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Information continued from Scientific Notebook 403

Project Name: Development of Preclosure Safety Analysis Tool

Project Number: 20.06002.01.103

Principal Investigator: Biswajit Dasgupta, ext 6815
George Adams

George Adams is the primary holder of this scientific notebook.

George Adams September 19, 2003

Scientific Notebook entries are continued from Scientific Notebook 403. This scientific notebook documents the continued activities for the development of the Preclosure Safety Analysis Tool (PCSA Tool). Personnel involved in this activity are:

David Stead
Albert Lozano
George Adams (Primary holder of scientific notebook)
Roland Benke
Biswajit Dasgupta

The objectives of this task and personnel ~~qualifications~~ George Adams 9-19-2003 qualifications and skills are described in the initial entry section on page 1 of scientific notebook 403.

* George Adams July 1, 2005: Personnel qualifications and objectives added to page 74

Albert S. Lozano
9/24/2003

3/25/2003 to 9/24/2003

During this period I worked on a part time basis on this project. Most of the work consists of changes to upgrade the tool from Version 2.0 to Version 3.0. The project tree view was modified to allow the user to expand the entire tree or collapse the tree; however, the selected branch always remains expanded (SCR 431). I also worked on early versions of the Crystal Reports for the consequence module. These were later modified by George Adams. One report was for the RSAC input parameters another was a report including a line plot for the data for a CCDF. A third was a report including a bar chart for the summary data (SCR 435). I began work on the log file task. The name of the user is obtained using a system call when PCSA Tool begins to run. The name is stored in a global variable (SCR 431). I also worked with George on the integration of RSAC 6.1 with the tool (SCR 435). I also worked with George on the integration of pcsa_prob.exe a.s. 9/24/2003 and pcsa_lhsinp.exe, fortran executables. SCR 437. ——— Albert S. Jogano

——— 9/24/2003

George Adams September 6, 2003 - October 2, 2003

Performed a series of PCSA Tool updates identified in the table below:

SCR	Submission	Description
432	9-17-03	Added Crystal Report for the Safety Analysis module Files updated: frmResultsTable Files created: frmCrystalResultsTable, CrystalResultsTable.dca, .dsr, .dsx CrystalResultsTable.rpt
437	9-22-03	Added Crystal Reports to the Risk Analysis Module Files updated: frmRiskResults.frm, .frx Files created: CrystalRiskResultsGraph.DCA, DSR, DSX, RPT CrystalRiskResultsTable.DCA, DSR, DSX, RPT frmCrystalRiskResultsTable.frm frmCrystalRiskResultsGraph.frm Files removed: CrystalRiskResults.DCA, DSR, DSX frmCrystalRiskResults.frm CrystalOutcomeReport.DCA, DSR, DSX Database: Table RiskTotalCCDF modified field name XValue and Probability from text to number (double)
436 pcsa_comban	9-29-03	Input character string would be cutoff, modified from 8 to 15. Added the capability to display error messages when the output file could not be created. The input information needed to be sorted; however, the VB code did not provide sorted input. This resulted in some of the input information being excluded. Code was modified to sort the input. Enabled the code to generate results for the first 50,000 combinations. Reformatted the output to keep names from running together.

Design Memo September 6, 2003 - October 2, 2003 (continued)

SCR	Submission	Description
437	9-29-03	Modified function zportsh to increase the character string from
zportpc		99 characters to 122
		Added subroutines zportcheckdir, zportmakefname, zportcheckfiles
		Added function zportrimlen
437	9-29-03	Modified to allow a 5-digit number instead of a 4-digit number to
pcsa_totrisk		be appended to the output file. Corrected run-time errors occurring with
		LF95 build.
tcclf.i		Increased MSMAX to allow a larger number of path names than just 8
435	9-29-03	Corrected data input from the lhsinp.dat file at the 'PARAMETERS' field
pcsa_lhsinp		The number of parameter values did not correspond to the actual number
		of parameters in the file
435	9-29-03	Upgraded RSAC to version 6.1
pcsa-prob		Corrected an error reading groundbel.dat. The actual number of radionuclides
		would not match the expected number when inventory was zero
pcsarsac.i		Modified dimensions from 20 to 30 for inhalation and ingestion for the
		upgrade to Version 6.1
pcsa_rsacrdf		Upgraded to RSAC Version 6.1
435, 436, 437	9-29-03	Modified to build on LF95.
make files		Files Affected:
		makepcsa_totrisk.bat
		makepcsa_comban.bat
		makepcsa_lhsinp.bat
		makepcsa_rsacrd.bat
		makepcsa_prob.bat

Doug Adams September 6, 2003 - October 2, 2003 (CONTINUED)

SCR	Submission	Description
437	9-29-03b	The TotalRisk directory would not be created when required. The code was modified to create directory TotalRisk\prb and TotalRisk\bet. Files updated: frmRiskAssessment.frm, frx
431	10-2-03	Created the system logging capability. If entries were previously made, then the system log is displayed on startup. Also, if entries were previously made, the user is required to make an entry on exit. Files updated: frmStartup.frm, frx MDI_PCSA_Frm1.frm, frx mdlYmpmodule1.bas Files created: frmSystemLog.frm, frx frmSystemLogEntry.frm Database: Added Systemlog table

Doug Adams October 2, 2003

Mark Silliman started working on PCSA Tool development from August 18, 2003. He will make entries into this scientific notebook

Mark Silliman October 9, 2003

Mark Silliman August 18, 2003 – October 9, 2003

During this time period I worked part time on the PCSA Tool. The work consists of three projects.

1. SDM (System Description Module). SCR # 432. Added files frmOperationSequence.frm.
2. Began programming Merge application which will allow a user to merge two databases into a new database. This application was left unfinished to work on the third project. Work on this project will continue directly after project three is completed.
3. Programming a conversion tool to convert old database formats to the new database format (allowing users who used older versions of the PCSA Tool to move their data to the newest version of the PCSA Tool). Work for this is in progress.

Oct 9,03 Mark Silliman

Doug Adams October 3, 2003 - October 16, 2003

SCR	Submission	Description
434	10-16-03	Level 1 would not display on the Crystal Initiating Event Report if the description was blank. File Updated: frmCrystalInitiatingEvent.frm
434	10-16-03	~~Ada~~ Doug Adams 10-16-03 Added Crystal Report for Event Tree Files updated: frmEventTree.frm, frx Files created: frmCrystalEventTree.frm CrystalEventTree.dca, dsx, dsr, rpt Database: Template.mdb, Added EventTree_Report table which is a copy of the EVG_REPORT table

Doug Adams October 16, 2003

DNA 10-22-03

Nancy Adams October 17, 2003 - ~~October 20, 2003~~ October 22, 2003

SCR	Submission	Description
434	10-20-03	Added Crystal Reports for Fault Tree and Fault Tree Events Files updated: frmFaultTree.frm frmFaultTreeEventTable.frm,frx Files created: frmCrystalFaultTree.frm frmCrystalFaultTreeEvents.frm CrystalFaultTree.dca,dsr,dsx,rpt CrystalFaultTreeEvents.dca,dsr,dsx,rpt
434	10-22-03	Added Crystal Report for Event Sequences Files Updated: frmEventSequenceForm.frm frmEventSequenceTable.frm,frx Files Created: frmCrystalEventSequence.frm CrystalEventSequence.dca,dsr,dsx,rpt
435	10-22-03	Replaced the rsac6.bat files located in the tools directory and the tools\rsac6adv directory with corrected versions of these files. The rsac6.bat file located in the tools directory was referring to rsac5 files. Also, the rsac6.bat file located in the tools\rsac6adv directory was a copy of the one in the tools directory. It needed to be a different file from the one in the tools directory.

Nancy Adams November 5, 2003

Doug Adams October 23, 2003 - November 5, 2003

Doug Adams 11-5-03

~~DATE~~	~~SCR/DIRECTORY~~	~~DESCRIPTION~~
SCR	Submission	Description
431	10-24-03	Added Project Tree Crystal Report
		Removed SAPHIRE Location from Level Description form
		Files Created: frmCrystalProjectTree
		CrystalProjectTree.dsx, dsr, dca, rpt
		Files Modified: frmLevelDescription.frm
		frmProjectTreeView.frm
435	10-27-03	Added an error log file to the pcsa_prob FORTRAN code module.
		Previously, when the FORTRAN code would abort due to invalid
		input such as ∅ inventory for all radionuclides, it was difficult
		to track down the source of the error.
		Files updated: pcsa_prob.f, exe
		frmReadRSAC.frm
		frmViewRSACFiles.frm
		rsac6.bat (tools directory)
		rsac6det.bat
		rsac6prb.bat
434, 436	10-28-03	Modified the Frequency Analysis menu and the Performance
		Assessment menu to accomodate public and worker forms
		Files updated: MDI_PCSA_Frm1.frm, frx
437, 435	10-29-03	Corrected an error creating PCSA_tatrisk.bat file. VB code was
		placing files in an incorrect directory \prob\prob or \detl\det.
		Files updated: frmRiskAssessment (change previously placed in
		submission 9-29-03b but not implemented)
		Modified pcsa_prob.f to create a single ccdf file (ccdfcomb.dat)

Doug Adams October 23, 2003 - November 5, 2003 (continued)

SCR	Submission	Description
433	11-3-03	Added FMEA Crystal Report
		Files updated: ~~CrystalFMEA.dsx, dsr, dca, rpt Doug Adams 11-5-03~~
		~~frmCryst Doug Adams 11-5-03~~
		frmSELTable.frx, frm
		frmMDIFMEATable.frm, frx
		frmFMEAForm.frm
		Files created: CrystalFMEA.dsx, dsr, dca, rpt
		frmCrystalFMEA.frm
433	11-4-03	Added WhatIf Crystal Report and added subroutine
		gSetLevelDescriptions to mdlYMPmodule1
		Files updated: frmMDIWHATIFTable.frm, frx
		frmWhatIFSELTable.frm, frx
		frmWhatIFForm.frm
		mdlYMPmodule1.bas
		Files created: CrystalWhatIf.dsx, dsr, dca, rpt
		frmCrystalWhatIF.frm
433	11-5-03	Added Energy Method Crystal Report
		Files updated: frmEnergyAnalysisTable.frm, frx
		frmEnergyAnalysisForm.frm
		frmEnergyAnalSELTable.frm, frx
433 (continued)	11-5-03 (continued)	Files created: CrystalEnergyMethod.dsx, dsr, dca, rpt
		frmCrystalEnergyMethod.frm

Doug Adams November 20, 2003

George Adams November 6, 2003 - November 20, 2003

~~DATE~~ SCR	Submission	Description
435	11-10-03	Added Crystal Report for RSAC CCDF
		Files Updated: frmRSACCCDF.frm, frx
		Files Created: Crystal RSACCCDF.dsx, dsr, dca, rpt
		frmCrystalRSACCCDF.frm
		Files Removed: CrystalCCDF.dsx, dsr, dca, rpt
		CrystalCCDFWithData.dsx, dsr, dca, rpt
		frmCCDFReport.frm
		frmCCDFReportWithData.frm
435	11-10-03b	Updated Crystal Report for RSAC Output
		Files Updated: frmRSAC_Output.frm, frx
		Files Created: CrystalRSACOutput.dsx, dsr, dca, rpt
		frmCrystalRSACOutput.frm
		Files Removed: frmRSACOutputReport.frm
433	11-11-03	Added Crystal Report for Human Reliability Analysis
		Files Updated: frmHRA_SQLTable.frm, frx
		frmHRAForm.frm, frx
		frmHRATable.frm, frx
		Files Created: CrystalHRA.dsx, dsr, dca, rpt
		frmCrystalHRA.frm
436	11-19-03	Added combinations of event sequences to the VB code in place
	pcsa_comban	of standalone FORTRAN code module pcsa_comban
		Files modified: frmSafetyAssessment
		Files Created: frmSafetyAssessmentCombinations.frm, frx
		Files Removed: pcsa_comban.f, .exe
		comban.bat

Doug Adams November 21, 2003 - December 10, 2003

SCR	Submission	Description
435	11-21-03 pcsa_prob	Modified pcsa_prob.f to no longer generate individual ccdf files for individual organs Files updated: pcsa_prob.f, exe
435	11-24-03 pcsa_prob	Modified pcsa_prob.f to add dose by radionuclide and pathway summary information to ccdfcomb.dat file. Files Updated: pcsa_prob.f, exe
435	12-1-03 pcsa_prob	Added graphical plots of radionuclide contributions to ccdf and dose. Files Updated: frmCrystalRSACOutput.frm frmReadRSAC.frm frmRSAC_Output.frm, frx frmRSACCODE.frm, frx pcsa_prob.f, exe pcsarsac3.i Database Update: Changed the names of two fields in table RSAC_OUTPUT. Changed field Organs to field Component. Changed field Organ Number to field Number.
435	12-2-03	Modified the Crystal Report for RSAC_OUTPUT to display bar graphs for radionuclides. Files Updated: CrystalRSACOutput.dca, dsr, dsx, rpt frmCrystalRSACOutput.frm

Doug Adams December 10, 2003

~~Doug Adams~~ DAA 11-20-03

Doug Adams November 21, 2003 - December 10, 2003 (continued)

SCR	Submission	Description
435	12-4-03	Integrated multi series CCDF plots into RSAC module. ~~The~~ DAA 12-10-2003 The multi series plots show radionuclide contributions for the top 3 radionuclides. Files Updated: CrystalRSACCCDF.dca, dsr, dsx, rpt frmCrystalRSACCCDF.frm frmRSACCCDF.frm, frx
435	12-7-03	Modified the RSAC Output and RSAC CCDF plots to make them appear more uniform. Files Updated: frmCrystalRSACOutput.frm CrystalRSACOutput.rpt, dsx, dsr, dca CrystalRSACCCDF.rpt, dsx, dsr, dca
437	12-8-03	Added mean consequence and mean risk numeric values to probabilistic risk results Files Updated: frmRiskResults.frx, frm frmCrystalRiskResultsTable.frm CrystalRiskResultsTable.dsr, dsx, dca, rpt Database Update: Added fields Mean Consequence and Mean Risk to table Risk_Outcome
434	12-9-03	Modified Initiating Event Crystal Report to remove material at risk and added material at risk to Event Tree Crystal Report. Files Updated: CrystalEventTree.dca, dsr, dsx, rpt CrystalInitiatingEvent.dca, dsr, dsx, rpt frmCrystalEventTree.frm

Doug Adams November 21, 2003 - December 10, 2003 (continued)

SCR	Submission	Description
434 (continued)	12-9-03 (continued)	Files Updated: frmCrystalInitiatingEvent.frm Database Updates: Added Mat'l at Risk to EventTree_Report table Removed Mat'l at Risk from InitEventTable.
433	12-10-03	Added Crystal Report for Severe Events. Files Updated: frmSevereEvents.frm, frx frmSystemLog.frm, frx mdlYMPModule1.bas Files Created: CrystalSevereEvents.dca, dsx, dsr, rpt frmCrystalSevereEvents.frm

Doug Adams December 10, 2003

Changes to PCSA Tool software. 9/16-12/23/2003, D. STEAD.

Changes to PCSA Tool software, from 09/16/2003 to 12/23/2003:

Changes common to all forms/reports:
1. Renamed several variables to conform with our coding standards.
2. On most MSFlexGrids, changed from .TextArray to .TextMatrix property, and removed 'faIndex' functions associated with the .TextArray property.
3. Integrated new Crystal Reports for several forms, provided by George Adams, and removed report subs in mdlYMPModule1 associated with old VB reports.
4. mdlYMPModule1:
Added 'gInitGlobals()' to initialize values of some global variables. It is called from mdifrmMain upon loading.

SCR431, System Log Module:
Modified GUIs and integrated frmSystemLog and frmSystemLogEntry, created by G. Adams.

SCR432, System Description Module:
frmSystemDescription:
This form was created by Mark Silliman to replace frmSysDescr, which has now been removed from the project. I made many GUI changes, added error handlers, .EOF checks, data control initialization, etc. This form is still under development.

SCR433, Hazard Analysis Module:
1. frmFMEAForm, frmFMEATable, frmHRAForm, frmHRATable, frmWhatIfForm, frmMDIWhatIfTable:
Added 'Effect on other Functional Areas', w/'Interaction' buttons, new fields: 'Inter- action', and 'Effect on other FAs'.

2. frmFMEAForm, frmHRAForm, frmWhatIfForm:
Changed to 'gbDataEntryExists()' in 'cmdAddRec_Click()' to check if new item numbers already exist before saving a new record.

P. Stead 12/23/03

continued

3. Main MDI Form (mdifrmMain):
Removed direct access from menu to table-view forms (frmMDIFMEATable, frmMDIWhatIfTable, frmHRATable, frmEnergyAnalysisTable).

SCR434, Frequency Analysis Module:

1. frmEditTables:
Modified to work with new Event Tree form; added option buttons for the selection of 'Linking' (None, Fault Tree, or HRA). When adding or copying a record in a table-view form, the letter 'N' is put in single-character fields by default (meaning No or None). Added code to remove a '-' or '?' from a field-name string before copying it to this form's caption. This is to make fields that were hyphenated for better display in a narrow column header appear legibly in the caption (i.e., field 'Uncer-tainty' becomes 'Uncertainty'), and to avoid having two question marks appear in the caption. Modified to work with the Public / Worker / Both selection field in the Event Sequence table form, using the 'Linking' selection buttons.

2. frmEnterNewID:
Added caption to prompt user "Enter <field name>", unload if invalid entry.

3. frmEventSequenceForm:
Modified code to handle the new Event Tree tables. Initial mods for Worker Dose mode were made using separate tables, but it was decided that it would be better to use the same table for both Public and Worker dose, with a field indicating Public, Worker, or Both in the original EventSequence table. Added a boolean flag to indicate when data is updating to avoid problems in the data control's 'reposition' event sub. Changed to 'gbDataEntryExists()' in 'cmdAddRec_Click()' to check if new item numbers already exist before saving a new record.

J. Stew 12/23/03

continued

4. frmEventSequenceTable:
Modified code for Worker Dose, as in frmEventSequenceForm. Widened form to display more data without scrolling, which requires 1024x768 or better display resolution to see the whole form on screen.

5. frmInitEventForm:
Added code to automatically recategorize affected Event Sequences when an Initiating Event parameter has changed. Added code to enable/disable the drop-down combo boxes during/after editing. Modified to work with new Event Tree tables.

6. frmInitEventTable:
Get new ID for all added records. Modified to work with new Event Tree tables. Added code to clear 'Uncertainty Info' field if the 'Uncertainty?' field becomes 'N' after editing in 'EditAnalysisData()'.

7. frmEventTree:
This is a new form that replaces 'frmEventScenario.frm'. It has a tabbed design with a 'form' view for Event Scenarios and a table view for Subsequent Events. This form was modified for a Worker Dose mode, but that mode has now been removed.

8. mdlYMPModule1:
Added constants for the Event Tree and Event Sequence tables, providing single-point definitions of their database table names. Added 'gRecategorizeEvSeqs()', called by the Initiating Event Form when data changes to automatically recategorize the associated Event Sequences. Added 'gDeleteRecordFromTable()' to delete records from table-view forms (implemented on all applicable table-view forms in Frequency Analysis and Internal Hazard Analysis). Removed unused subs (mostly old VB reports). Added Worker Dose mode Event Sequence and Results forms, at the request of G. Adams. Added 'glGetTotalRowHeight()' and 'gbGridIsFull_wVertScrollBar()' to remedy a problem where after deletion of an Event Sequence with the grid full (showing enough events to make a vertical scroll bar appear, but no longer full

R. Hall 12/23/03

continued

after the event was deleted), the previous event would be highlighted and become the first line in the grid, but the scroll bar would disappear, preventing the user from scrolling up to see the events with a lower item number. This change also applies to all other table-view forms that function similarly.

9. Main MDI Form (mdifrmMain):
Made various changes in menu and associated subs to accomodate worker dose mode, removed direct access from menu to table-view forms (frmInitEventTable, frmEventSequenceTable).

SCR435, Consequence Analysis Module:
1. frmReadRSAC:
Added error handler in 'ReadRSACLHSOutputFile()'.

