown design problems
	Name and Phone number of contact	Ken Padilla, Sandia National Laboratories, (505) 844-2412

Survey Form: Safety Design Software

A	Code Name and Version	**Integrated Tiger Series Ver. 5.0**
B	Area of Applicability (e g , structural, fire protection)	**Radiation Effects Gamma**
C	Function of Code	**Coupled electron/photon radiation transport (1-D, 3-D).**
D	Application (what projects/facilities at the site/lab)	**Auxiliary Hot Cell Facility/Various design and analysis of experiments associated with accelerators**
E	Code Developer and/or Sponsor	**SNL/Radiation Effects**
F	Commercial, Proprietary, or Other (Explain)	**Other – In-house (currently under copyright assertion considerations)**
G	Current Owner/Vendor	**SNL; RSICC for Ver. 3.0**
H	Technical Support Provider	**SNL**
I	Code Platform (Workstation, PC-based, Mainframe)	**Various**
J	Operating System	**Various**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Occasional**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	**Users manual available; no physics manual available.**
	Name and Phone number of contact	**Ron Kensek, 505-845-7642**

Survey Form: Safety Design Software

A	Code Name and Version	ADEPT Ver. ??
B	Area of Applicability (e g , structural, fire protection)	Safety, Shielding
C	Function of Code	One Dimensional Electron-Photon Transport by Discrete Ordinates
D	Application (what projects/facilities at the site/lab)	Nuclear Facilities – Gamma Electron Beam Shielding
E	Code Developer and/or Sponsor	SNL
F	Commercial, Proprietary, or Other (Explain)	Other – In-House
G	Current Owner/Vendor	SNL
H	Technical Support Provider	None
I	Code Platform (Workstation, PC-based, Mainframe)	Any
J	Operating System	Any
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	Occasional
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	Len Lorence, 505-845-7066

Survey Form: Safety Design Software

A	Code Name and Version	**MCNP Ver. 5**
B	Area of Applicability (e g , structural, fire protection)	**Safety – Shielding, Nuclear Criticality**
C	Function of Code	**Photonic/Neutronic – Monte Carlo shielding/criticality**
D	Application (what projects/facilities at the site/lab)	**Nuclear Facility Safety Analysis**
E	Code Developer and/or Sponsor	**RSICC** Radiation Safety Information Computational Center (RSICC)
F	Commercial, Proprietary, or Other (Explain)	**Commercial**
G	Current Owner/Vendor	**RSICC**
H	Technical Support Provider	**RSICC**
I	Code Platform (Workstation, PC-based, Mainframe)	**PC-Based, UNIX**
J	Operating System	**Windows/DOS, UNIX, LINUX**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Repeated Use**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that is currently available in DOE's RSICC; Sandia nominates this code for toolbox consideration]**

Survey Form: Safety Design Software

A	Code Name and Version	**ANITA Ver. 2000**
B	Area of Applicability (e g , structural, fire protection)	**Safety**
C	Function of Code	**Activation Analysis**
D	Application (what projects/facilities at the site/lab)	**Annular Core Research Reactor** **Sandia Pulsed Reactor**
E	Code Developer and/or Sponsor	**Commission of the European Communities**
F	Commercial, Proprietary, or Other (Explain)	**Commercial**
G	Current Owner/Vendor	**CEC/RSICC** Radiation Safety Information Computational Center (RSICC)
H	Technical Support Provider	**None**
I	Code Platform (Workstation, PC-based, Mainframe)	**PC-Based, UNIX**
J	Operating System	**Windows/UNIX**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Occasional**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that is currently available in DOE's RSICC; Sandia nominates this code for toolbox consideration]**

Survey Form: Safety Design Software

A	Code Name and Version	**CINDER Ver. 90**
B	Area of Applicability (e g , structural, fire protection)	**Safety**
C	Function of Code	**Fission Product Decay & Activation Analysis**
D	Application (what projects/facilities at the site/lab)	**Annular Core Research Reactor Sandia Pulsed Reactor**
E	Code Developer and/or Sponsor	**LANL**
F	Commercial, Proprietary, or Other (Explain)	**Other**
G	Current Owner/Vendor	**LANL (RSICC?)** Radiation Safety Information Computational Center (RSICC)
H	Technical Support Provider	**LANL**
I	Code Platform (Workstation, PC-based, Mainframe)	**Any**
J	Operating System	**Any**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Occasional**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that was developed at LANL but is also in use at Sandia; Sandia nominates this code for toolbox consideration]**

Survey Form: Safety Design Software

A	Code Name and Version	**DKPOWR Ver. ??**
B	Area of Applicability (e g , structural, fire protection)	**Safety and Design**
C	Function of Code	**Calculates fission product, Electron Generation, Photon Generation, & Heat Generation following a shutdown.**
D	Application (what projects/facilities at the site/lab)	**Design of Cooling Systems** **Safety Analysis – Heat Removal Post Accident**
E	Code Developer and/or Sponsor	**LANL**
F	Commercial, Proprietary, or Other (Explain)	**Other - ?**
G	Current Owner/Vendor	**LANL**
H	Technical Support Provider	**None needed**
I	Code Platform (Workstation, PC-based, Mainframe)	**PC**
J	Operating System	**Windows/DOS**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Repeated**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that was developed at LANL but is also in use at Sandia; Sandia nominates this code for toolbox consideration]**

Survey Form: Safety Design Software

A	Code Name and Version	**SCALE Ver. 4.4A**
B	Area of Applicability (e g , structural, fire protection)	**General Reactor Safety Analysis including shielding and criticality.**
C	Function of Code	**See above**
D	Application (what projects/facilities at the site/lab)	**Nuclear Facility Safety**
E	Code Developer and/or Sponsor	**Oakridge**
F	Commercial, Proprietary, or Other (Explain)	**Commercial**
G	Current Owner/Vendor	**Oakridge/RSICC**
H	Technical Support Provider	**Oakridge**
I	Code Platform (Workstation, PC-based, Mainframe)	**Any**
J	Operating System	**Any**
K	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Occasional**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that was developed at OakRidge but is also in use at Sandia; Sandia nominates this code for toolbox consideration]**

Survey Form: Safety Design Software

A	Code Name and Version	**PARTISN Ver. 2.99**
B	Area of Applicability (e g , structural, fire protection)	**Safety**
C	Function of Code	**Radiation Transport**
D	Application (what projects/facilities at the site/lab)	**All Nuclear Facilities**
E	Code Developer and/or Sponsor	**LANL**
F	Commercial, Proprietary, or Other (Explain)	**Commercial**
G	Current Owner/Vendor	**LANL/RSICC**
H	Technical Support Provider	**LANL**
I	Code Platform (Workstation, PC-based, Mainframe)	**UNIX**
J	Operating System	**UNIX**
`	Frequency of Use (Routine, repeated use – R, Occasional use – O)	**Occasional**
L	Comments on experience with this software, ease of application, adequacy of documentation provided, known errors or issues	
	Name and Phone number of contact	**[Note: this is a code that was developed at LANL but is also in use at Sandia; Sandia nominates this code for toolbox consideration]**

National Nuclear Security Administration

Savannah River Site
(Refer to Item 1.c under DOE/EM)