

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-231		
02. Project Title: TPA Code Activity		Project Number: 20-1402-762
03. SPCR Title: Seismo modification for realistic WP failure		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
SEISMO Module, seismo.f version 0.1 EXEC, sampler.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<ul style="list-style-type: none"> <li>The assumption that rocks under one rock condition are assumed to fail at the same time responding to a seismic event is too conservative.</li> <li>Lack of capability for considering backfill effect</li> <li>Lack of capability of evaluating effect of ground acceleration greater than 0.4g.</li> </ul>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<ul style="list-style-type: none"> <li>Add a variable with a lognormal distribution to relax the assumption that the entire rock will fail under one rock condition subjected to a seismic event</li> <li>Add capability for evaluating backfill effect</li> <li>Add capability for evaluating effect of ground acceleration greater than 0.4g</li> </ul>		
07. Originator: Simon Hsiung	Title: Principal Engineer	Date: 4/2/98
PROJECT		
08. Need by Date: 4/6/98	09. Approved: <input checked="" type="checkbox"/>	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/2/98	
11. Element Manager: Helen Wittmeyer	Date: 4/6/98	
12. IMPLEMENTED SOLUTION		
<p>Modification identified in #06 were implemented. A new parameter SeismicHeterogeneityFactor was introduced that is now multiplied with SeismicSpacing to have only a fraction of WP in contact with all WP's failing under a particular rock type.</p>		
13. Implemented By: Simon Hsiung, Ron J., R. Rice		Date: 4/6/98

Attached are the files containing the test results to verify the new implementation.

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-230		
02. Project Title: TPA Code Testing		205706-7622 Project Number:
03. SPCR Title: Time varying DCF'S.		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Exec.f dcagw.f      (dcags.f)		
05. DESCRIPTION OF PROBLEM/CHANGE		
Currently only one DCF file is used based on a pair of values for Precipitation and temperature hard coded in exec.f.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Enable a Time history of precipitation + Temperature <del>to</del> to be used, while selecting The appropriate dcf file.		
07. Originator: Mohanty	Title:	Date: 4-2-98
PROJECT		
08. Need by Date: 4/6/98	09. Approved: <input checked="" type="checkbox"/>	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/2/98	
11. Element Manager: Gordon Wittmeyer	Date: 4/6/98	
12. IMPLEMENTED SOLUTION		
Two new arrays AAP and AAT were added to exec.f. Arguments dMAP and dMAT for 'dcagw' and 'dcags' were converted to arrays.		
13. Implemented By: M. Janz		Date: 4-4-98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-229		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Multiply groundwater dose for drinking water by Fraction of Plume Mass captured		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
In printing the drinking water dose to "smpkdos.res", the fraction of plume captured was not multiplied by the dose from dcagw.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The fraction of plume captured needs to be multiplied by the dose from dcagw.		
07. Originator: R. Rice	Title: Consultant	Date: 4/2/98
PROJECT		
08. Need by Date: 4/6/98	09. Approved: <input checked="" type="checkbox"/>	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/2/98	
11. Element Manager: Gordon Wittmeyer	Date: 4/6/98	
12. IMPLEMENTED SOLUTION		
Implemented as described above		
13. Implemented By: R. Rice		Date: 3/11/98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-228		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Single vs Double Precision Differences in NEPTRAN Results		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
u2ft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Running NEPTRAN with single precision and with double precision can result in a format that has 2 lines instead of 1 line in u2ft.f. This is a potential problem when u2ft reads the nefii.dis file.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
When writing the discharge file, NEPTRAN can write an additional line in nefii.dis because of a free formatted write statement. u2ft, as currently implemented, reads the line and the following line is read as release rates instead of as a continuation of the previous line. Consequently, u2ft may report these values as releases instead of the actual NEPTRAN results.		
07. Originator: CNWRA	Title:	Date: 4/2/98
PROJECT		
08. Need by Date: 4/6/98	09. Approved: ✓	Disapproved:
10. Software Developer: S. Mohanty et al.	Date:	
11. Element Manager: Gordon Wittenberg	Date: 4/6/98	
12. IMPLEMENTED SOLUTION		
Modify u2ft to read values for each nuclide in a chain, instead of reading the line and then continuing to read the following line (expecting values for release rates).		
13. Implemented By: R. Rice	Date: 3/11/98	