2. frmRSAC_Output:
Added code to save an RSAC run in a database file, which is a copy of the working database with the other PCSA tables (all but RSAC tables) removed. Added code to retrieve a saved RSAC run from the saved RSAC database file to the current working database. This involves copying the input parameters from their tables without disturbing the default values, and copying the complete RSAC output tables. Also, the old RSAC_CCDF table was replaced with an RSAC_CCDF_Output table, which stores all CCDF data, including the pathway/organ-specific data that was previously saved in individual '.DAT files. This table is loaded in 'ReadCCDFcomboFile()' from the individual .DAT CCDF files. This eliminates the need to copy all the .DAT files to the saved run's directory. The GUI was revised for better function and appearance. In 'RefreshAll()' the generation SQL statements was streamlined, and code was added to set the column widths in the grids for better readability. Made changes to allow the CCDF plots to be generated directly from the RSAC_CCDF_Output table, rather than by copying from the ccdfxxxx.dat files first. Integrated changes for multiple CCDF plot data sets (done by G. Adams).

R. Hoo 12/23/03

continued

3. frmRSACCCDF:
Changed code to load plot directly from 'RSAC_CCDF_Output' database table.

4. frmRSACInput:
Added radionuclide summary by pathway, adjusted grid column widths.

SCR436, Safety Analysis Module:
1. frmResultsTable:
Added code to display Frequency Weighted Doses and Total FWD for probabilistic or deterministic results displayed from a category 1 search. Modified for Worker Dose, similar to Event Sequence, but with Public or Worker dose mode selected at the main menu. Events applicable to Public, Worker, or Both are shown, depending on the contents of the 'P W B' field.
Editing is now allowed for selecting a dose or a consequence path, regardless of whether the event is DOE or not, including probabilistic dose/path.
An 'Additional Info' field was added which displays only in the Results table form, and is differentiated from a field of the same name in Event Sequence by the addition of an unprintable character.
The SQL query was modified join with the 'EventTree_Master' and 'InitEventTable' to enable showing the 'DOE' (Y/N) field.
Additional SQL modifications were made to show only deterministic data in Worker Dose mode, and to show the frequency weighted dose data only after a Category 1 search has been done in Safety Assessment mode.
Added an error handler and data control initialization & record count code. Added code to set column widths in grid to suit the fields displayed, in all display configurations (project-wide/fct.area-specific). The form was widened to display more data without scrolling, and now requires 1024x768 screen resolution.

12/23/03

2. frmResultsTableSSCITS:
Modified for compatibility with the modified search form (frmSearchForm).

3. frmSafetyAssessment:
Added code to save the last Normal Release value entered. Added code to show release values (rem) to only 5 decimal places. Removed Time Out Timer (no longer used, comban code is now in VB).

4. frmSafetyAssessmentSSCITS:
Added code to save the last Normal Release value entered.

5. frmSearchForm:
Modified form with option buttons to select the category, rather than entering '1', '2', or 'BCFL' in a text box, as before.

6. mdlYMPModule1:
Added 'gdLastNormalRelease' to save the last value entered in the 'Normal Release' box on the Safety Assessment forms, to avoid the user having to re-enter it each time a calculation is made.

SCR437, Risk Assessment Module:
1. frmRiskAssessment:
Modified to work with new Event Tree tables, including a sub to check if an Initiating Event is a DOE event or not. Added .MoveLast to assure an accurate .RecordCount value.

SCR438, SSC Important to Safety Module:
1. frmEditTables:
Modified to handle SSC data, w/drop-down list box for SSC selection.

2. frmEventSequenceForm:
Added code to fix problems with SSC data, including code to clear the SSC list box and adding Worker Dose mode. Added code to enable/disable the Good/Fail buttons for SSCs.

3. frmSSC_Data:
Finished coding form, including add & delete subs for the design-view tables (tabs 1 & 2). Changed to 'gbDataEntryExists()' to check for duplicate item numbers.

David A. Haas 12/23/2003

Doug Adams December 11, 2003 - February 9, 2004

SCR	Submission	Description
435	12-18-03	Moved HEPA Mitigation Factor to the Group tab of the RSAC Input form. This change allows the user to enter HEPA Mitigation Factors for each group. Files Updated: frmRSACInput.frm, frx mdlTypeModule1.bas Database Update: modified RSAC_GroupReleaseFractions table to add HEPA mitigation and default fields Removed HEPA fields from the RSAC GeneralInput table but kept the HEPA Operative radio button field.
432	1-9-04	Added Crystal Reports to the System Description form Files Updated: frmSystemDescription.frm, frx Files Created: CrystalFireHazards.dca, dsr, dsx, rpt CrystalFunction.dca, dsr, dsx, rpt CrystalHumanActions.dca, dsr, dsx, rpt CrystalOperationSequence.dca, dsr, dsx, rpt CrystalShielding.dca, dsr, dsx, rpt CrystalSoftwareSystem.dca, dsr, dsx, rpt CrystalWasteCharacterization.dca, dsr, dsx, rpt frmCrystalFireHazards.frm frmCrystalFunction.frm frmCrystalHumanActions.frm frmCrystalOperationSequence.frm frmCrystalShielding.frm frmCrystalSoftwareSystem.frm

George Adams December 11, 2003 - February 9, 2004 (continued)

SCR	Submission	Description
432 (continued)	1-9-04 (continued)	frm Crystal Waste Characterization.frm Database Update: Added table Sys_Human Actions Modified table Sys_miscFields Removed tables Sys_Maintenance & Standby and Sys_Operational
433	1-14-04	Added Crystal Reports to the External Events form Files Updated: frm External Events.frm, frx frm Ext Event Analysis.frm Files Created: Crystal External Events.dca, dsr, dsx, rpt Crystal External Events Detail.dca, dsr, dsx, rpt frm Crystal External Events.frm frm Crystal External Events Detail.frm
436	1-27-04	Replaced the Crystal Reports in Performance Assessment for both Current Level Results and Project Results. Files Updated: frm Results Table.frm, frx Files Created: Crystal Results Table Current.dca, dsr, dsx, rpt Crystal Results Table Project.dca, dsr, dsx, rpt frm Crystal Results Table Current.frm frm Crystal Results Table Project.frm Files Removed: Crystal Results Table.dsx, dsr, dca frm Crystal Results Table.frm Database Update: modified the Event Sequence table. For the mean dose, "_" was added to Freq * Dose and % Also, "_" was added to Additional_Info Formerly hidden characters were used.

George Adams December 11, 2003 - February 9, 2004 (continued)

SCR	Submission	Description
431, 434	02-02-2004	Corrected the System Log functionality so that the System Log form appears when the user performs a save while using the Tool but then decides to not perform a save on exit. Also, updated the EventTree_Report table to include a Material At Risk field.
436		Added highlighting to the Crystal Report Results table.
438		Added close buttons to the Design Bases and Design Criteria tabs.
432		Updated the Operation Sequence Crystal Report so that field headers agree with the report.
		Files Updated: CrystalEventTree.dca, dsr, dsx, rpt
		CrystalOperationSequence.dca, dsr, dsx, rpt
		CrystalResultsTableProject.dca, dsr, dsx, rpt
		frmCrystalResultsTableProject.frm
		frmSSC_Data.frm, frx
		MDT_PCSA_Frm1.frm, frx
		Database Update: Added field Mat'l at Risk to table
		EventTree_Report
436	02-03-2004	Added Crystal Report to the Safety Assessment Combinations form and corrected an error in the form where combinations [2x,4] were not all generated
		Files Updated: frmSafetyAssessmentCombinations.frm, frx
		Files Created: CrystalSafetyAssessmentCombinations.dca, dsr, dsx, rpt

George Adams February 9, 2004

Diego Adams December 11, 2003 - February 9, 2004 (Continued)

SCR	Submission	Description
435, 436	02-04-2004	Added the Normal Operation Dose form Files Updated: frm Safety Assessment. frm MDI_PESA_Frm1. frm, frx mdlYMP Module1. bas Files Created: frm Normal Operation Dose. frm Database Update: Added table Normal Operation Dose
436	02-05-2004	Added a separate Safety Assessment form for the Worker Dose Files Updated: frm ResultsTable. frm, frx frm Safety Assessment. frm frm Safety Assessment Combinations. frm, frx Files Created: frm Safety Assessment Worker. frm
		Diego Adams February 9, 2004

Diego Adams February 9, 2004

Version 6.1 of the Radiological Safety Analysis Computer (RSAC) program was validated in October 2003. However, RSAC version 6.1 is a standalone Disk Operating System (DOS) based application that is not compatible with Windows XP machines. Therefore, RSAC version 6.2 was acquired from INEEL and the previous validation conducted for version 6.1 was repeated for version 6.2. The validation involved two test cases. The first test case was an installation test designed to verify that RSAC correctly installs on both Windows NT and XP machines. The second test case compares pathway and radionuclide dose generated by the RSAC software to spreadsheet calculated doses. A single attachment was included with

George Adams February 9, 2004 (continued)

the validation test report and this attachment contained the spreadsheet calculations and supporting files in electronic format.

Changes to PCSA Tool software, from 12/23/2003 to 3/26/2004:

D. STEAD

Changes common to all forms/reports:

1. Renamed some variables to conform with our coding standards.

2. Integrated new Crystal Reports (provided by George Adams):
External Events, External Events Detail, Results Table (both Current and Project Levels), RSAC Input, Safety Assessment Combinations, SSCs, SSC Design Bases & Criteria, SSCs Important to Safety, and System Description (Assumptions, Fire Hazards, Function, General, Human Actions, Operation Sequence, Shielding, Software Systems, Waste Characterization).
Updated Crystal Reports for Energy Method, Event Tree, FMEA, HRA, and What If.
Removed old Crystal Reports for Results Table and RSAC.
Removed all remaining VB reports and report subs in dlYMPModule1 associated with them.

3. mdlYMPModule1:
Added 'gsIncrementItemNo' subroutine to determine the next available Item Number for 'Form-view' forms.
Added code to set defaults for optional variables.
Removed unused subs (mostly for old VB reports).

4. Integrated various new and revised forms submitted by George Adams and Mark Silliman.

SCR432, System Description Module:

1. frmSystemDescription:
Removed default database references in data controls; added error handlers and comment blocks to many subroutines; renamed some variables and controls to comply with our coding standards;
removed unused subroutines (mostly callbacks for deleted command buttons).

2. Main MDI Form (mdifrmMain):
Added menu items and subroutines for new 'Image' form created by Mark Silliman.

3/29/04

3. mdlYMPModule1:
Added 'gsReturnedMemoValue' as part of integration of Mark Silliman's new '**frmInputMemoData**'.

SCR433, Hazard Analysis Module:
1. frmFMEAForm, frmHRAForm, frmWhatIfForm, frmEnergyAnalysisForm:
Added field length checking, allow 'txtItemNo' to accept only numeric entries, and use 'gsIncrementItemNo' to determine the next Item Number.

SCR434, Frequency Analysis Module:
1. frmEditTables:
Added field length checking.

2. frmInitEventForm, frmEventTree, frmEventSequenceForm, frmFaultTree:
Added field length checking, changed 'DOE' to 'Manual Data', allow 'txtItemNo' to accept only numeric entries, and use 'gsIncrementItemNo' to determine the next Item Number.

3. frmInitEventTable:, frmEventSequenceTable:
Changed 'DOE' to 'Manual Data', renamed associated variables accordingly, widened form for 1024x768 displays, and adjusted grid column widths accordingly.

5. frmEventTree:
Clear 'SaphireDataPath' if Initiating Event 'Manual Data' box is checked.

6. frmRiskAssessment:
Changed 'DOE' to 'Manual Data'.

7. mdlYMPModule1:
Added 'gbTextBoxLengthIsTooLong' to facilitate checking the length of strings about to be stored in the database from bound Text and Combo boxes.

SCR435, Consequence Analysis Module:
1. frmRSACInput:
Added error handlers in several places, added a drop-down combo box and text box and associated code to allow user to select the source of Group Release Fractions used in deterministic RSAC analysis. The previous deterministic Release Fraction data was designated as 'User Specified' on the list, and data from three new sources was added to the database, and can be selected from the drop-down list as 'NUREG/CR-6672', 'SFPO Interim Staff Guidance 5', and 'ANSI / ANS-5.10-1998'.
As requested by Roland Benke, only the 'User Specified' data may be edited by the user, but this can be changed in the future by changing 'AllowGroupFractionEdit' from 'N' to 'Y' in the 'RSAC_GrpRelFracSources' table in the database.
Two new command buttons were added on the Release Fraction tab, to load defaults for Release Fraction and HEPA Mitigation separately; the original default button loads the defaults for both.
Subroutines & functions added: 'RefreshRelFracSourceFromDB', 'cboRelFracSource_Click', 'cboRelFracSource_DropDown', 'cboRelFracSource_KeyPress', 'SaveRelFracSource', 'RelFracSourceInfo_Visible', 'SetDefsHEPAMitigation', 'cmdSetDefsHEPA_Click', 'cmdSetDefsRelFrac_Click',

3/29/04

'EditRSACInputValue_inGrid', 'bSaveNewRSACValue', bGridEditIsValid',
'bTextEditIsValid', and 'bRSACInputIsValid' (based on 'gRSACinputIsValid'
which was removed from 'mdlYMPModule1').
Extensive modifications were made to 'RefreshGroupData',
'SetDefsGroup', and 'grdGroupFraction_DblClick' to support
this addition. Other '_DblClick' subs were also modified to use
the new 'EditRSACInputValue_inGrid' sub, except 'grdRadionuclide_DblClick',
which can only be edited if the 'User Specified' Fuel Type is selected.
'RefreshNuclideData' was modified to execute much faster by scanning the
database for Group Fraction data and saving it to a structure indexed by
Group Number, which is then addressed directly to populate the 'RSAC
Radionuclide Inventory' table. This was previously done by looping through
the Release Fraction grid repeatedly to find the matching Group Number, which
caused the computer to 'freeze' for a few seconds during the operation.
This form was combined with 'frmRSAC_Output', to form 'frmRSAC_Main', a
combined RSAC input/output form.

2. frmRSAC_Output:
Added code to restore the 'Release Fraction Source' when loading a saved RSAC
run from a database file, including a new subroutine called
'sGetSavedRSACParameter'. Updated table names to be deleted in
'SaveRSACRunDBFile' to correspond to current database structure.
This form was combined (after changing several conflicting object and
variable names) with 'frmRSACInput', to form 'frmRSAC_Main', a combined RSAC
input/output form.

3. frmRSAC_Main:
This is a new form that combines (and replaces) both 'frmRSACInput' and
'frmRSAC_Output'.

4. frmEditRSACInput:
Enlarged 'lblParamDescription, added 'FormLoad()' and subroutine headers.

5. frmEditRSACLHS:
Added error handlers, changed code to work with the new 'frmRSAC_Main', added
field length checking.

6. frmLaunchRSAC:
Added RSAC start code that was previously in mdifrmMain.mnuRSAC_Click (the
menu item no longer exists, since RSAC is now started from frmRSAC_Main).

7. frmReadRSAC:
Removed unused sub 'ReadRSACLHSOutputFile', changed code to work with the new
'frmRSAC_Main' form, enable 'cmdSave' on 'frmRSAC_Main' after a successful
RSAC run is completed.

8. frmRSACCCDF:
Changed code to work with the new 'frmRSAC_Main'. 3/29/04

9. frmRSACDir:
Changed code to work with the new 'frmRSAC_Main'.

10. frmCrystalRSACOutput:
Changed code to work with the new 'frmRSAC_Main'.
Changed 'TOTAL' to 'TEDE'.

11. mdifrmMain:
Made changes in menu and associated subs to remove old RSAC Input/Output/Run menu items, and add new RSAC Main item.
Moved the code that launches RSAC fromfrmLaunchRSAC.

SCR436, Safety Analysis Module:
1. frmResultsTable:
Added 'TEDE' for Worker Dose, added Frequency Weighted Dose, ordering results by percent contribution. Added code to highlight grid cells with doses exceeding the limit. Changed 'DOE' to 'Manual Data' and renamed the function that detects this to 'bEventSeqHasManualData', the function to save the path to 'bSaveManualDataPathToDB', and the subroutine to write the dose files to 'WriteManualDataDoseFiles'.
Allow editing of 'Dose, PtEst' or 'TEDE' only for Event Sequences with 'Manual Data' checked in the Initiating Event. Added code to clear only the appropriate dose types in the Event Sequence table based on the Dose or Consequence Path type being edited.
Reset 'gsSearchString' to empty when 'cmdRefresh' is clicked and when form is loaded. Removed Frequency Weighted Dose for Worker Dose mode.

2. frmSafetyAssessment:
Added code to get 'dTotalFWD' from 'frmResultsTable', added error handlers, deleted unused code.

3. frmSafetyAssessmentSSCITS:
Added code to get 'dTotalFWD' from 'frmResultsTable', added error handlers.

4. frmSelectDirectory:
Added code to prohibit the selection of a 'ManData' directory.

5. mdlYMPModule1:
Added 'gChangeGridCellColor' subroutine to change the color of the given cell (row, column) in the grid 'ggrdGridInUse'.
This is currently used to highlight cells with Doses over a limit in 'frmResultsTable'. Added Dose limit constants.
Modified 'gbClearDosesForThisID' to allow clearing of Deterministic, Probabilistic (or both) dose types; clearing for individual dose types is used in frmResultsTable.

3/29/04

SCR437, Risk Assessment Module:
1. frmRiskAssessment:
Added code to assure a numeric entry for the cutoff value (txtCutOff).

SCR438, SSC Important to Safety Module:
1. frmEditTables:
Modified to handle SSC data, w/drop-down list box for SSC selection.

2. frmEventSequenceForm:
Added code to fix problems with SSC data, including code to clear the SSC list box and adding Worker Dose mode.
Added code to enable/disable the Good/Fail buttons for SSCs.

3. frmSSC_Data:
Added code to set the default tab to be shown upon loading of form.

David C. Stead 3/29/2004

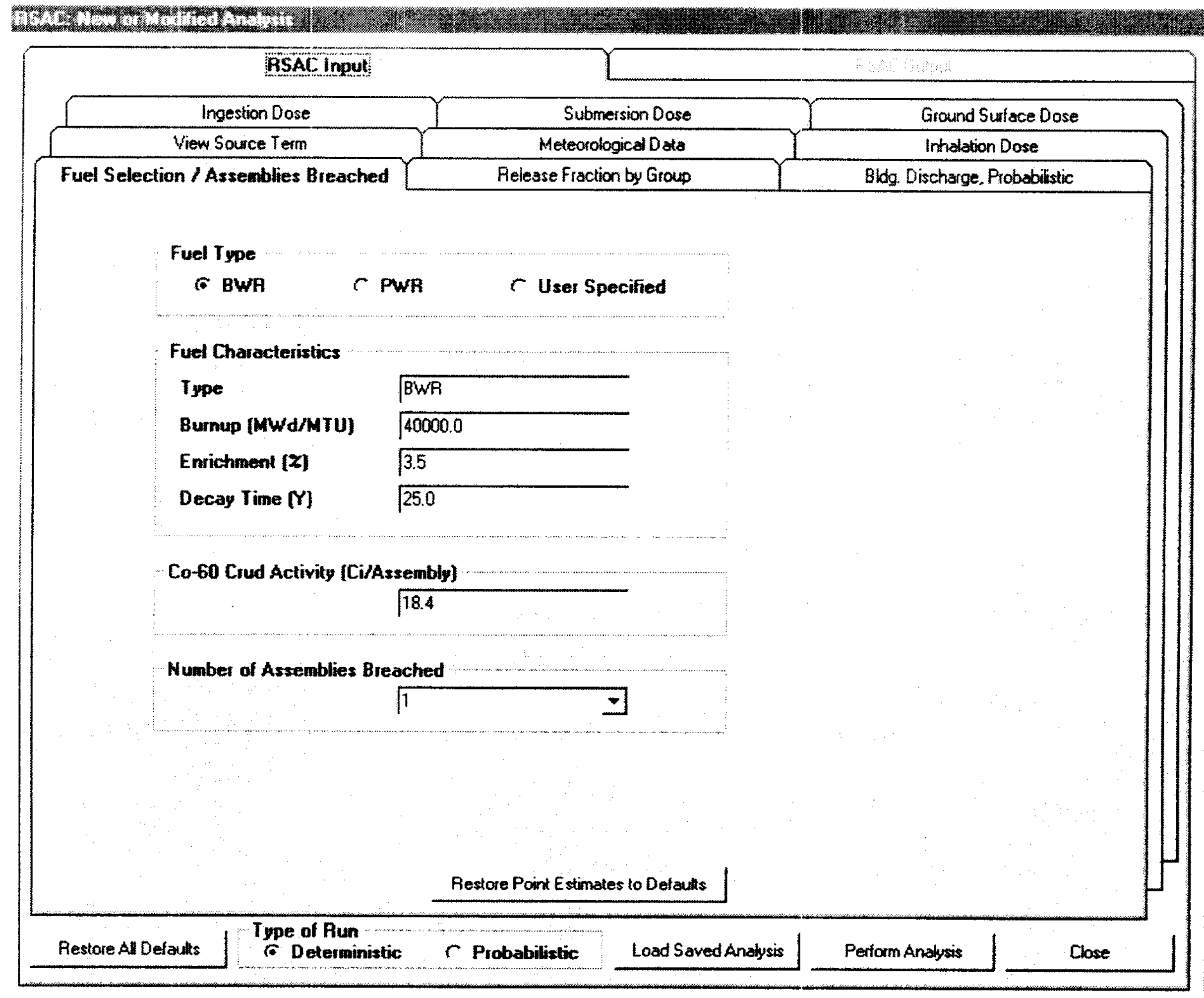
Mark Silliman January 20, 2004 - March 30, 2004

From October 2003 to January 2004 I worked primarily on the Merge Conversion Utility and therefore did not work on the PCSA tool.

1. Made modifications to the SDM (System Description Module) (Updated frmSystemDescription.frm). Added general tab. Limited inputs of text fields. Modified resetting value tools.
2. Added image viewing capabilities to the PCSA tool. (Created frmImage.frm). Modified shielding tab of System Description Module to include image viewing capabilities.
3. Edited frmRiskResults to include contribution calculations. (Updated frmRiskResults.frm)
4. Simplified hazard selection process. (Added frmInitEvFrmHazIdSel.frm). Modified hazard forms to include this process.

Mark Silliman 3/30/2004

D. STEAD, 3/31/04: The following 2 pages show screen prints of the new 'RSAC MAIN' form, with two views each of the input and output tabs.
David C. Stead 3/31/04



RSAC: New or Modified Analysis

RSAC Input | RSAC Output

Ingestion Dose | Submersion Dose | Ground Surface Dose
View Source Term | Meteorological Data | Inhalation Dose
Fuel Selection / Assemblies Breached | Release Fraction by Group | Bldg. Discharge, Probabilistic

Fuel Type
(•) BWR ( ) PWR ( ) User Specified

Fuel Characteristics

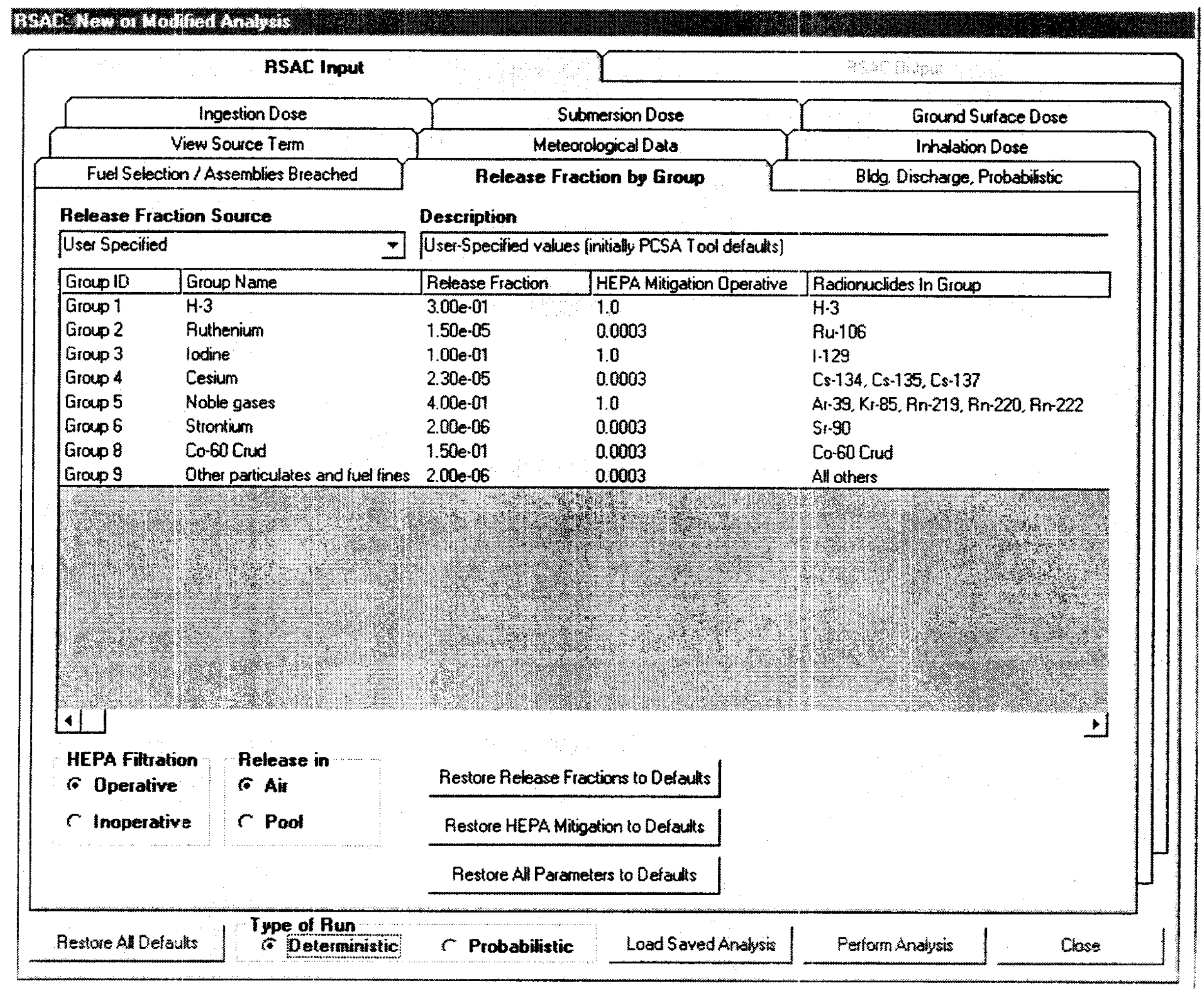
Type	BWR
Burnup (MWd/MTU)	40000.0
Enrichment (%)	3.5
Decay Time (Y)	25.0

Co-60 Crud Activity (Ci/Assembly)
18.4

Number of Assemblies Breached
1

Restore Point Estimates to Defaults

Restore All Defaults | **Type of Run** (•) Deterministic ( ) Probabilistic | Load Saved Analysis | Perform Analysis | Close



RSAC: New or Modified Analysis

RSAC Input | RSAC Output

Ingestion Dose | Submersion Dose | Ground Surface Dose
View Source Term | Meteorological Data | Inhalation Dose
Fuel Selection / Assemblies Breached | **Release Fraction by Group** | Bldg. Discharge, Probabilistic

Release Fraction Source: User Specified
Description: User-Specified values (initially PCSA Tool defaults)

Group ID	Group Name	Release Fraction	HEPA Mitigation Operative	Radionuclides In Group
Group 1	H-3	3.00e-01	1.0	H-3
Group 2	Ruthenium	1.50e-05	0.0003	Ru-106
Group 3	Iodine	1.00e-01	1.0	I-129
Group 4	Cesium	2.30e-05	0.0003	Cs-134, Cs-135, Cs-137
Group 5	Noble gases	4.00e-01	1.0	Ar-39, Kr-85, Rn-219, Rn-220, Rn-222
Group 6	Strontium	2.00e-06	0.0003	Sr-90
Group 8	Co-60 Crud	1.50e-01	0.0003	Co-60 Crud
Group 9	Other particulates and fuel fines	2.00e-06	0.0003	All others

HEPA Filtration (•) Operative ( ) Inoperative
Release in (•) Air ( ) Pool

Restore Release Fractions to Defaults
Restore HEPA Mitigation to Defaults
Restore All Parameters to Defaults

Restore All Defaults | **Type of Run** (•) Deterministic ( ) Probabilistic | Load Saved Analysis | Perform Analysis | Close

From RSAC Main, Input Tab, 2 screens R. [illegible] 3/31/07

RSAC: Most Recent Analysis

RSAC Input | **RSAC Output**

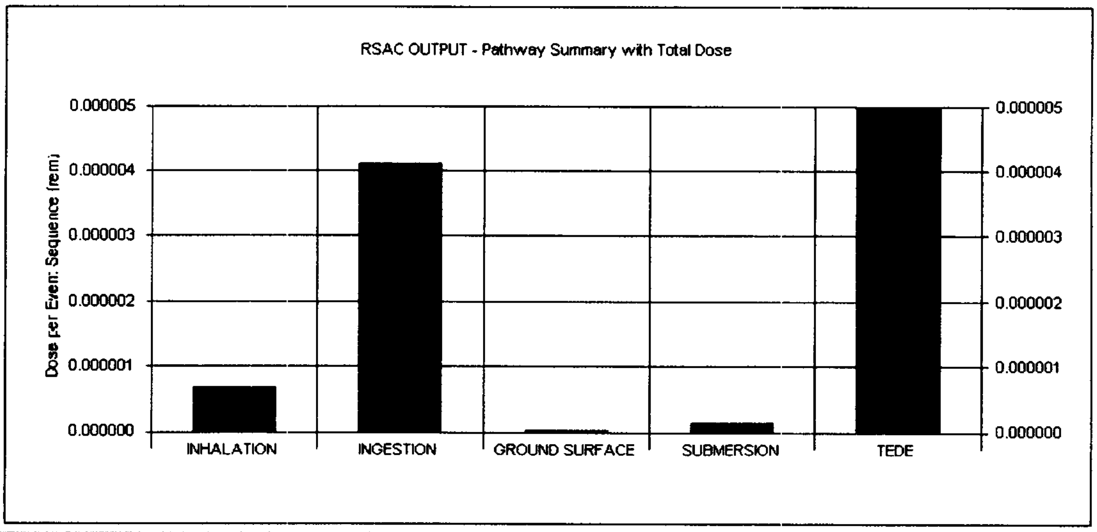
Summary Results | Inhalation | Ingestion | Ground Surface | Totals

For LHS results, double click in the table for the pathway of interest.

Pathway	Mean Dose per Event Sequence (rem)	Minimum	5th	50th	95th	Maximum	Number
INHALATION	6.98E-07	7.69E-08	7.69E-08	2.59E-07	2.04E-06	2.04E-06	0
INGESTION	4.11E-06	3.90E-07	3.90E-07	1.07E-06	1.86E-05	1.86E-05	0
GROUND SURFACE	3.75E-08	8.74E-10	8.74E-10	5.78E-09	1.86E-07	1.86E-07	0
SUBMERSION	1.55E-07	1.14E-08	1.14E-08	1.50E-07	4.67E-07	4.67E-07	0
TEDE	5.00E-06	5.26E-07	5.26E-07	1.42E-06	1.99E-05	1.99E-05	0

Plot by Pathway
- (•) **Dose by Pathway with Total**
- ( ) **Dose by Pathway**

Plot by Radionuclide
- ( ) **Inhalation**
- ( ) **Ingestion**
- ( ) **Ground Surface**
- ( ) **Combined**



Save Results | Load Saved Analysis | View RSAC Statistics File | Show Report | Close

RSAC: Most Recent Analysis

RSAC Input | **RSAC Output**

Summary Results | Inhalation | Ingestion | Ground Surface | **Totals**

Organ Summary

For LHS results, double click in the table for the organ of interest.

Component	Mean Dose per Event Sequence (rem)	Minimum	5th Percent	50th Percei	95th Percei	Maximum	Number
LUNGS	3.25E-06	3.56E-07	3.56E-07	1.40E-06	9.36E-06	9.36E-06	1
STOMACH	3.24E-06	3.55E-07	3.55E-07	1.37E-06	9.33E-06	9.33E-06	2
SMALL IN	3.24E-06	3.55E-07	3.55E-07	1.37E-06	9.33E-06	9.33E-06	3
UPPER LI	3.24E-06	3.55E-07	3.55E-07	1.38E-06	9.33E-06	9.33E-06	4
LOWER LI	3.24E-06	3.55E-07	3.55E-07	1.38E-06	9.33E-06	9.33E-06	5
GONADS	3.25E-06	3.56E-07	3.56E-07	1.38E-06	9.33E-06	9.33E-06	6
BREAST	3.25E-06	3.56E-07	3.56E-07	1.37E-06	9.33E-06	9.33E-06	7
BONE SUR	3.51E-06	3.82E-07	3.82E-07	1.82E-06	9.57E-06	9.57E-06	8
RED MARR	3.26E-06	3.57E-07	3.57E-07	1.41E-06	9.35E-06	9.35E-06	9
THYROID	6.11E-05	1.50E-06	1.50E-06	6.13E-06	5.25E-04	5.25E-04	10
KIDNEYS	3.24E-06	3.55E-07	3.55E-07	1.38E-06	9.33E-06	9.33E-06	11
LIVER	3.28E-06	3.59E-07	3.59E-07	1.45E-06	9.37E-06	9.37E-06	12
SPLEEN	3.24E-06	3.55E-07	3.55E-07	1.37E-06	9.33E-06	9.33E-06	13
PANCREAS	3.23E-06	3.55E-07	3.55E-07	1.37E-06	9.33E-06	9.33E-06	14
MUSCLE	3.24E-06	3.55E-07	3.55E-07	1.37E-06	9.33E-06	9.33E-06	15
SKIN	3.26E-06	3.57E-07	3.57E-07	1.38E-06	9.34E-06	9.34E-06	16

Top Radionuclide Contributors to Total Dose

Component	Mean Dose per Event Sequence (rem)	Minimum	5th Percent	50th Percei	95th Percei	Maximum	Number
H3	3.04E-06	3.43E-07	3.43E-07	1.13E-06	9.14E-06	9.14E-06	10030
I129	1.75E-06	3.87E-09	3.87E-09	1.74E-07	1.57E-05	1.57E-05	531290
Co60	3.59E-08	1.61E-10	1.61E-10	4.37E-09	2.16E-07	2.16E-07	270600
Pu238	5.92E-09	3.01E-10	3.01E-10	3.50E-09	1.98E-08	1.98E-08	942380
Am241	4.50E-09	2.41E-10	2.41E-10	2.71E-09	1.46E-08	1.46E-08	952410
Pb212	1.50E-09	7.39E-11	7.39E-11	1.07E-09	4.83E-09	4.83E-09	822120
Pu241	1.13E-09	5.73E-11	5.73E-11	6.67E-10	3.77E-09	3.77E-09	942410
Pu240	7.18E-10	3.65E-11	3.65E-11	4.25E-10	2.40E-09	2.40E-09	942400
Ba137m	4.82E-10	5.13E-12	5.13E-12	9.14E-11	2.06E-09	2.06E-09	561371
Sr90	4.59E-10	1.11E-11	1.11E-11	1.77E-10	1.97E-09	1.97E-09	380900

Save Results | Load Saved Analysis | View RSAC Statistics File | Show Report | Close

Frm RSAC_Main, Output Tab, 2 views, [illegible initials] 3/31/04

[illegible signature] 3/31/04

Allison Adams February 10, 2004 - April 5, 2004

SCR	Submission	Description
438	02-09-2004	Added SSC Functions to the SSC Data form. Files updated: frmEditTables.frm, frx frmSSC_Data.frm, frx Database: Added tables: SSC_Function, SSC_Function_List, SSC_Function_Temp
438	02-12-2004	Added SSC Hazards, Initiating Events, and Event Sequences to the SSC_Data form Files updated: frmEditTables.frm, frx frmSSC_Data.frm, frx Files created: frmEditList.frm, frx
438	02-16-2004	Corrected database references on secondary grid components Files updated: frmSSC_Data.frm, frx
435	02-18-2004	Modified some RSAC default parameters. Also changed the display of Combined Total Dose to TEDE The following parameters were altered: Meteorological Data / Downwind Distance: changed the minimum value from 0 to 100 Number of Realizations: set the default to 100 Ingestion / Vegetable Exposure Time: set the default to 35 Ingestion / Forage Exposure Time: set the default to 3.5 Release Fraction by Group for Fuel Fines (Air) (mode): set the mode for the LHS parameter to 1×10^{-5} Files updated: frmRSAC_Output.frm, frx frmRSACCCDF.frm, frx pcsa-prob.f, exe

Dwayne Adams February 10, 2004 - April 5, 2004 (Continued)

SCR	Submission	Description
434, 436, 438	02-19-2004	Added linkage from initiating event form to the SSC Design Bases and Design Criteria. Added aggregate dose to SafetyAssessmentCombinations. Modified the SSC_Data form to include event tree subsequent events instead of event sequences. Files updated: frmInitEventForm.frm,frx frmSafetyAssessmentCombinations.frm,frx frmSafetyAssessmentWorker.frm frmSSC_Data.frm,frx
435	02-20-2004	Performed a database update of default RSAC parameters: Database changes: (1) Corrected an error in which the deterministic value for release fraction by group for fuel fines was set to 1e-5 instead of the middle LHS parameter value. (2) Set the Release Fraction by Group LHS for noble gases maximum value to 1.0
433	02-23-2004	Added linkage of SSC Design Bases and Design Criteria to the internal hazards form Files updated: CrystalEnergymethod.dca,dsr,dsx,rpt CrystalFMEA.dca,dsr,dsx,rpt CrystalHRA.dca,dsr,dsx,rpt CrystalWhatIf.dca,dsr,dsx,rpt frmEnergyAnalSelTable.frm,frx frmEnergyAnalTable.frm,frx frmEnergyAnalysisForm.frm frmFMEAForm.frm frmHRA_SELTable.frm,frx

Diane Adams February 10, 2004 - April 5, 2004 (continued)

SCR	Submission	Description
433 (continued)	02-23-2004 (continued)	Files updated: frmHRAForm.frm, frx (continued) frmHRATable.frm, frx frmMDIFMEATable.frm, frx frmMDIWHATIFTable.frm, frx frmSelTable.frm, frx frmWhatIfform.frm frmWhatIfSelTable.frm, frx Database update: In table PSA1_FMEA-Table changed the DOE Safeguards field to Mitigative Features. This same change was made to the HumanReliabilityAnalysis and WhatIf tables. In table EnergyAnalysis, the mitigative Features field was added.
438	02-24-2004	Adjusted the appearance of controls on the External Event Analysis form. Files updated: frmExtEventAnalysis.frm
437	02-25-2004	Corrected errors in Risk Assessment calculations which occured from the addition of worker dose. Files updated: frmEventTree.frm, frx frmRiskAssessment.frm, frx frmRiskEventSequence.frm, frx frmRiskResults.frm, frx MDI_PCSA_Frm1.frm, frx Files created: frmMonitorRisk.frm

Diane Adams April 5, 2004

Doug Adams February 10, 2004 - April 5, 2004 (continued)

SCR	Submission	Description
438	02-26-2004	Modified ResultsTable SSCITS to allow fields to be edited with the functional ID supplied to frmEditTables Files updated: frmEditTables.frx frmResultsSSCITSTable.frm,frx frmResultsTable.frm,frx frmSafetyAssessmentSSCITS.frm
438	03-01-2004	Added SSC Takeaway Analysis Files updated: frmNormalOperationDose.frx frmResultsSSCITSTable.frm,frx frmSafetyAssessmentSSCITS.frm frm SSC_ViewAll.frm,frx MDI_PCSA_Frml.frm,frx Database update: Removed field SSC from Table EventSequenceSSCIS
436	03-05-2004	Corrected an error in which the dose would not be retrieved from pcsastat.out. Also, allow editing of Additional Info field. Files updated: frmResultsTable.frm,frx mdlYMPModule1.bas
435, 436	03-08-2004	Modified the code to use pcsastat.txt instead of pcsastat.out Files updated: frmReadRSAC.frm frmResultsTable.frm,frx frmRiskAssessment.frm,frx frmRiskEventSequence.frm,frx frmRSAC_Output.frm,frx mdlYMPModule1.bas rsac6.bat in directory tools

Doug Adams February 10, 2004 - April 5, 2004 (Continued)

SCR	Submission	Description
435, 436 (continued)	03-05-2004 (Continued)	Files updated: pcsastat.txt in the following directories: 1) projects\pcsadeq\rsacruns\det\NONE 2) projects\pcsadeq\rsacruns\prb\NONE 3) template\fileidet 4) template\filesprb
438	03-09-2004	Added Crystal Reports to SSC_Data form. Files Created: Crystal SSC.dca, dsr, dsx, rpt Crystal SSC DB and DC.dca, dsr, dsx, rpt frm Crystal SSC.frm frm Crystal SSC DB and DC.frm frm SSC_Data.frm, frx
435	03-16-2004	Replaced the RSAC Input Crystal Report with a new one to reflect the Database changes. Files updated: frmRSAC_Main.frm, frx Files created: Crystal RSAC Input.dca, dsr, dsx, rpt frm Crystal RSAC Input.frm Database update: Added field AMN to RSAC Radionuclide Inventory. This allows radionuclides to be sorted by Atomic Mass Number Files Removed: frmRSACInputReport.frm
438	03-17-2004	Removed SSCs from the Event Sequence form. Removed the design bases and design criteria button from the frmSSC_ViewAll form. Files updated: frmEditTables.frm, frx frmEventSequenceForm.frm

Doug Adams February 10, 2004 - April 5, 2004 (continued)

SCR	Submission	Description
438 (continued)	03-17-2004 (continued)	Files updated: frmEventSequenceTable.frm, frx frmEventTree.frm, frx frmRSAC_Main.frm, frx frmSSC_ViewAll.frm, frx mdlYMPModule1.bas Database update: removed table EventSequenceSSC
436	03-18-2004	Modified event sequence field from DOE to Manual Data in Crystal Reports. Added normal, maximum, and aggregate dose to SafetyAssessmentCombinations form Files modified: CrystalResultsTableCurrent.dca, dsr, dsx, rpt CrystalResultsTableProject.dca, dsr, dsx, rpt CrystalSafetyAssessmentCombinations.dca, dsr, dsx, rpt frmCrystalResultsTableProject.frm frmCrystalSafetyAssessmentCombinations.frm frmResultsTable.frm, frx frmSafetyAssessment.frm frmSafetyAssessmentCombinations.frm, frx
435	03-23-2004	Modified RSAC_Main to eliminate a race condition when retrieving stored data. The tables with the problem were: RSAC_CCDF_Data, RSAC_Output, and RSAC_DateTime Files updated: frmRSAC_Main.frm, frx

Doug Adams April 5, 2004

George Adams April 5, 2004

Made PCSA Tool Version 3.0.0 BetaA available for Acceptance Testing on March 29, 2004. Acceptance Testing will be documented in Scientific Notebook 635E.

Made PCSA Tool Version 3.0.0 BetaB available for Acceptance Testing on April 1, 2004. The following documents the upgrade from 3.0.0 BetaA to 3.0.0 BetaB.

readme.txt

Upgrade instructions for Upgrading the PCSA Tool from Version 3.0 BetaA to Version 3.0 BetaB

++++++++++++++++++
Summary of Changes
++++++++++++++++++
Discussion of changes from BetaA to BetaB:
SCR434: Modified the Initiating Event Form Edit Hazard ID functionality. The Select Hazard ID form was not being populated correctly. In addition, controls on the Initiating Event form were moved to make the Hazard ID and editing functionality more clear.

SCR436: For category 1 compliance assessment, the grid would extend below the summary calculations. Modified the grid to remain above the summary for category 1 compliance assessment.

SCR437: Added contribution (%) to the probabilistic (tabular) and deterministic results. This new field is the percent contribution to the total risk. Also added this field to the Crystal Report.

++++++++++++++++++++
To Upgrade to BetaB:
++++++++++++++++++++
<<Warning: Don't replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

1) [Create a new PCSA Tool Directory] Go to the installation directory for the PCSA Tool: The default installation location is c:\program files\PCSATool directory. Copy this PCSATool directory to a new location. For example, you could copy it to d:\AT\PCSATool.

2) [Upgrade the executable] Within the new directory, replace the PCSATool.exe file with the new one that I have at: s:\gadams\PCSATool Acceptance Testing\Versions\BetaB. Create a desktop shortcut to this new executable if you want.

3) [Upgrade the database] Place the new PCSADemo.mdb file under d:\AT\PCSATool\Projects replacing the existing file. Place the new Template.mdb file under d:\AT\PCSATool\Template replacing the existing file.

4) [Upgrade FORTRAN code] Place the new pcsa_totrisk.exe file under d:\AT\PCSATool\RISK replacing the existing file.

George Adam April 5, 2004

George Adams April 5, 2004

George Adams April 16, 2004

Made PCSATool Version 3.0.0 BetaC available for acceptance testing on April 7, 2004. The following documents the upgrade from BetaB to BetaC.

readme.txt

Upgrade instructions for Upgrading the PCSA Tool from Version 3.0 BetaB to Version 3.0 BetaC

++++++++++++++++++
Summary of Changes
++++++++++++++++++
Discussion of changes from BetaB to BetaC:

SCR432: Modified the grids on the System Description form to allow the user to edit them in a similar manner to the grids contained in the rest of the tool. Resized controls on the grid.

SCR433: Modified the Internal Events/Energy Method form to eliminate the Error 91 which appeared when the user tried to update a record.

SCR435: Modified the Normal Operation Dose form to set the focus on the textbox after the user chooses to edit the normal operation dose; otherwise, the edit command button has the focus. Modified the RSAC input/output form to eliminate the type mismatch error which occurred when the user would select the deterministic analysis.

SCR508: Updated the SSC View All form to correct an error in which the current selection grid would not update correctly when the user chose to filter the SSCs. Also modified the current selection grid to allow the user to resize the row height.

++++++++++++++++++++
To Upgrade to BetaC:
++++++++++++++++++++
<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

This procedure assumes that PCSATool Version 3.0 BetaA was the originally installed version and afterwards it was upgraded to PCSATool Version 3.0 BetaB. The directory path [dir_Beta] refers to the parent directory for the folder labeled PCSATool. (Contained within the PCSATool folder is the PCSATool executable.)

1) [Upgrade the executable] Within [dir_Beta]\PCSATool, replace the PCSATool.exe file with the new one that I have at: s:\gadams\PCSATool Acceptance Testing\Versions\BetaC.

3) [Upgrade the database] Place the new PCSADemo.mdb file under [dir_Beta]\PCSATool\Projects replacing the existing file. Place the new Template.mdb file under [dir_Beta]\PCSATool\Template replacing the existing file.

George Adams April 16, 2004

George Adams April 16, 2004

George Adams April 16, 2004

Made PCSA Tool Version 3.0.0BetaD available for acceptance testing on April 15, 2004.

The following documents the upgrade from BetaC to BetaD. George Adams April 16, 2004

readme.txt

Upgrade instructions for Upgrading the PCSA Tool from Version 3.0 BetaC to Version 3.0 BetaD

++++++++++++++++++
Summary of Changes
++++++++++++++++++
Discussion of changes from BetaC to BetaD:

SCR435: Modified the PCSA Tool to correct errors observed from acceptance testing. The following errors were corrected:
1) RSAC Input: On going from probabilistic to deterministic, an error 13 type mismatch was observed. Corrected this error.
2) RSAC Input: On going from probabilistic to deterministic, parameter values which have both deterministic and probabilistic sample values were being changed to their default values instead of those values contained in the project file. Corrected to retain values in the project file rather than restoring certain deterministic values to their defaults.
3) RSAC Input: On Restoring All Defaults, on the Release Fraction by Group tab, the Air/Pool radio buttons would not be restored with Air selected by default. Corrected the screen to restore Air as the default.
4) RSAC Run: When the fuel type was 'User Specified' and default PWR values were specified, upon performing an analysis, the RSAC run would timeout. (The standalone rsac executable would not return the required output.) The PCSA Tool now reads a status file and determines whether or not the RSAC run was successful. If it was not successful, then the user is informed of the error condition. In some cases, the user is prompted to perform an advanced RSAC run.
5) RSAC Run: When the fuel type was 'User Specified' and Co60 crud was supplied with a value and a probabilistic run was conducted, the RSAC run would timeout. (The standalone FORTRAN code would encounter an error reading groupdef.dat and stop.) The error observed was No RSAC input file created. This was an error in not specifing 0 values for radionuclide contributions in file groupdef.dat for radionuclides listed on the View Source Term screen. The Co60 crud is combined with the Co60 contribution by the standalone code for probabilistic runs.
6) Manual Data: When a database was copied using the 'Save As' feature, the project directory associated with the .mdb file was not copied. This resulted in not allowing the user to update manual data. Corrected the 'Save As' feature to also copy the project directory.
7) RSAC Output: The Show Report button would appear on tabs for which the report was not applicable. Removed the Show Report button from tabs where it was not applicable.

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To Upgrade to BetaD:
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<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

This procedure assumes that PCSATool Version 3.0 BetaA was the originally installed version and afterwards it was upgraded to PCSATool Version 3.0 BetaB and then to PCSATool Version 3.0 BetaC. The directory path [dir_Beta] refers to the parent directory for the folder labeled PCSATool. (Contained within the PCSATool folder is the PCSATool executable.)

1) [Upgrade the executable] Within [dir_Beta]\PCSATool, replace the pcsatool.exe file with the new one that I have at: s:\gadams\PCSATool Acceptance Testing\Versions\BetaC.

2) [Upgrade the database] Place the new pcsademo.mdb file under [dir_Beta]\PCSATool\Projects replacing the existing file. Place the new template.mdb file under [dir_Beta]\PCSATool\Template replacing the existing file.

3) [Upgrade FORTRAN code] Place the new pcsa_prob.exe file under

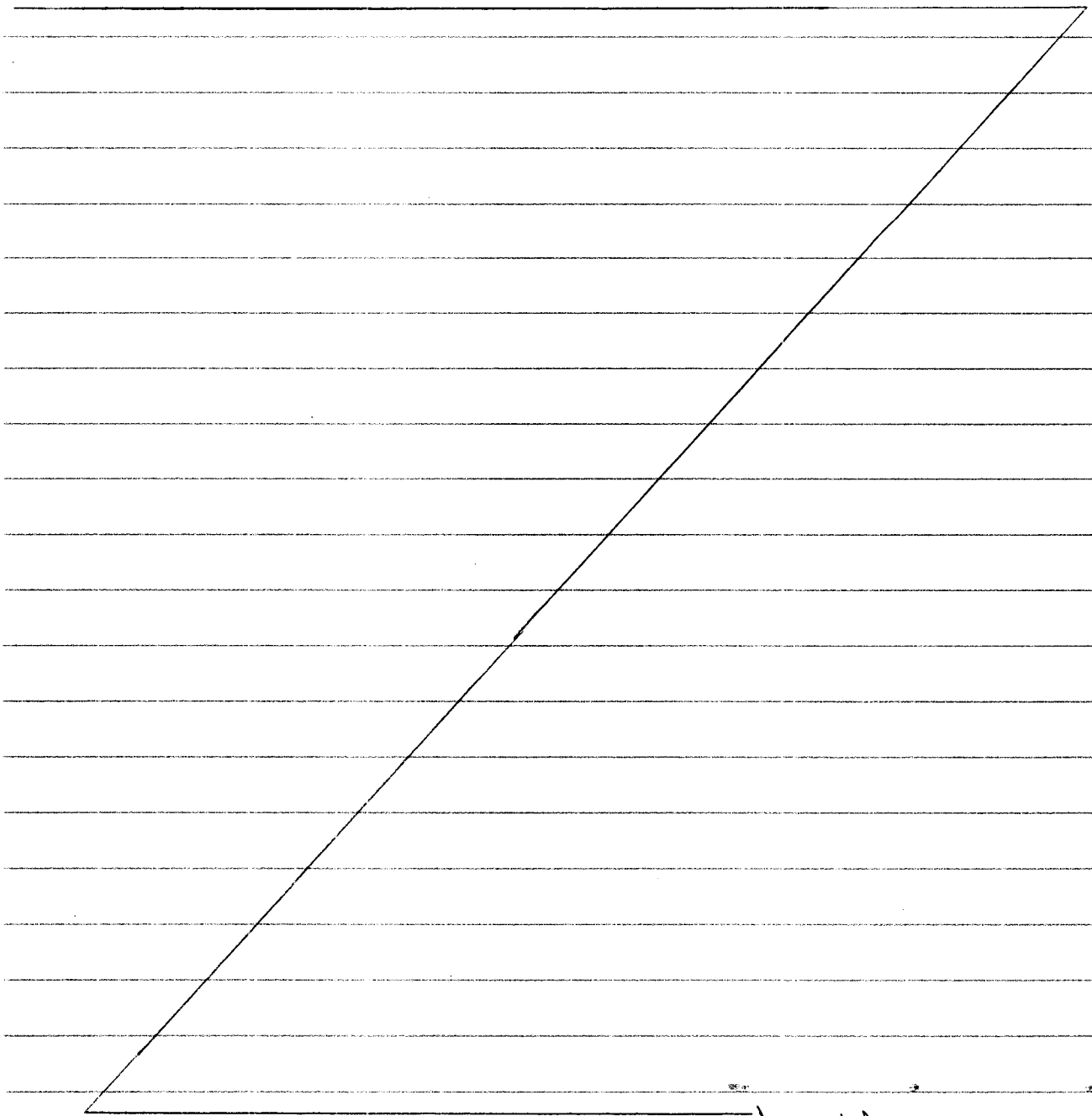
George Adams April 16, 2004

PCSA Tool Version 3.0.0 Beta C to Beta D upgrade (continued).

George Adams April 16, 2004

readme.txt

[dir_Beta]\PCSATool\Tools replacing the existing file.



George Adams April 21, 2004

Doug Adams April 21, 2004

Made PCSATool Version 3.0.0 BetaE available for acceptance testing on April 21, 2004.

The following documents the changes for version BetaE.

readme.txt Doug Adams April 21, 2004

Upgrade instructions for Upgrading the PCSA Tool to Version 3.0.0 BetaE

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Summary of Changes
++++++++++++++++++
Discussion of changes from BetaD to BetaE:

SCR431: Modified the PCSA Tool to address errors and comments observed from acceptance testing.
The following errors and comments were addressed:
1) Project tree: Modified the project tree to not expand the tree to the last valid selection when it is collapsed and the collapse button is pressed.
2) Project tree: Corrected the project tree to not expand a previous limb of the tree containing the last valid selection when a different limb of the tree is selected repeatedly.
3) Report: Corrected spelling and capitalization errors in the data.

SCR434: Modified the PCSA Tool to address errors from acceptance testing.
The following erorrs were addressed:
1) The Fault Tree Event Table Crystal Report displayed the Top Event Name and Description, but the heading only indicated Top Event Name. Corrected the heading to display both.

SCR436: Modified the PCSA Tool to address errors from acceptance testing.
The following errors were addressed:
1) Corrected the label for Total Frequency Weighted Dose for the probabilistic case. Formerly, the first part was missing characters.
2) Modified the combinations table to display the Expected Number as Expected Number of Occurrences per year.

SCR506: Modified the PCSA Tool to save and restore RSAC runs from the database instead of using the last generated RSAC files.

SCR508: Modified Crystal Reports to use gSetLevelDescriptions subroutine instead of the hard-coded functionality.

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To Upgrade to BetaE:
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<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

PCSA Tool Version 3.0.0 BetaE will be deployed by copying the run-time version to the tester's machine instead of upgrading from a previous version.

PCSA Tool Version 3.0.0 BetaE will be placed on a shared directory on Machine PITOR. The testers have read access to the following directory on Machine PITOR: DevShare.

To upgrade to PCSA Tool Version 3.0.0 BetaE, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaE, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

George Adams May 7, 2004

Made PCSATool Version 3.0.0 BetaF available for acceptance testing on April 28, 2004. The following documents the changes for version BetaF.

George Adams May 7, 2004

readme.txt

Upgrade instructions for Upgrading the PCSA Tool to Version 3.0.0 BetaF

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Summary of Changes
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Discussion of changes from BetaE to BetaF:

SCR432: Modified the PCSA Tool to address errors and comments observed from acceptance testing the System Description form.
The following errors and comments were addressed:
1) When multiple records exist and a record is edited, the screen jumps to the last record. Corrected the forms to remain at the record recently edited.
2) When only one record exists and this record is deleted, the text remains on the screen. Corrected the form to remove the text from the screen.
3) Updated the images form to also update the System Description form (Shielding tab) when images are added or deleted.

SCR509: Included compliance assessment in worker dose calculations. Also, included an internal worker dose non-pool calculation.

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To Upgrade to BetaF:
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<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

PCSA Tool Version 3.0.0 BetaF will be deployed by copying the run-time version to the tester's machine instead of upgrading from a previous version.

PCSA Tool Version 3.0.0 BetaF will be placed on a shared directory on Machine PITOR. The testers have read access to the following directory on Machine PITOR: DevShare.

To upgrade to PCSA Tool Version 3.0.0 BetaF, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaF, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

George Adams May 7, 2004

Doug Adams May 7, 2004

Made PCSA Tool Version 3.0.0 BetaG available for acceptance testing on May 7, 2004. The following documents the changes for version BetaG.

Doug Adams May 7, 2004

readme.txt

Upgrade instructions for Upgrading the PCSA Tool to Version 3.0.0 BetaG

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Summary of Changes
++++++++++++++++++
Discussion of changes from BetaF to BetaG:

SCR432: Modified the PCSA Tool to address errors and comments observed from acceptance testing the System Description form.
The following errors and comments were addressed:
1) After adding an item on the System Description form Waste Characterization tab, the record cannot be edited or deleted because the buttons are not enabled. Corrected the tab to enable the buttons.

SCR437: Modified the PCSA Tool to address errors and comments observed from acceptance testing the Risk Analysis Module.
The following errors and comments were addressed:
1) Modified the report to indicate that the results are deterministic or probabilistic.
2) When displaying a probabilistic plot, the user is prompted to determine if he or she wants to see the plot with the data. The prompt was modified to ask the user if he or she wants to see the data with the plot.

SCR508: Made minor corrections to Crystal Report headings to align text and ensure that text in longer headings was not being cut off.

SCR509: Included an internal worker dose non-pool (Dry) calculation.

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To Upgrade to BetaG:
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<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

PCSA Tool Version 3.0.0 BetaG will be deployed by copying the run-time version to the tester's machine instead of upgrading from a previous version.

PCSA Tool Version 3.0.0 BetaG will be placed on a shared directory on Machine PITOR. The testers have read access to the following directory on Machine PITOR: DevShare.

To upgrade to PCSA Tool Version 3.0.0 BetaG, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaG, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams May 7, 2004

Doug Adams May 11, 2004

Troy Maxwell started working on PCSA Tool development from May 4, 2004. He will make entries into this scientific notebook.

Troy Maxwell May 6, 2004 - May 12, 2004

SCR	Submission	Description
508	5-6-2004	Added Probabilistic and Deterministic labels for Risk Assessment Files Modified: Crystal Risk Results Graph.rpt Crystal Risk Results Table.rpt frm Crystal Risk Results Graph.frm frm Crystal Risk Results Table.frm Modified headings and heading spacing Files Modified: Crystal Event Sequence.rpt Crystal External Events.rpt Crystal Fire Hazards.rpt Crystal Operation Sequence.rpt Crystal Software System.rpt Crystal Waste Characterization.rpt Crystal What If.rpt
508	5-12-2004	Added "Affect on Other Functional Areas" to What If crystal report. Files Modified: Crystal What If.rpt Adjusted column width for far right column of Risk Assessment Files Modified: frm Risk Assessment.frm Modified headings and heading spacing Files Modified: Crystal Function.rpt

Tracy Maxwell May 6, 2004 - May 12, 2004 (continued)

SCR	Submission	Description
508 (cont.)	5-12-2004 (cont.)	Files Modified: Crystal Operation Sequence.rpt Crystal Shielding.rpt

Tracy Maxwell May 13, 2004

Doug Adams May 14, 2004

Made PCSA Tool Version 3.0.0 BetaH available for testing on May 14, 2004. The following documents the changes for version BetaH. Version BetaH is the initial version of the PCSA Tool made available for Validation testing.

Doug Adams 5-14-2004

readme.txt

Upgrade instructions for Upgrading the PCSA Tool to Version 3.0.0 BetaH

++++++++++++++++++
Summary of Changes
++++++++++++++++++
Discussion of changes from BetaG to BetaH:

SCR508: Made minor corrections to Crystal Report headings to align text and ensure that text in longer headings was not being cut off.

SCR509: Upgraded the internal worker dose non-pool (Dry) calculation to correct errors in the calculations.

++++++++++++++++++++
To Upgrade to BetaH:
++++++++++++++++++++
<<Warning: Do not replace or modify files in the installation directory. The default installation directory is c:\program files\PCSATool.>>

PCSA Tool Version 3.0.0 BetaH will be deployed by copying the run-time version to the tester's machine instead of upgrading from a previous version.

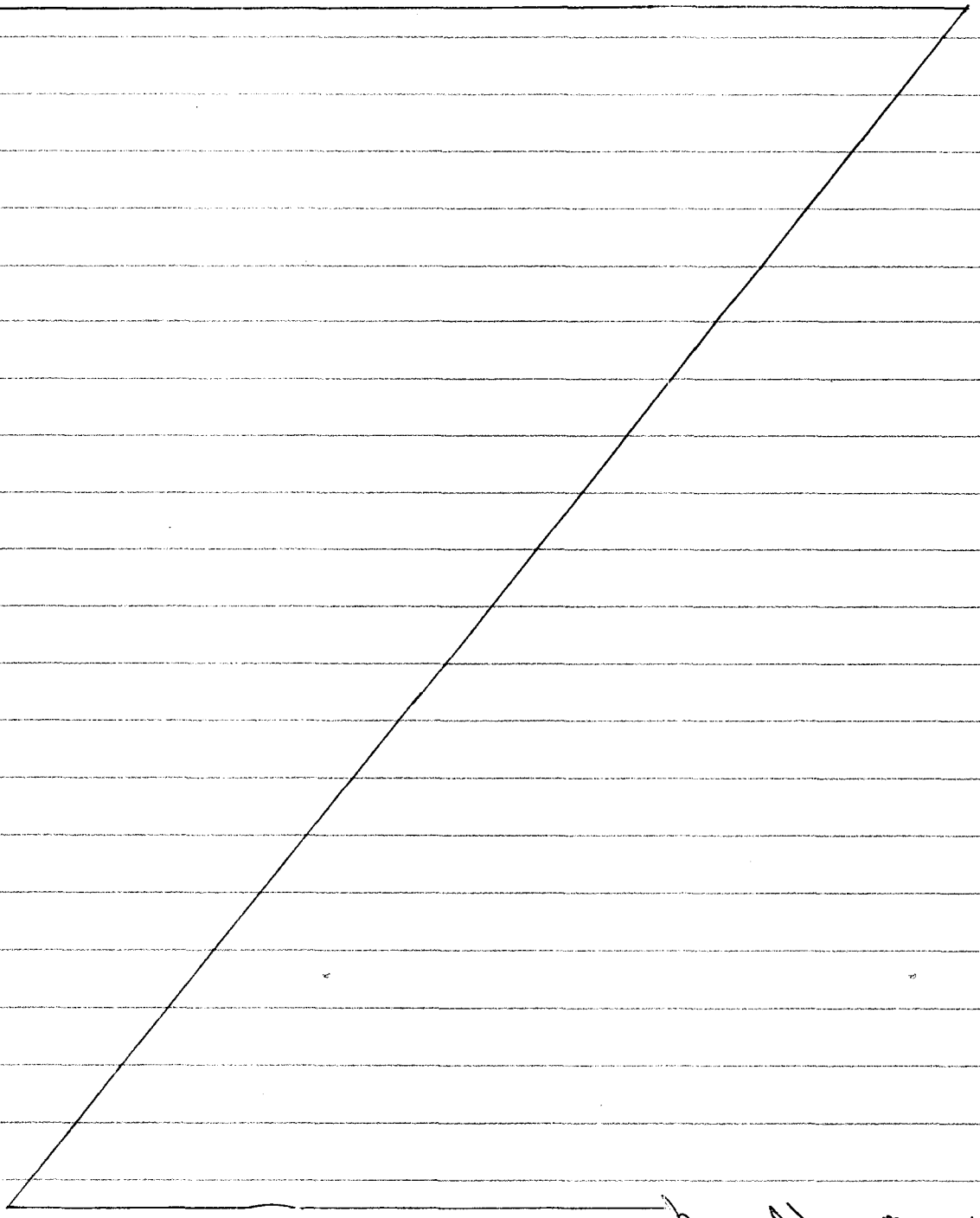
PCSA Tool Version 3.0.0 BetaH will be placed on a shared directory on Machine PITOR. The testers have read access to the following directory on Machine PITOR: DevShare.

To upgrade to PCSA Tool Version 3.0.0 BetaH, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaH, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams May 14, 2004

George Adams May 14, 2004

The calculations shown on page 47 were performed to verify the worker dose values generated by Version BetaH of the RCSA Tool. Calculations were performed for Kr-85 and Y-90. For Y-90 different time steps are presented. In all cases, version BetaH and hand calculations differed by less than 0.01 %.



George Adams, May 14, 2004

Calculation for Kr85

Geometric Factor	1.963428E+01	1.963428E+01
Occupancy Factor	1.000000E+00	
Hot Cell Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03
Worker Room Volume (ft^3)/(m^3)	1.800010E+05	5.097061E+03
Inventory (Ci)	4.240000E+02	
Release Fraction	1.000000E+00	
Released Activity (Ci)	4.240000E+02	
Concentration in the Hot Cell at time = 0, Co (Ci/m^3)	8.318566E-02	
half life (yr)/(s)	1.072000E+01	3.380659E+08
decay constant (1/s)	2.050331E-09	
time (h)/(s)	8.000000E+00	2.880000E+04
leakage rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02
ventilation rate (%/day)/(m^3/s)	2.400000E+03	1.415850E+00
lambda0	2.316865E-06	
lambda1	2.777798E-04	
f(t)	2.426140E+04	
coefficient	8.403315E-03	
Concentration in the worker room at time = t	1.695958E+01	
Dose		
Submersion		
DCF Submersion (Sv/Bq)/(rem/Ci)	1.190000E-16	4.403000E-04
Dose at time = t	3.803195E-04	
Value from PCSA Tool (BetaH)	3.803200E-04	
Percent Difference	-0.0001%	

Verification against hand calculations	Time (h)	PCSA Tool			Hand Calculations			Percent Difference		
Y-90		Submersion	Inhalation	TOTAL	Submersion	Inhalation	TOTAL	Submersion	Inhalation	Total
	1.001	1.82240E-08	1.50280E-03	1.50280E-03	1.82240E-08	1.50280E-03	1.50280E-03	0.0000%	0.0000%	0.0000%
	2.201	6.41090E-08	5.28670E-03	5.28680E-03	6.41100E-08	5.28670E-03	5.28670E-03	-0.0016%	0.0000%	0.0019%
	3.101	1.03980E-07	8.57440E-03	8.57450E-03	1.03980E-07	8.57440E-03	8.57440E-03	0.0000%	0.0000%	0.0012%
	4.001	1.45030E-07	1.19600E-02	1.19600E-02	1.45030E-07	1.19600E-02	1.19600E-02	0.0000%	0.0000%	0.0000%
	5.201	1.99760E-07	1.64730E-02	1.64730E-02	1.99760E-07	1.64730E-02	1.64730E-02	0.0000%	0.0000%	0.0000%
	6.101	2.40290E-07	1.98150E-02	1.98150E-02	2.40290E-07	1.98150E-02	1.98150E-02	0.0000%	0.0000%	0.0000%
	7.001	2.80210E-07	2.31070E-02	2.31070E-02	2.80210E-07	2.31070E-02	2.31070E-02	0.0000%	0.0000%	0.0000%
	8.000	3.23770E-07	2.66990E-02	2.66990E-02	3.23770E-07	2.66990E-02	2.66990E-02	0.0000%	0.0000%	0.0000%

SCR431:

1. frmProjectTreeView:
   Removed sub 'trvTreeView_DblClick()' and moved call to 'ExpandSelection' to remedy the unexpected tree expansion behavior seen in acceptance testing.

2. frmTreeView:
   Changed the GUI trvTreeView.Style property to 6, to match setting the in frmProjectTreeView.

SCR432:

1. frmEditTables:
   Modified to work with frmSystemDescription: sFieldCaption was changed to Public, added sSysDescrType. Moved code for sFieldName and captioning to Form_Activate from Form_Load.

2. frmSystemDescription:
   Several modifications were made to make this form's behavior consistent with that of other forms within the PCSA Tool:
   Adjusted column widths, modified grid editing for 'Assumptions', 'Maintenance', and 'Operational'. Added 'Item No' to 'Assumptions'.
   Grid editing is now done with frmEditTables, via 'EditRecord_InGrid()'.
   Removed 'sInputBox2' and 'sInputBox3.
   Changed to defined table name constants for database table reference.
   Human Actions tab grid height increased.
   Added code to detect valid cell clicked in 'grdImages_DblClick().
   Added 'bItemNo_isOK()' to verify Item Numbers are valid and format them. It is called from new 'txtItemNoxxx_LostFocus()' callbacks that are invoked when the user clicks out of an Item Number text box.
   Use 'gsIncrementItemNo()' to suggest the next item number.
   Use 'gDeleteRecordFromTable()' to delete records.
   Save position in recordset before editing a record, and restore the recordset position after editing, to avoid user having to scroll through records to find a record after editing it.
   Reordered code in 'cmdAdd_xxx' subs for uniform behavior among all.
   Added 'OtherTabs_ReportCloseButtons_Enabled()' to keep user from clicking on other tabs, showing a report, or closing the form while adding or editing a record; it is called from 'TextBoxesLocked()'.
   Enable or disable Edit and Delete buttons in 'datXXX_Reposition()' callbacks **(disabled if no records exist).**

SCR506:

1. frmRSAC_Main:
   Added 'Set_giRunType_and_giNumRealizations' to set global variables, 'bLoadFromFile' to indicate a run has just completed, returned to using 'CopySavedRSACTable' in 'LoadRSACrun' to load data from database to avoid 'out-of-sync' condition. Added highlighting of uneditable cells, and rejection of attempts to edit 'FIXED' parameters.
   Set Valid I/O Pair->False on error, added check for existence of saved RSAC database file and better handling of errors when loading a saved RSAC run. Added descriptive error messages.

Faustic 5/27/2004

2. frmReadRSAC:
   Added 'bLoadFromFile' in 'cmdDone_Click()'.

3. frmResultsTable, frmResultsSSCITSTable:
   Added grid references to calls to 'gChangeGridCellColor()'.

4. mdlYMPModule1:
   Added grid reference 'grdRef' to 'gChangeGridCellColor'
   (passed as a parameter).

SCR507:

1. mdlYMPModule1:
   Modified 'gHighlightGridCellOrRow' to accept iCol >= 0.

2. frmEditRSACInput, frmEditRSACLHS:
   Minor GUI property changes, including setting Word Wrap property to True on labels to allow long field names to wrap to a second line.

SCR509:

1. Developed 'frmWorkerDry', and added 5 database tables to support it.
   The tables are based on similar RSAC tables, and are named:
   'WkrDry_CrudInventory', 'WkrDry_FuelInformation', 'WkrDry_GeneralInput',
   'WkrDry_GroupReleaseFractions', and 'WkrDry_RadionuclideInv'.
   This form uses 'frmEditRSACInput' to edit parameters displayed in grids.
   The equations used to calculate the doses were provided by Razvan Nes.
   The Dose Conversion Factors (DCFs) were obtained from EPA Federal guidance reports 11 and 12 (EPA 402-R-93-081 and EPA-520/1-88-020).
   The DCFs obtained were given in Sv/Bq, and were entered into the database table as-is (to prevent confusion, as requested by Biswajit Dasgupta); they are converted to rem/Ci and saved to separate database fields when the form is loaded. The user can see both values in the grid on the 'Source Term' tab, but the original Sv/Bq units are shown in 'grayed' cells. Likewise, the decay constants are computed from the Half Lives, and saved in a separate database field; the Half Lives are also 'grayed'.
   The Half Life data (with all values given in seconds) was obtained from Los Alamos National Laboratory's internet site at:
   http://t2.lanl.gov/data/decayd.html (address current as of 5/27/04).

2. mdlYMPModule1:
   Added 'gChangeGridColumnColor()' to highlight an entire column in a grid. It is used to 'gray' the columns of original values in frmWorkerDry.

3. Testing of Worker Dry dose calculations:
   An EXCEL spreadsheet was used to record results of testing to verify the doses calculated on the Worker Dry form. The equations provided by Razvan Nes were entered into the spreadsheet, and results were compared to results from PCSA Tool, version 3.0, Beta I. Results were also compared to calculations done on Mathematica by Razvan Nes. In all cases, the values obtained were the same as those from the spreadsheet-entered formula and Razvan Nes' calculations, to the seventh decimal place.

David C. Hall, 5/27/04

The following are the results printed from the EXCEL spreadsheet used for Worker Dry dose verification.

Scenario #1.
Kr85, Sr90, Y90, Am241

Calculation for Kr85, Sr90, Y90, Am241 (leakage rate = 20%, ventilation rate = 2400%)	Kr85	Converted Vals	Sr90		Y90		Am241	
Geometric Factor	1.963432E+01	1.963432E+01						
Occupancy Factor	1.000000E+00							
Breathing Rate (m^3/s)	3.500000E-04							
Hot Cell Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03						
Worker Room Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03						
Inventory (Ci)	4.240000E+02		2.370000E-01		2.370000E-01		1.670000E-02	
Release Fraction	1.000000E+00		1.000000E+00		1.000000E+00		1.000000E+00	
Released Activity (Ci)	4.240000E+02		2.370000E-01		2.370000E-01		1.670000E-02	
Concentration in Hot Cell at time = 0, Co (Ci/m^3)	8.318566E-02		4.649764E-05		4.649764E-05		3.276416E-06	
half life (s)	3.382900E+08		8.883300E+08		2.307600E+05		1.365500E+10	
decay constant (1/s)	2.048973E-09		7.802812E-10		3.003758E-06		5.076142E-11	
time (h)/(s)	8.000000E+00	2.880000E+04						
leakage rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02						
ventilation rate (%/day)/(m^3/s)	2.400000E+03	1.415842E+00						
lambda0	2.316864E-06		2.315595E-06		5.318573E-06		2.314866E-06	
lambda1	2.777798E-04		2.777786E-04		2.807815E-04		2.777778E-04	
f(t)	2.426140E+04		2.426189E+04		2.314233E+04		2.426217E+04	
coefficient	8.403361E-03							
Concentration in Worker Room at time = t	1.695967E+01		9.480006E-03		9.042552E-03		6.680082E-04	
Dose								
Submersion		Converted Vals		Converted Vals		Converted Vals		Converted Vals
DCF Submersion (Sv/Bq)/(rem/Ci)	1.190000E-16	4.403000E-04	7.530000E-18	2.786100E-05	1.900000E-16	7.030000E-04	8.180000E-16	3.026600E-03
Dose at time = t	3.803209E-04		1.345208E-08		3.237654E-07		1.029724E-07	
Value from PCSA Tool (Beta I)	3.803209E-04		1.345208E-08		3.237654E-07		1.029724E-07	
Percent Difference	0.0000%		0.0000%		0.0000%		0.0000%	
Dose								
Inhalation								
DCF Inhalation (Sv/Bq)/(rem/Ci)	0.000000E+00	0.000000E+00	3.510000E-07	1.298700E+06	2.280000E-09	8.436000E+03	1.200000E-04	4.440000E+08
Dose at time = t	0.000000E+00		4.309090E+00		2.669904E-02		1.038085E+02	
Value from PCSA Tool (Beta I)	0.000000E+00		4.309090E+00		2.669904E-02		1.038085E+02	
Percent Difference	0.0000%		0.0000%		0.0000%		0.0000%	

Verification against Mathematica calculations
(using sums of individual calculations below)

Time (h)	PCSA Tool Submersion	PCSA Tool Inhalation	PCSA Tool TOTAL	Mathematica Calculations Submersion	Mathematica Calculations Inhalation	Mathematica Calculations TOTAL	Percent Difference Submersion	Percent Difference Inhalation	Percent Difference Total
1.001	2.058586E-05	5.846522E+00	5.846543E+00	2.058586E-05	5.846522E+00	5.846543E+00	0.0000%	0.0000%	0.0000%
2.201	7.297688E-05	2.072612E+01	2.072620E+01	7.297688E-05	2.072612E+01	2.072620E+01	0.0000%	0.0000%	0.0000%
3.101	1.190034E-04	3.379833E+01	3.379845E+01	1.190034E-04	3.379833E+01	3.379845E+01	0.0000%	0.0000%	0.0000%
4.001	1.668600E-04	4.739046E+01	4.739063E+01	1.668600E-04	4.739046E+01	4.739063E+01	0.0000%	0.0000%	0.0000%
5.201	2.313838E-04	6.571664E+01	6.571687E+01	2.313838E-04	6.571664E+01	6.571687E+01	0.0000%	0.0000%	0.0000%
6.101	2.797064E-04	7.944153E+01	7.944181E+01	2.797064E-04	7.944153E+01	7.944181E+01	0.0000%	0.0000%	0.0000%
7.001	3.277755E-04	9.309458E+01	9.309491E+01	3.277755E-04	9.309458E+01	9.309491E+01	0.0000%	0.0000%	0.0000%
8.000	3.807611E-04	1.081443E+02	1.081446E+02	3.807611E-04	1.081443E+02	1.081446E+02	0.0000%	0.0000%	0.0000%

Calculations for individual radionuclides
(run by Razvan Nes on Mathematica)

Time (h)	Kr85 Submersion	Kr85 Inhalation	Sr90 Submersion	Sr90 Inhalation	Y90 Submersion	Y90 Inhalation	Am241 Submersion	Am241 Inhalation
1.001	2.056134E-05	0.000000E+00	7.272493E-10	2.329589E-01	1.822355E-08	1.502790E-03	5.566862E-09	5.612061E+00
2.201	7.289045E-05	0.000000E+00	2.578124E-09	8.258477E-01	6.410906E-08	5.286699E-03	1.973476E-08	1.989499E+01
3.101	1.188631E-04	0.000000E+00	4.204178E-09	1.346719E+00	1.039772E-07	8.574393E-03	3.218175E-08	3.244304E+01
4.001	1.666639E-04	0.000000E+00	5.894905E-09	1.888308E+00	1.450311E-07	1.195987E-02	4.512382E-08	4.549019E+01
5.201	2.311133E-04	0.000000E+00	8.174501E-09	2.618529E+00	1.997600E-07	1.647304E-02	6.257359E-08	6.308164E+01
6.101	2.793806E-04	0.000000E+00	9.881742E-09	3.165407E+00	2.402852E-07	1.981491E-02	7.564215E-08	7.625631E+01
7.001	3.273951E-04	0.000000E+00	1.158005E-08	3.709424E+00	2.802080E-07	2.310711E-02	8.864235E-08	8.936205E+01
8.000	3.803209E-04	0.000000E+00	1.345208E-08	4.309090E+00	3.237654E-07	2.669904E-02	1.029724E-07	1.038085E+02

Part C 5/27/04

Scenario #2
Kr 85, Sr 90, Y90, Am 241

results, continued

Calculation for Kr85, Sr90, Y90, Am241 (leakage rate = 20%, ventilation rate = 0%)	Kr85	Converted Vals	Sr90		Y90		Am241	
Geometric Factor	1.963432E+01	1.963432E+01						
Occupancy Factor	1.000000E+00							
Breathing Rate (m^3/s)	3.500000E-04							
Hot Cell Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03						
Worker Room Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03						
Inventory (Ci)	4.240000E+02		2.370000E-01		2.370000E-01		1.670000E-02	
Release Fraction	1.000000E+00		1.000000E+00		1.000000E+00		1.000000E+00	
Released Activity (Ci)	4.240000E+02		2.370000E-01		2.370000E-01		1.670000E-02	
Concentration in Hot Cell at time = 0, Co (Ci/m^3)	8.318566E-02		4.649764E-05		4.649764E-05		3.276416E-06	
half life (s)	3.382900E+08		8.883300E+08		2.307600E+05		1.365500E+10	
decay constant (1/s)	2.048973E-09		7.802812E-10		3.003758E-06		5.076142E-11	
time (h)/(s)	8.000000E+00	2.880000E+04						
leakage rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02						
ventilation rate (%/day)/(m^3/s)	0.000000E+00	0.000000E+00						
lambda0	2.316864E-06		2.315595E-06		5.318573E-06		2.314866E-06	
lambda1	2.048973E-09		7.802812E-10		3.003758E-06		5.076142E-11	
f(t)	-9.389807E+02		-9.390035E+02		-8.867216E+02		-9.390166E+02	
coefficient	-1.000000E+00							
Concentration in Worker Room at time = t	7.810973E+01		4.366145E-02		4.123047E-02		3.076609E-03	

Dose								
Submersion		Converted Vals		Converted Vals		Converted Vals		Converted Vals
DCF Submersion (Sv/Bq)/(rem/Ci)	1.190000E-16	4.403000E-04	7.530000E-18	2.786100E-05	1.900000E-16	7.030000E-04	8.180000E-16	3.026600E-03
Dose at time = t	1.751612E-03		6.195537E-08		1.476242E-06		4.742545E-07	
Value from PCSA Tool (Beta I)	1.751612E-03		6.195537E-08		1.476242E-06		4.742545E-07	
Percent Difference	0.0000%		0.0000%		0.0000%		0.0000%	
Dose								
Inhalation								
DCF Inhalation (Sv/Bq)/(rem/Ci)	0.000000E+00	0.000000E+00	3.510000E-07	1.298700E+06	2.280000E-09	8.436000E+03	1.200000E-04	4.440000E+08
Dose at time = t	0.000000E+00		1.984609E+01		1.217371E-01		4.781051E+02	
Value from PCSA Tool (Beta I)	0.000000E+00		1.984610E+01		1.217371E-01		4.781051E+02	
Percent Difference	0.0000%		0.0000%		0.0000%		0.0000%	

Verification against Mathematica calculations
(using sums of individual calculations below)

Time (h)	PCSA Tool			Mathematica Calculations			Percent Difference		
	Submersion	Inhalation	TOTAL	Submersion	Inhalation	TOTAL	Submersion	Inhalation	Total
1.001	2.799299E-05	7.950197E+00	7.950225E+00	2.799299E-05	7.950198E+00	7.950226E+00	0.0000%	0.0000%	0.0000%
2.201	1.348872E-04	3.830931E+01	3.830945E+01	1.348872E-04	3.830931E+01	3.830945E+01	0.0000%	0.0000%	0.0000%
3.101	2.670842E-04	7.585519E+01	7.585545E+01	2.670842E-04	7.585519E+01	7.585546E+01	0.0000%	0.0000%	0.0000%
4.001	4.435035E-04	1.259615E+02	1.259619E+02	4.435035E-04	1.259615E+02	1.259619E+02	0.0000%	0.0000%	0.0000%
5.201	7.469464E-04	2.121460E+02	2.121467E+02	7.469464E-04	2.121460E+02	2.121467E+02	0.0000%	0.0000%	0.0000%
6.101	1.025265E-03	2.911958E+02	2.911969E+02	1.025265E-03	2.911958E+02	2.911969E+02	0.0000%	0.0000%	0.0000%
7.001	1.346710E-03	3.824958E+02	3.824971E+02	1.346710E-03	3.824958E+02	3.824971E+02	0.0000%	0.0000%	0.0000%
8.000	1.753625E-03	4.980729E+02	4.980747E+02	1.753624E-03	4.980729E+02	4.980747E+02	0.0000%	0.0000%	0.0000%

Calculations for individual radionuclides
(run by Razvan Nes on Mathematica)

Time (h)	Kr85	Kr85	Sr90	Sr90	Y90	Y90	Am241	Am241
	Submersion	Inhalation	Submersion	Inhalation	Submersion	Inhalation	Submersion	Inhalation
1.001	2.795965E-05	0.000000E+00	9.889256E-10	3.167814E-01	2.477374E-08	2.042946E-03	7.569912E-09	7.631374E+00
2.201	1.347276E-04	0.000000E+00	4.765299E-09	1.526463E+00	1.183509E-07	9.759709E-03	3.647693E-08	3.677309E+01
3.101	2.667697E-04	0.000000E+00	9.435634E-09	3.022506E+00	2.328346E-07	1.920051E-02	7.222706E-08	7.281348E+01
4.001	4.429837E-04	0.000000E+00	1.566836E-08	5.019028E+00	3.841484E-07	3.167847E-02	1.199370E-07	1.209108E+02
5.201	7.460766E-04	0.000000E+00	2.638887E-08	8.453116E+00	6.414574E-07	5.289724E-02	2.019999E-07	2.036400E+02
6.101	1.024077E-03	0.000000E+00	3.622189E-08	1.160292E+01	8.748360E-07	7.214261E-02	2.772696E-07	2.795208E+02
7.001	1.345157E-03	0.000000E+00	4.757871E-08	1.524083E+01	1.141775E-06	9.415553E-02	3.642037E-07	3.671608E+02
8.000	1.751612E-03	0.000000E+00	6.195537E-08	1.984609E+01	1.476242E-06	1.217371E-01	4.742545E-07	4.781051E+02

Paul Scott 3/12/04

Calculation for Kr85		
(leakage rate = 20%, ventilation rate = 2400%)		
Geometric Factor	1.963432E+01	1.963432E+01
Occupancy Factor	1.000000E+00	
Hot Cell Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03
Worker Room Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03
Inventory (Ci)	4.240000E+02	
Release Fraction	1.000000E+00	
Released Activity (Ci)	4.240000E+02	
Concentration in Hot Cell at time = 0, Co (Ci/m^3)	8.318566E-02	
half life (s)	3.382900E+08	
decay constant (1/s)	2.048973E-09	
time (h)/(s)	8.000000E+00	2.880000E+04
leakage rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02
ventilation rate (%/day)/(m^3/s)	2.400000E+03	1.415842E+00
lambda0	2.316864E-06	
lambda1	2.777798E-04	
f(t)	2.426140E+04	
coefficient	8.403361E-03	
Concentration in Worker Room at time = t	1.695967E+01	
Dose		
Submersion		
DCF Submersion (Sv/Bq)/(rem/Ci)	1.190000E-16	4.403000E-04
Dose at time = t	3.803209E-04	
Value from PCSA Tool (Beta I)	3.803209E-04	
Percent Difference	0.0000%	

Verification against hand calculations
Y90
(hand calculations by Razvan Nes)

Time (h)	PCSA Tool			Hand Calculations			Percent Difference		
	Submersion	Inhalation	TOTAL	Submersion	Inhalation	TOTAL	Submersion	Inhalation	Total
1.001	1.82240E-08	1.50280E-03	1.50280E-03	1.82240E-08	1.50280E-03	1.50280E-03	0.0000%	0.0000%	0.0000%
2.201	6.41090E-08	5.28670E-03	5.28680E-03	6.41100E-08	5.28670E-03	5.28670E-03	-0.0016%	0.0000%	0.0019%
3.101	1.03980E-07	8.57440E-03	8.57450E-03	1.03980E-07	8.57440E-03	8.57440E-03	0.0000%	0.0000%	0.0012%
4.001	1.45030E-07	1.19600E-02	1.19600E-02	1.45030E-07	1.19600E-02	1.19600E-02	0.0000%	0.0000%	0.0000%
5.201	1.99760E-07	1.64730E-02	1.64730E-02	1.99760E-07	1.64730E-02	1.64730E-02	0.0000%	0.0000%	0.0000%
6.101	2.40290E-07	1.98150E-02	1.98150E-02	2.40290E-07	1.98150E-02	1.98150E-02	0.0000%	0.0000%	0.0000%
7.001	2.80210E-07	2.31070E-02	2.31070E-02	2.80210E-07	2.31070E-02	2.31070E-02	0.0000%	0.0000%	0.0000%
8.000	3.23770E-07	2.66990E-02	2.66990E-02	3.23770E-07	2.66990E-02	2.66990E-02	0.0000%	0.0000%	0.0000%

results, continued

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Calculation for Am241
(leakage rate = ventilation rate = 20%)

	Am241	Converted Vals
Geometric Factor	1.963432E+01	1.963432E+01
Occupancy Factor	1.000000E+00	
Breathing Rate (m^3/s)	3.500000E-04	
Hot Cell Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03
Worker Room Volume (ft^3)/(m^3)	1.800000E+05	5.097032E+03
Inventory (Ci)	1.670000E-02	
Release Fraction	1.000000E+00	
Released Activity (Ci)	1.670000E-02	
Concentration in Hot Cell at time = 0, Co (Ci/m^3)	3.276416E-06	
half life (s)	1.365500E+10	
decay constant (1/s)	5.076142E-11	
time (h)/(s)	8.000000E+00	2.880000E+04
leakage rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02
ventilation rate (%/day)/(m^3/s)	2.000000E+01	1.179869E-02
lambda0	2.314866E-06	
lambda1	2.314866E-06	
f(t)	3.967403E+08	
coefficient	2.314815E-06	
Concentration in Worker Room at time = t	3.008997E-03	

Dose		
Submersion		Converted Vals
DCF Submersion (Sv/Bq)/(rem/Ci)	8.180000E-16	3.026600E-03
Dose at time = t	4.638321E-07	
Value from PCSA Tool (Beta I)	4.638321E-07	
Percent Difference	0.0000%	
Dose		
Inhalation		
DCF Inhalation (Sv/Bq)/(rem/Ci)	1.200000E-04	4.440000E+08
Dose at time = t	4.675981E+02	
Value from PCSA Tool (Beta I)	4.675981E+02	
Percent Difference	0.0000%	

Verification against Mathematica calculations
(using sums of individual calculations below)

Time (h)	PCSA Tool Submersion	PCSA Tool Inhalation	PCSA Tool TOTAL	Mathematica Calculations Submersion	Mathematica Calculations Inhalation	Mathematica Calculations TOTAL	Percent Difference Submersion	Percent Difference Inhalation	Percent Difference Total
1.001	7.548893E-09	7.610183E+00	7.610183E+00	7.548893E-09	7.610184E+00	7.610184E+00	0.0000%	0.0000%	0.0000%
2.201	3.625459E-08	3.654895E+01	3.654895E+01	3.625459E-08	3.654895E+01	3.654895E+01	0.0000%	0.0000%	0.0000%
3.101	7.160757E-08	7.218897E+01	7.218897E+01	7.160758E-08	7.218897E+01	7.218897E+01	0.0000%	0.0000%	0.0000%
4.001	1.186114E-07	1.195744E+02	1.195744E+02	1.186114E-07	1.195744E+02	1.195744E+02	0.0000%	0.0000%	0.0000%
5.201	1.991026E-07	2.007191E+02	2.007191E+02	1.991026E-07	2.007191E+02	2.007191E+02	0.0000%	0.0000%	0.0000%
6.101	2.726103E-07	2.748237E+02	2.748237E+02	2.726103E-07	2.748237E+02	2.748237E+02	0.0000%	0.0000%	0.0000%
7.001	3.571896E-07	3.600897E+02	3.600897E+02	3.571896E-07	3.600897E+02	3.600897E+02	0.0000%	0.0000%	0.0000%
8.000	4.638321E-07	4.675981E+02	4.675981E+02	4.638321E-07	4.675981E+02	4.675981E+02	0.0000%	0.0000%	0.0000%

results, continued

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WORKER DRY FORM, SCREEN PRINTS 5/27/04

PCSA Tool - frmWorkerDry

Internal Worker Dose | Source Term | Release Fraction by Group

Rooms

Leakage and Ventilation Rates

Units for Rates ( ) m^3/s (•) %/day

Leakage Rate from the Hot Cell to the Worker Room (m^3/s): 20.0

Ventilation Rate of the Worker Room (m^3/s): 2400.0

Volume of the Hot Cell (m^3): 5097.03238656

Volume of Worker Room (m^3): 5097.03238656

Breathing Rate (m^3/s): 3.50E-04

Exposure Duration (h): 8.0

Occupation Factor: 1.0

Fuel

(•) BWR ( ) PWR ( ) User Specified

Type: BWR

Burnup (MWd/MTU): 40000.0

Enrichment (%): 3.5

Decay Time (Y): 25.0

Co-60 Crud Activity (Ci/Assembly): 18.4

Number of Assemblies Breached: 1

Dose

Radionuclide	TEDE submersion (rem)	TEDE inhalation (rem)
H 3	1.0603663E-07	3.8085373E-02
C 14	5.6057991E-10	9.6995724E-03
CL 36	3.9334363E-10	7.1879653E-04
AR 39	9.8776763E-13	0.0000000E+00
FE 55	0.0000000E+00	2.0380556E-02
NI 59	0.0000000E+00	1.4237726E-02
CO 60	5.1189643E-02	1.6499965E+02
CO 60 Crud	1.7474759E-02	5.6326412E+01
NI 63	0.0000000E+00	4.3502056E+00
SE 79	2.1720740E-10	1.3103809E-02
KR 85	3.4354461E-04	0.0000000E+00
SR 90	4.8813451E-04	1.5636359E+05
Y 90	1.1762110E-02	9.6995238E+02
MO 93	3.2292441E-11	6.7630952E-05
NB 93M	1.3621329E-08	1.6655112E-01
ZR 93	0.0000000E+00	2.5779020E+00
NB 94	1.3872032E-05	1.3866005E-01
TC 99	3.6023716E-08	3.4382697E-01
RH106	5.4943628E-12	5.0874316E-44
RU106	0.0000000E+00	2.2578418E-02
PD107	0.0000000E+00	5.4685973E-03
SN121M	1.2388190E-07	4.3980049E-02
SB125	1.0809507E-03	1.2135354E+00
TE125M	5.8944827E-06	1.7615609E-01
Totals	2.7591465E-01	1.2651522E+07

Restore Point Estimates to Defaults | Calculate Doses

Number of Decimal Places to Display: 7 **TEDE**: 1.2651522E+07

Restore All Defaults | View Notes | Show Report | Close

PCSA Tool - frmWorkerDry

Internal Worker Dose | **Source Term** | Release Fraction by Group

Radionuclide	Inventory (Ci/Assembly)	Release Fraction	Assemblies	Released Activity (Ci)	Half Life (s)	Decay Constant (1/s)	DCF submersion (Sv/Bq)	DCF submersion (rem/Ci)	DCF inhalation (Sv/Bq)	DCF inhalation (rem/Ci)
H 3	4.25E+01	1.00E+00	1	4.25E+01	3.8910E+08	1.7814E-09	3.31E-19	1.2247E-06	1.73E-11	6.4010E+01
C 14	3.32E-01	1.00E+00	1	3.32E-01	1.8082E+11	3.8334E-12	2.24E-19	8.2880E-07	5.64E-10	2.0868E+03
CL 36	2.34E-03	1.00E+00	1	2.34E-03	9.4986E+12	7.2974E-14	2.23E-17	8.2510E-05	5.93E-09	2.1941E+04
AR 39	1.44E-05	1.00E+00	1	1.44E-05	8.4888E+09	8.1654E-11	9.10E-18	3.3670E-05	0.00E+00	0.0000E+00
FE 55	5.42E-01	1.00E+00	1	5.42E-01	8.6150E+07	8.0458E-09	0.00E+00	0.0000E+00	7.26E-10	2.6862E+03
NI 59	3.76E-01	1.00E+00	1	3.76E-01	2.3668E+12	2.9286E-13	0.00E+00	0.0000E+00	7.31E-10	2.7047E+03
CO 60	5.39E+01	1.00E+00	1	5.39E+01	1.6635E+08	4.1668E-09	1.26E-13	4.6620E-01	5.91E-08	2.1867E+05
CO 60 Crud	1.84E+01	1.00E+00	1	1.84E+01	1.6635E+08	4.1668E-09	1.26E-13	4.6620E-01	5.91E-08	2.1867E+05
NI 63	4.94E+01	1.00E+00	1	4.94E+01	3.1588E+09	2.1943E-10	0.00E+00	0.0000E+00	1.70E-09	6.2900E+03
SE 79	9.51E-02	1.00E+00	1	9.51E-02	1.0414E+12	6.6559E-13	3.03E-19	1.1211E-06	2.66E-09	9.8420E+03
KR 85	3.83E+02	1.00E+00	1	3.83E+02	3.3829E+08	2.0490E-09	1.19E-16	4.4030E-04	0.00E+00	0.0000E+00
SR 90	8.60E+03	1.00E+00	1	8.60E+03	8.8833E+08	7.8028E-10	7.53E-18	2.7861E-05	3.51E-07	1.2987E+06
Y 90	8.61E+03	1.00E+00	1	8.61E+03	2.3076E+05	3.0038E-06	1.90E-16	7.0300E-04	2.28E-09	8.4360E+03
MO 93	1.70E-04	1.00E+00	1	1.70E-04	1.1045E+11	6.2757E-12	2.52E-17	9.3240E-05	7.68E-09	2.8416E+04
NB 93M	4.07E-01	1.00E+00	1	4.07E-01	5.0901E+08	1.3618E-09	4.44E-18	1.6428E-05	7.90E-09	2.9230E+04
ZR 93	5.74E-01	1.00E+00	1	5.74E-01	4.8282E+13	1.4356E-14	0.00E+00	0.0000E+00	8.67E-08	3.2079E+05
NB 94	2.39E-02	1.00E+00	1	2.39E-02	6.4061E+11	1.0820E-12	7.70E-14	2.8490E-01	1.12E-07	4.1440E+05
TC 99	2.95E+00	1.00E+00	1	2.95E+00	6.6617E+12	1.0405E-13	1.62E-18	5.9940E-06	2.25E-09	8.3250E+03
RH106	3.38E-03	1.00E+00	1	3.38E-03	2.9800E+01	2.3260E-02	1.04E-14	3.8480E-02	1.40E-44	5.1848E-32
RU106	3.38E-03	1.00E+00	1	3.38E-03	3.2105E+07	2.1590E-08	0.00E+00	0.0000E+00	1.29E-07	4.7730E+05
PD107	3.06E-02	1.00E+00	1	3.06E-02	2.0512E+14	3.3792E-15	0.00E+00	0.0000E+00	3.45E-09	1.2765E+04
SN121M	2.73E-01	1.00E+00	1	2.73E-01	1.7356E+09	3.9937E-10	6.02E-17	2.2274E-04	3.11E-09	1.1507E+04
SB125	7.10E+00	1.00E+00	1	7.10E+00	8.6150E+07	8.0458E-09	2.02E-14	7.4740E-02	3.30E-09	1.2210E+04
TE125M	1.73E+00	1.00E+00	1	1.73E+00	5.0112E+06	1.3832E-07	4.53E-16	1.6761E-03	1.97E-09	7.2890E+03
SB126	2.71E-02	1.00E+00	1	2.71E-02	1.0714E+06	6.4695E-07	1.37E-13	5.0690E-01	3.17E-09	1.1729E+04
SB126M	1.94E-01	1.00E+00	1	1.94E-01	1.1400E+03	6.0802E-04	7.50E-14	2.7750E-01	9.17E-12	3.3929E+01

Restore Point Estimates to Defaults

Restore All Defaults | View Notes | Show Report | Close

PCSA Tool - frmWorkerDry

Internal Worker Dose | Source Term | **Release Fraction by Group**

Release Fraction Source: User Specified

Description: User-Specified values (initially PCSA Tool defaults)

Group ID	Group Name	Release Fraction	Radionuclides In Group	Release Fraction Default	MinValue	MaxValue
Group 1	H-3	1.00E+00	H-3	3.00e-01	0.0	1.0
Group 2	Ruthenium	1.00E+00	Ru-106	1.50e-05	0.0	1.0
Group 3	Iodine	1.00E+00	I-129	1.00e-01	0.0	1.0
Group 4	Cesium	1.00E+00	Cs-134, Cs-135, Cs-137	2.30e-05	0.0	1.0
Group 5	Noble gases	1.00E+00	Ar-39, Kr-85, Rn-219, Rn-220, Rn-222	4.00e-01	0.0	1.0
Group 6	Strontium	1.00E+00	Sr-90	2.00e-06	0.0	1.0
Group 8	Co-60 Crud	1.00E+00	Co-60 Crud	1.50e-01	0.0	1.0
Group 9	Other particulates and fuel fines	1.00E+00	All others	2.00e-06	0.0	1.0

Restore Point Estimates to Defaults

Restore All Defaults | View Notes | Show Report | Close

George Adams May 28, 2004

Made PCSA Tool Version 3.0.0 BetaI available for testing on May 26, 2004. The following documents the changes for version BetaI.

George Adams 5-28-2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaI

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Summary of Changes
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Discussion of changes from BetaH to BetaI:

SCR507: Changed the About form to be modal.

SCR508: Made minor corrections to the CrystalWhatIf Crystal Report Effect on Other Functional Areas heading to ensure text was not being cut off.

SCR509: Upgraded the internal worker dose non-pool (Dry) calculation to handle the case were ventilation rate and leakage rate were the same and the room volumes were the same resulting in a divide by zero. Allowed leakage rate and ventilation rate to be specified as percent. Added the ability for the user to select the number of decimal places to display the output data.

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To install BetaI:
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<<The default installation directory is c:\program files\PCSATool.>>

PCSA Tool Version 3.0.0 BetaI will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

George Adams June 8, 2004

Bhavya Adams June 8, 2004

Made PCSA Tool Version 3.0.0 BetaJ available for testing on June 7, 2004. The following documents the changes for BetaJ.

Bhavya Adams 6/8/2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaJ

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Summary of Changes
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Discussion of changes from BetaI to BetaJ:

SCR507: Added highlighting for the entire row of a grid after the user edits an entry in the grid.

SCR509: Added Crystal Reports under Performance Assessment for the involved and noninvolved worker.

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To install BetaJ:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaJ will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaJ will be placed on a shared directory on Machine PITOR. The testers have read access to the following directory on Machine PITOR: DevShare. To upgrade to PCSA Tool Version 3.0.0 BetaJ, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolversion3.0.0BetaJ, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Bhavya Adams July 9, 2004

Doug Adams July 9, 2004

Made PCSA Tool Version 3.0.0 BetaK available for testing on July 9, 2004. The following documents the changes for BetaK.

Doug Adams 7/9/2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaK

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Summary of Changes
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Discussion of changes from BetaJ to BetaK:

SCR509: Added the Crystal Report for the Worker Dry form. This involved database changes to allow data to be
generated to the Crystal Report. Added highlighting for the involved and noninvolved worker performance assessment forms.

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To install BetaK:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaK will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaK will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaK, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaK, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams July 19, 2004

Doug Adams July 19, 2004

Made PCSA Tool Version 3.0.0 BetaL available for testing on July 19, 2004. The following documents the changes for BetaL.

readme.txt Doug Adams 7-19-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaL

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Summary of Changes
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Discussion of changes from BetaK to BetaL:

SCR508: Corrected an error in which editing a grid was not occurring on three forms if the user previously added an entry on a form. The three forms corrected were the Results Table (frmResultsTable), Results SSCITS Table (frmResultsSSCITSTable) and the FMEA Severe Events List (frmSelTable). When the user double clicked on a grid cell, if the mode was not properly set, then the form could try to add a record instead of editing an existing record.

SCR511: Replaced the sort routine within some FORTRAN modules to replace the quick sort that had been taken from Numerical Recipes. This change affected the following FORTRAN modules: pcsa_ietccdf, pcsa_totrisk, and pcsa_prob.

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To install BetaL:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaL will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaL will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaL, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaL, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams July 21, 2004

Bruce Adams July 21, 2004

Made PCSA Tool Version 3.0.0 BetaM available for testing on July 21, 2004. The following documents the changes for BetaM.

readme.txt Bruce Adams 7-21-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaM

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Summary of Changes
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Discussion of changes from BetaL to BetaM:

SCR509: Corrected errors observed while testing. On the takeaway analysis form and Crystal Report, the SSC total dose would not always be consistently highlighted between the compliance assessment, takeaway analysis, and Crystal Report. Also modified display units on the takeaway analysis form and Crystal Report to be consistent. Corrected the safety assessment combinations form to lock the summary dose fields. Added the dose rate to the takeaway analysis Crystal Report for the noninvolved worker. Modified the error message displayed when a user tries to edit a field that cannot be edited to display the list of fields which can be edited in order from left to right.

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To install BetaM:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaM will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaM will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaM, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaM, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Bruce Adams 7-29-04

Bunny Adams July 23, 2004

Made PCSATool Version 3.0.0 BetaN available for testing on July 28, 2004. The following documents the changes for BetaN.

readme.txt Bunny Adams 7-23-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaN

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Summary of Changes
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Discussion of changes from BetaM to BetaN:

SCR511: Removed references to the SysDescription table formerly present in the database

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To install BetaN:
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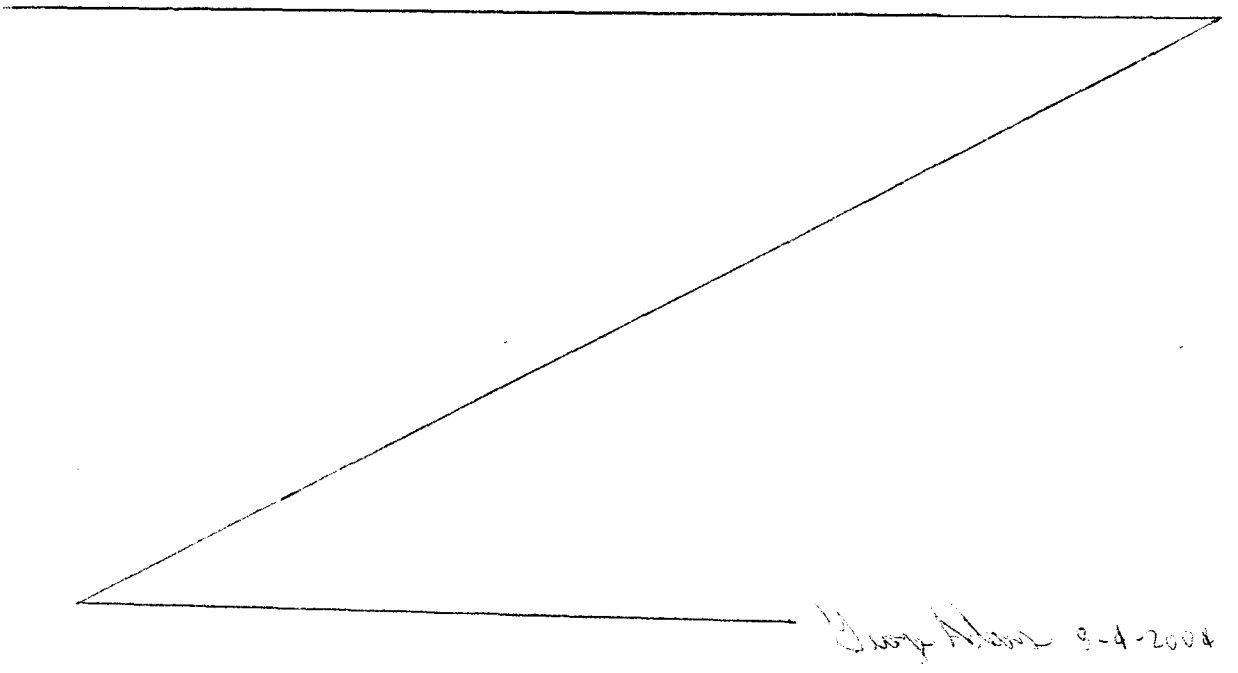
<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaN will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaN will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaN, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaN, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.



Bunny Adams 9-4-2004

George Adams August 4, 2004

Made PCSA Tool Version 3.0.0 BetaO available for testing on August 4, 2004. The following documents the changes for BetaO.

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaO

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Summary of Changes
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George Adams 8-4-2004

Discussion of changes from BetaN to BetaO:

SCR510: Added the downwind worker dose model

SCR512: Modified the Crystal Report for Performance Assessment Takeaway Analysis to include the Scenario (probabilistic or deterministic)
Added a ChDrive command to precede ChDir commands in the code to ensure that prior to executing a change directory command,
the correct drive is the default drive.

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To install BetaO:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaO will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaO will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaO, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaO, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

George Adams August 5, 2004

Doug Adams August 5, 2004

Made PCSATool version 3.0.0 BetaP available for testing on August 5, 2004. The following documents the changes for BetaP.

Doug Adams 8-5-2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaP

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Summary of Changes
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Discussion of changes from BetaO to BetaP:

SCR510: Corrected an error in which the dose by radionuclide was not being scaled. Also, modified the caption on the RSAC forms to indicated Public RSAC runs or Controlled Area Worker RSAC runs.

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To install BetaP:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaP will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaP will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaP, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaP, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

PCSA Tool Changes, 5/28 to 5/26/2004, D. Stead

SCR507:

1. frmEnergyAnalSELTable, frmEnergyAnalysisTable, frmEventSequenceTable, frmFaultTreeEventTable, frmHRA_SELTable, frmHRATable, frmResultsTable, frmResultsSSCITSTable, frmSELTable, frmSSC_Data, frmWhatIfSELTable: Changed call to 'gHighlightGridCellOrRow' to highlight the entire row.

SCR509:

1. frmResultsTable:
   Added 'Dose Rate (rem/hr)', enabled cmdSSCITS for all modes.
   Moved dose-summing code to mdlYMPModule1. Added code to highlight dose values that are over limit.

2. frmResultsSSCITSTable:
   Added code for Worker Dose data, widened form and grid to allow better viewing of data with the increased number of columns, and to allow editing of Worker Dose value.

3. frmSafetyAssessmentSSCITS:
   Added code for Worker Dose mode, and hide Dose Type selection frame for Worker Dose mode.

4. frmWorkerDry:
   Added source information (text) for Dose Conversion Factors.

5. mdlYMPModule1:
   Added 'gHighlightCellIfOverLimit' to highlight the referenced cell in a referenced MSFlexGrid that has a numeric (dose) value that is over a given limit. It is called by 'gHighlightCellsInResultsGrid', which works with frmResultsTable to highlight high-dose cells.
   Added 'gSumWorkerDoses_forTEDE', to sum doses for the Results Table.

SCR510:

1. frmRSAC_WkrInput:
   This form was created to 'walk' the user through a procedure to determine the proper way to run RSAC for Worker Dose mode. The procedure was provided by our scientific consultant, Norman Eisenberg. It has six frames, in which the user enters various parameters or answers a question. When the proper RSAC mode has been determined, frmRSAC_Main is loaded and its Meteorlogical input data preset to run as needed. The user then can change input parameters (other than those preset by frmRSAC_WkrInput) as desired, and run RSAC (in deterministic mode only). The input and output data are displayed in the usual manner, with the exception that the Ingestion Dose input and output data tabs are both disabled, since there is no Ingestion dose for Worker Dose mode.

2. frmRSAC_Main:
   Added code to set the Meteorological input data to the values determined in frmRSAC_WkrInput. Added code to read the RSAC 6 output file directly and save the data to the output data table in the database. This was required, since there is no Ingestion dose, and the FORTRAN code 'PCSAProb.exe' returns an error if the Ingestion dose component is missing. Added code to save and restore Worker Dose RSAC runs.

3. frmLaunchRSAC:
   Added code to use a newly created batch file 'RSAC6wkr.bat' for Worker RSAC Mode, or the existing 'rsac6.bat' for Public mode.

4. frmReadRSAC:
   Added code to check for existence of 'rsac6.out' for Worker RSAC Mode, or 'pcsarsac.dat' for Public mode (as used before).

5. mdifrmMain:
   Modified the Consequence menu to add 'RSAC' under 'Worker Dose', and go directly to 'RSAC' under 'Public Dose'; 'Advanced RSAC Input' was moved from 'Public Dose' to the bottom of the Consequence menu, since it can be used for either Public or Worker mode analyses.

6. mdlYMPModule1:
   Added 'gbRSACWorkerMode' flag to indicate that RSAC is being run in Worker Dose mode.

David Cleland, 8/5/2004

8/5/04

8/5/04

Doug Adams August 10, 2004

Made PCSA Tool version 3.0.0 BetaQ available for testing August 10, 2004. The following documents the changes for BetaQ

readme.txt Doug Adams 8-10-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaQ

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Summary of Changes
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Discussion of changes from BetaP to BetaQ:

SCR513: Added a Crystal Report for the Software Systems form and corrected this form to only allow unique system ids and system descriptions. Modified the Initiating Event Crystal Report to correct the font for uncertainty and time periods and modified the Event Sequence Crystal Report to include Applicability of the Event (P, W, B). Modified the menu help to instead refer to the User's Guide. Modified the About Box to include new contact information. Corrected the performance assessment results tables to only display event sequences for event scenarios marked as included for performance assessment.

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To install BetaQ:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaQ will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaQ will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaQ, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaQ, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams 8-11-2004

Doug Adams August 17, 2004

Made PCSA Tool version 3.0.0 BetaR available for testing August 16, 2004. The following documents the changes for BetaR.

readme.txt Doug Adams 8-17-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaR

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Summary of Changes
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Discussion of changes from BetaQ to BetaR:

SCR514: Modified the tab order on the WhatIF, Energy Method, Fault Tree, and Event Tree forms, added images to the database, modified the failure probability form to no longer require a letter id and removed data associated with deleted references. Added new images to the database. Also modified the images grids to allow variable row heights because some of the captions for the images were long. Modified the downwind worker dose form to reflect that the worker is on the same surface of the building as the stack and is in or near the stack flow. Modified the system description tabs to limit the size of text fields to 15 characters.

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To install BetaR:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaR will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaR will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaR, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaR, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams 8-18-2004

Doug Adams August 18, 2004

Make PCSA Tool version 3.0.0 BetaS available for testing August 18, 2004. The following documents the changes for BetaS.

readme.txt Doug Adams 8-18-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaS

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Summary of Changes
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Discussion of changes from BetaR to BetaS:

SCR531: Upgraded SAPHIRE software from version 6.70 to version 6.80

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To install BetaS:
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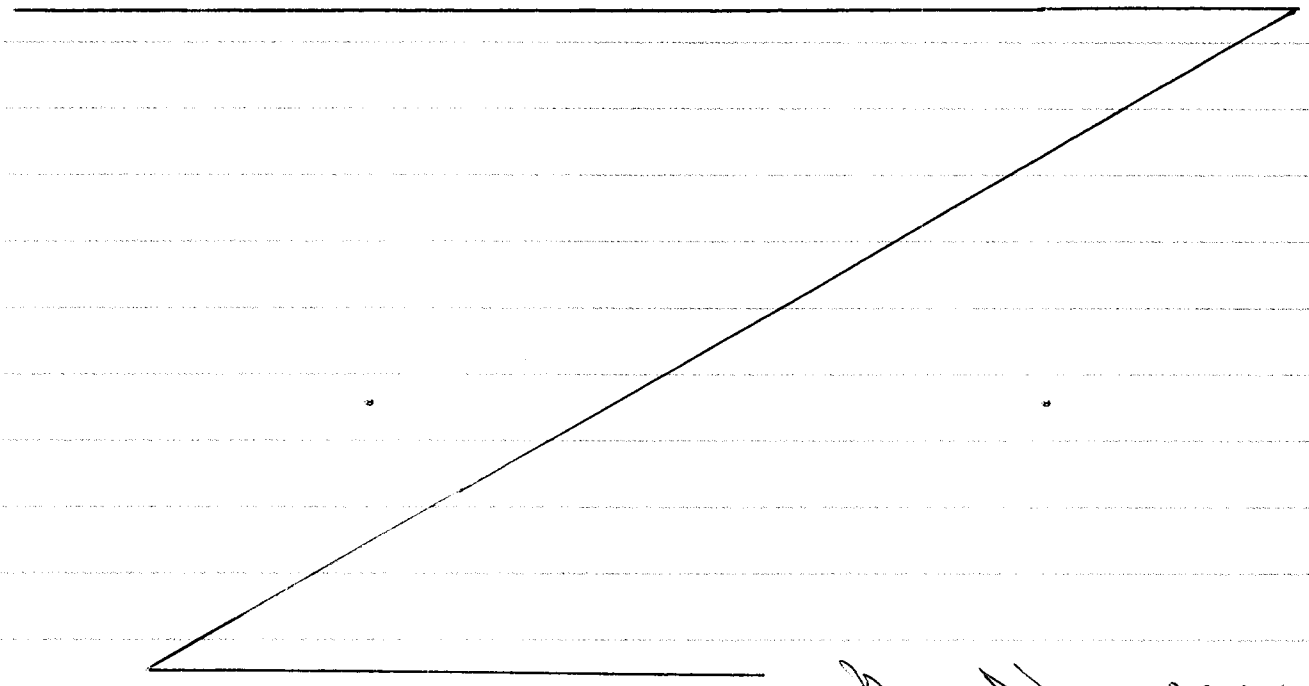
<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaS will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaS will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaS, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaS, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.



Doug Adams 9-3-2004

Doug Adams September 3, 2004

Made PCSATool version 3.0.0 BetaT available for testing September 3, 2004. The following documents the changes for BetaT.

readme.txt Doug Adams 9-3-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaT

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Summary of Changes
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Discussion of changes from BetaS to BetaT:

SCR537: Made the following set of changes:
1) Corrected the SSC Data form to no longer search for an empty string when comparing SSC identifiers.
2) Corrected the System Log/System Log Entry functionality such that when a project is already open and the user decides to open a new project or create a new project, the System Log/System Log Entry forms are displayed on leaving the existing project. When the next project is subsequently opened, its System Log is displayed if there are any records to display.
3) For the System Description form, Operation Sequence tab, made the Edit Record button visible regardless of whether or not operation sequence records exist. In addition, for the Function tab and the Human Actions tab, changed the Edit Record button to instead display 'Edit.'
4) Modified the Worker Dry form to clear output doses after the user restores point estimates to defaults and after a release fraction source is selected.

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To install BetaT:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaT will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaT will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaT, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaT, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams 9-9-2004

Diana Adams September 9, 2004

Made PCSA Tool version 3.0.0 BetaU available for testing September 9, 2004. The following documents the changes for BetaU.

readme.txt Diana Adams 9-9-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaU

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Summary of Changes
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Discussion of changes from BetaT to BetaU:

SCR539: Made the following set of changes:
1) Added the 'Additional Information' field to the SSC Data Crystal Report.
2) Added the 'Saphire Data Path' and 'Include for Performance Assessment' fields to the Event Tree Crystal Report.
3) Added the 'Saphire Data Path' field to the Fault Tree Crystal Report.

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To install BetaU:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaU will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaU will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaU, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaU, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Diana Adams 9-13-2004

Doug Adams September 13, 2004

Made PCSA Tool version 3.0.0 BetaV available for testing September 13, 2004. The following documents the changes for BetaV.

readme.txt Doug Adams 9-13-2004

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaV

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Summary of Changes
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Discussion of changes from BetaU to BetaV:

SCR540: Made the following set of changes:
1) Updated the SSC Design Bases and Design Criteria Crystal Report to match SSC ID when retrieving records from the database for "Functions, Hazards, Initiating Events, and Event Tree Subsequent Events."
2) For the case where an SSC is being edited, modified the SSC Data form to no longer enable the SSC ID text field when design bases and design criteria exist for the SSC.
3) Disabled the Design Bases and Design Criteria tab when an SSC is being added or edited.

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To install BetaV:
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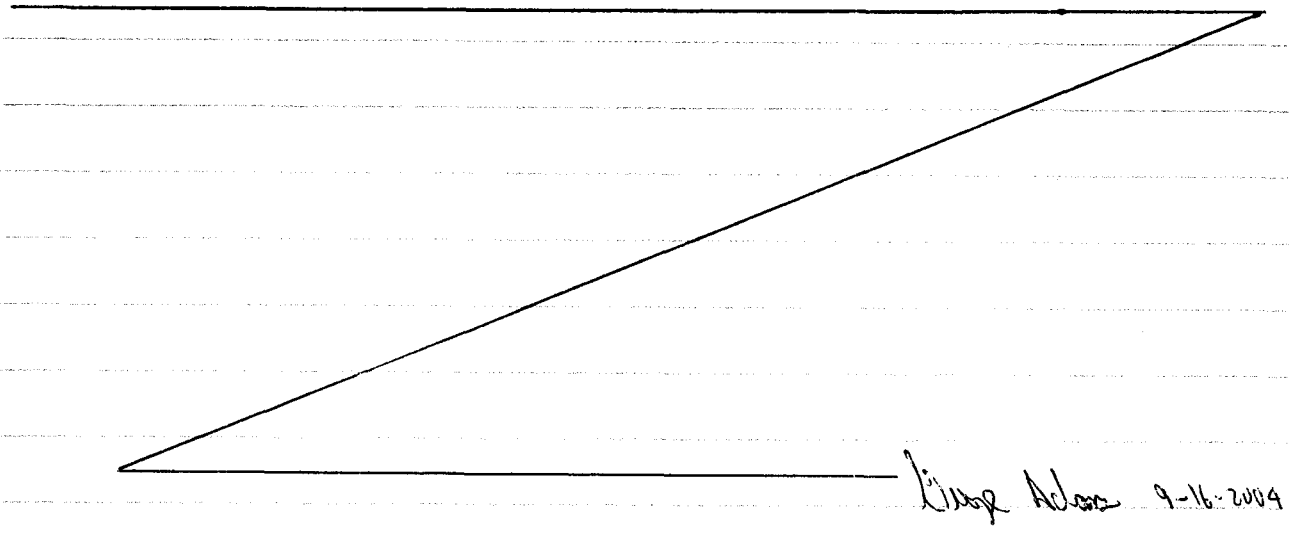
<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaV will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaV will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaV, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolversion3.0.0BetaV, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.



Doug Adams 9-16-2004

Doug Adams September 16, 2004

Made PCSA Tool version 3.0.0 BetaW available for testing September 16, 2004. The following documents the changes for BetaW.

Doug Adams 9-16-2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0 BetaW

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Summary of Changes
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Discussion of changes from BetaV to BetaW:

SCR541: Made the following set of changes to the Risk Assessment portion of the software:
1) When file lhs.inp is generated, reformatted the output to the file to allow the FORTRAN code to correctly read the number of realizations.
2) Modified the risk assessment form to check the number of realizations after the user performs an event scenario risk calculation.
3) Modified the calculation of percent contribution to check for a zero total risk.

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To install BetaW:
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<<The default installation directory is c:\program files\PCSATool.>>

[NEW INSTALLATION]: A new installation of PCSA Tool Version 3.0.0 BetaW will be installed by invoking the setup.exe executable on the deployment media under the folder DISK1.

[UPGRADE]: An upgrade may be performed as follows:
PCSA Tool Version 3.0.0 BetaW will be placed on a shared directory on Machine PITOR or on a CD. Testers have read access to the following directory on Machine PITOR: DevShare.
To upgrade to PCSA Tool Version 3.0.0 BetaW, from within Windows Explorer, go to My Network Places==>Microsoft Windows Network==>Cnwra==>Pitor==>DevShare==>runversion. Within the directory, PCSAToolVersion3.0.0BetaW, copy the PCSATool directory to a directory on the tester's machine. From the PCSATool directory, the tester may create a shortcut to the program executable, pcsatool.exe.

Doug Adams 9-17-2004

Doug Adams September 17, 2004

Created PCSA Tool Version 3.0.0 for release using PCSA Tool Version 3.0.0 Beta W. The following documents the installation steps for installing PCSA Tool Version 3.0.0.

Doug Adams 9-17-2004

readme.txt

Installation instructions for installing the PCSA Tool Version 3.0.0

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TO install PCSA Tool Version 3.0.0:
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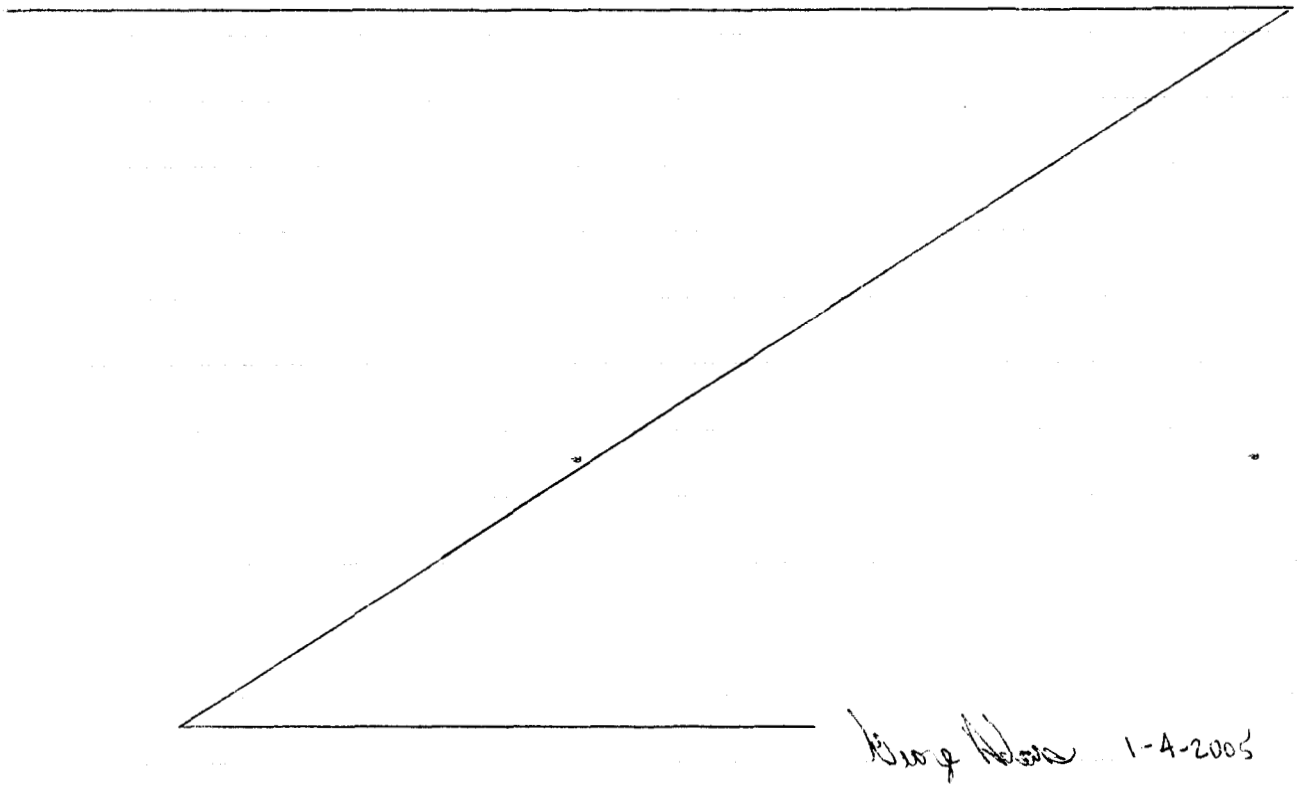
PCSA Tool Version 3.0.0 will be installed by invoking the setup.exe executable on **the** deployment media under the folder DISK1.

After invoking setup.exe, a series of installation screens are displayed as part of **the** InstallShield wizard. The PCSA Tool is installed by entering information or invoking commands on the screens. The following describes the screens:
Screen 1: Welcome Screen: Identifies the InstallShield Wizard for PCSAToolVersion3.0.0.
Screen 2: Customer Information: Enter User Name and Organization
Screen 3: Destination Folder: By default, the software is installed to C:\Program Files\PCSATool\. The user has the option of changing the destination folder.
Screen 4: Ready to Install: Click Install to start the installation.
Screen 5: Status Screen: Displays the progress of the installation.
Screen 6: Completion Screen: Click Finish to exit the InstallShield wizard.
Screen 7: Restart Prompt: Click Yes to restart the machine and allow configuration changes to be made.



Doug Adams 1-4-2005

Doug Adams January 4, 2005

Made PCSA Tool Version 3.0.1BetaA available for testing January 4, 2005. The following documents the changes for BetaA.

Doug Adams 1-4-2005

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Summary of Changes
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Discussion of changes from version 3.0.0 to 3.0.1BetaA:

SCR542: Corrected errors observed while developing an example problem. The following summarizes the changes made:
1) Crystal Reports summarizes the data when two points have the same x-value. The summary option formerly chosen was to sum the data. This resulted in the corresponding y-values being added when x-values were the same. X-values would be the same for a higher number of realizations due to round-off errors. To correct the problem, in Crystal Reports, the maximum was selected for the summary option. In addition, the y-axis scale was bounded to between 0.0 and 1.0.
2) Corrected the update functionality on the System Description, General Tab for ventilation flowrate to check if a value was entered before checking if it was numeric. This change allows the user to not enter a ventilation flowrate.
3) Modified the Human Actions Tab to no longer identify categories A, B, C, and D. Also, modified the Operation Sequence Tab to spell traveled correctly (formerly spelled travelled).
4) Corrected the initiating event form to populate the severe events table. Wrote a common module, gFillInternalEvents, to populate the severe events table for both the severe events form and the initiating event form.
5) For Energy Method Events, modified the type/item displayed so that the leftmost three characters of the event category are included with the type. This allows different energy method records with the same item number to be distinguished from each other.
6) Corrected the Event Tree Form, Subsequent Events Tab to allow the user to enter duplicate event ids.
7) Corrected the Event Tree Subsequent Events tab to allow the user to select 'None' if no SSC is desired for the subsequent event. The user can select 'None' for any number of subsequent events. This allows the user to make changes or reselect SSCs for subsequent events.
8) The SSC Data Crystal Report was corrected to only display SSC data for the associated functional id.
9) Modified the current level results grid within the PCSA Tool and the associated Crystal Report to display the End State instead of the Description field.
10) Modified the Event Tree Form Subsequent Events so that the Uncertainty Data and Link Details fields are editable regardless of the state of the corresponding Yes-No fields (Uncertainty and Linking).
11) Sample data was removed from table ExternalAndNaturalEvents for the avalanche record within the template database.
12) Combined the Duration of Operation, Lift Height, Distance Traveled, and Speed of Travel fields together into a single row on the System Description Form, Operation Sequence Tab Crystal Report.
13) Updated the SSC Data form Design Bases and Design Criteria tab to remove hazards, initiating events, and event trees from the database when a design basis or criteria is removed. Modified the hazards tab in the secondary grid to allow the user to select a hazard from lists of external and internal hazards.
14) Updated the deterministic default for wind speed from 3 m/s to 4.3 m/s and the probabilistic default for wind speed to a User Supplied Discrete distribution with the following wind speed (m/s), probability pairs: 0.9,0.25 2.55,0.29 4.35,0.20 6.95,0.18 9.75,0.06 12.25,0.02. This change affected tables RSAC Meteorological Data, RSAC_LHS_Table, and WkrRSAC Meteorological Data.

Doug Adams January 7, 2005

Made PCSA Tool Version 3.0.1 BetaB available for testing January 7, 2005. The following documents the changes for BetaB.

Doug Adams 1-7-2005

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Summary of Changes
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Discussion of changes from version 3.0.1BetaA to 3.0.1BetaB:

SCR543: Upgraded the database from Access 97 to Access 2000. Modified the error message within frmRSAC_Main to generate an information message instead of an error message when
deleting tables and not all tables are deleted since this is expected for replicable tables.

Doug Adams February 11, 2005

Made PCSA Tool Version 3.0.1 BetaC available for testing February 11, 2005. The following documents the changes for BetaC.

Doug Adams 2-11-2005

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Summary of Changes
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Discussion of changes from version 3.0.1BetaB to 3.0.1BetaC:

SCR543: Modified the Crystal Reports to remove the report reference when unloading the Crystal Report.

SCR544: Made the following changes
1) Modified the SSC Design Bases and Design Criteria Crystal Report to sort records by item number.
2) The User Guide in PDF format with links from the table of contents was added to the Help Menu. Also, a directory, "Help" was created which contains the User Guide. Corrected the file launch routines to check for return values for errors less than or equal to 32.
3) Made the Operation Sequence Report subheadings plain text instead of bold. Adjusted the Energy Method Crystal Report Additional Information heading.
4) Removed demo files from the PCSA Tool setup to include PCSADemo.mdb, PCSADemo directory, Working.mdb, IWorking.mdb, and Saphire Projects directories: Demo, YMP1, and Ymp1_ATS1.
5) Converted the CheckLst database to Access 2000 format.
6) Corrected the popup window for event tree subsequent events to no longer request a unique event id.

Doug C Adams 5-24-2005

Doug L Adams May 24, 2005

Made PCSA Tool Version 3.0.1 Beta D available for testing May 23, 2005. The following documents the changes for Beta D.

Doug L Adams 5-24-2005

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Summary of Changes
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Discussion of changes from version 3.0.1BetaC to 3.0.1BetaD:

SCR545:
1) Removed ITS staff determination from the SSC Data and View Selected SSCs form.
2) Added Design Basis Ground Motion to the SSC Data and View All form.
3) Removed the Additional Info field and replaced with a Staff Comments field. Added an ITS Evaluation field. Made ITS Evaluation and Staff Comments editable from the View Selected SSCs form. Added a Crystal Report to the View Selected SSCs form.
4) The Design Review Comment and Additional Information fields were removed from the Design Bases and Design Criteria tab of the SSC Data form, and are now copied as empty fields when the Copy Record button is used. These fields are viewable and editable on the View Selected SSCs form.

SCR581:
1) Added Copy Scenario button and associated code to the Event Tree form to copy an entire event scenario to include subsequent events.
2) Updated the Event Tree form Subsequent Events tab to remove Linking and Link Details fields and add Link to Fault Tree and Additional Info fields. Also updated these fields in the EventTree_SubseqEvents and EventTree_Report tables of the database. Updated these fields in the Crystal Report as well.
3) Removed the data environment from the project.
4) Added a reference to a global bit to ensure that the user cannot select another functional area with the System Description form open.
5) Modified the Crystal Reports on the Operation Sequence tab, Waste Characterization tab, Shielding tab, Fire Hazards tab, and Assumptions tab of the System Description form to sort records in the Crystal Report according to item number.

Doug L Adams July 1, 2005

This entry is a continuation of the initial entries from page 1. The objectives and personnel qualifications are described below:

Objectives:

The objective of this task is to continue the development of the Preclosure Safety Analysis (PCSA) Tool to provide the NRC/CNWRA the capability to conduct selected safety analyses. The tool will be used to perform systematic hazard, event sequence, and consequence analyses. The PCSA software will be used to conduct Failure Mode and Effects Analysis (FMEA), What-If Analyses, Event Tree and Fault Tree Analyses and radiological dose calculations. The PCSA software

includes a Graphical User Interface (GUI) developed in Visual Basic. The software will also access RSAC, MELCOR, and SAPHIRE ~~compt~~ computer programs. This notebook documents the design and construction of the PCSA Tool.

Doug R Adams 7-1-2005

Personnel Qualifications:

Personnel qualifications and skills are: environmental engineering, health physics, and radiological consequence analysis; civil / structural / geo-technical engineering and risk analysis; chemical engineering, computer science, and risk analysis.

Doug R Adams August 29, 2007

Made PCSA Tool Version 3.0.1 BetaE available for testing August 29, 2007. The following documents the changes for BetaE.

Doug R Adams 8-29-2007

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Summary of Changes
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Discussion of changes from version 3.0.1BetaD to 3.0.1BetaE:

SCR584:
1. For the deterministic case, the 'pcsa_prob' FORTRAN code was modified to allow it to continue to run when it encounters missing dose information in the RSAC output file. On the 'Summary Results' tab, components for which a dose was not calculated by RSAC are not shown (the output tab and option button are disabled for this case).
2. The database was modified to set the default Release Fraction for Strontium-90 to logtriangular: 2e-6, 2.3e-5, 2.5e-4 for the probabilistic case and 2.3e-5 for the deterministic case.
3. For the probabilistic case, the 'pcsa_prob' FORTRAN code was modified to allow it to continue to run when it encounters missing dose information in the RSAC output file. On the 'Summary Results' tab, components for which a dose was not calculated by RSAC are not shown (the output tab and option button are disabled for this case).
4. The Visual Basic code was modified to include Submersion in the top radionuclide contributors list on the 'Totals' tab. The title on the plots was changed to, 'RSAC OUTPUT - Radionuclide and/or Submersion Contribution to Total Dose.' Corresponding changes were also made to the Crystal Reports code to generate the reports corresponding to these Visual Basic screens.
5. For RSAC Input, Inhalation Dose -> For Inhalation, Breathing Rate (m^3/s), the remark was changed in the database to: float - RSAC default for light activity.
6. An 'ORDER By' clause was added to the SQL statement for the 'Summary Results' grid to assure correct order of the records in the grid, and correct display of the bar chart. In addition, the Crystal Reports were update to use the 'ORDER By' clause.
7. The RSAC output grids were widened, and the column widths adjusted to avoid cutting off field names.

Doug R Adams 8-29-2007

Doug Adams March 24, 2003

Support files were placed on CD and include the following: (Label: ~~SNL14 Support Files~~ DLA 3-24-2003)

(1) Software Releases:

(a) PCSA Tool Version 3.0.0 BetaN

(b) PCSA Tool Version 3.0.0

(c) PCSA Tool Version 3.0.1 BetaC

(2) Run-Time Versions

(a) PCSA Tool Version 3.0.0

(b) PCSA Tool Version 3.0.1_BetaC

(c) PCSA Tool Version 3.0.1_BetaD

(d) PCSA Tool Version 3.0.1_BetaE

(3) Baseline Version

(a) FORTRAN codes (5-9-03)

(b) PCSA Tool v.2.0.2

(4) Development Versions

(a) PCSA Development_12-15-03.zip

(b) Beta archives for Version 3.0.0 development:

PCSADevelopmentBetaA.zip through PCSADevelopmentBetaW.zip

(c) PCSADevelopment 3.0.0.zip

(d) Beta archives for Version 3.0.1 development:

PCSADevelopment3.0.1BetaA through PCSADevelopmentBetaE.zip

(5) Build Files

(a) PCSAbuild_v3.00_BetaA through PCSAbuild_v3.0.0_BetaW

(b) PCSAbuild_V3.0.0

(c) PCSAbuild_V3.0.1_BetaA through PCSAbuild_V3.0.1_BetaE

(d) PCSAbuild_v3.0.1_BetaRepl

Doug Adams March 24, 2008

Support files placed on CD (continued): ~~(SW 614 Support Files)~~ bAA 3-24-2008

(6) Modification Table

PCSATool - Modifications.wpd describing potential changes to the code

(7) Software Change Requests (SCRs)

(a) SCR 542

(b) SCR 543

(c) SCR 544

(d) SCR 545

(e) SCR 581

(f) SCR 584 (Twelve CDs are included total)

Doug Adams March 24, 2008

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK NO.614

Document Date:	03/28/2006
Availability:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, Texas 78228
Contact:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, TX 78228-5166 Attn.: Director of Administration 210.522.5054
Data Sensitivity:	■"Non-Sensitive" □ Sensitive □"Non-Sensitive - Copyright" □ Sensitive - Copyright
Date Generated:	03/28/2008
Operating System: (including version number)	Windows
Application Used: (including version number)	Windows XP
Media Type: (CDs, 3 1/2, 5 1/4 disks, etc.)	12 CDs
File Types: (.exe, .bat, .zip, etc.)	Exe., jpf,. Out, txt, dat., rpt., ini, cab., msi, wpd
Remarks: (computer runs, etc.)	Media contains: Software change forms, tables, development plan, run-time