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-227		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Increase Array Dimensions for # Time Steps in nefi.dis		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
nefms.f uzft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
NEPTRAN can write more time steps to the nefi.dis file than the max number in uzft.f (9,999)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
increase array dimension in uzft.f, and modify the nefms.f write and uzft.f read formats from "i4" to "i5"		
07. Originator: R. Janetzke	Title: Analyst	Date: 2-4-98
PROJECT		
08. Need by Date: 2-20-98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 2-18-98	
11. Element Manager: RG Rana	Date: 2/18/98	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06.		
13. Implemented By: R. Rana		Date: 2/18/98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-226		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Modify TPA Code Names to Reflect Sat Zone Layer Names		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tpa.inp      szff.f strmtube.dat      tpanames.db5		
05. DESCRIPTION OF PROBLEM/CHANGE		
Saturated Zone Layer were changed (used only TUFF & alluvium) and the tpa.inp parameter names <del>was</del> for alluvium (w/ no matrix diffusion) were inconsistent with a layer that can have matrix diffusion.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
TPA INP paramete names changed (STPP is now STFF, no STAC, no SUAF) and no SATV names with matrix diffusion) and since there could now be <del>more than</del> consecutive sat. zone layers with the same name, these legs were unlabeled in the NEPTAN <del>the</del> input file.		
07. Originator: T. McCartin	Title: Analyst	Date: 1-15-98
PROJECT		
08. Need by Date: 2-20-98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et. al,	Date: 2-09-98	
11. Element Manager: R. B. Bae	Date: 2-18-98	
12. IMPLEMENTED SOLUTION		
Implemented as described above in section 06.		
13. Implemented By: R. R. R. R.		Date: 2/09/98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-225	
02. Project Title: TPA Code Testing	20..5708-7622 Project Number:
03. SPCR Title: Modify TPA Code for Cladding Correction Factor	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
tpa.inp      releaset.f      ebsrel.def tpaname.db      ebsrel.f	
05. DESCRIPTION OF PROBLEM/CHANGE	
Add a correction factor for cladding (multiplied by the total surface area (internal) in the wetted portion of SF)	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
Modify the 5 files listed in section 04 to add this correction factor (need to add parameters to tpa.inp, write it to ebsrel template, & perform the calculation in releaset.f)	
07. Originator: R. Codell	Title: AnalYST      Date: <del>1-26-98</del> 1-26-98 RQ
PROJECT	
08. Need by Date: 2-20-98	09. Approved:      Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 1-26-98
11. Element Manager: R. Rice	Date: 2/18/98
12. IMPLEMENTED SOLUTION	
Implemented as described above in section 06	
13. Implemented By: R. Rice	Date: 1/26/98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-224		
02. Project Title: TRA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Add option to Release for a flow through model		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ebsrel.def ebsrel.f      tra.inp release.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Change involved incorporating NRC's (from D. Codell) modifications to allow the user to select between a bath tub model and a Flow through model (note that the bath tub model, only, was originally in release)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modifications to release.f and to the prompt input file (ebsrel.def), to ebsrel.f and to tra.inp were required to make add the option to select between models		
07. Originator: R. Codell	Title: NRC	Date: 1/14/98
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 1/15/98	
11. Element Manager: Z. Bae	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rice	Date: 1/15/98	

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-223		
02. Project Title: PA Code		20-5708-7622 Project Number:
03. SPCR Title: Screen Print for "no release"		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>"no release" is printed to the screen when the ranked releases/doses have the 6th largest value = 0 → these are cases where either 1, 2, 3, 4 or 5 releases/doses are nonzero + these nonzero values should be printed to the screen instead of, "no release"</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>modify exec.f to screen print the largest 6 releases/doses (which it does now) and if there are less than 6 nonzero releases/doses, screen print only those nonzero values (for all zeros, screen print "no release")</p>		
07. Originator: R-Rice	Title: Consultant	Date: 10/13/97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 1/14/98	
11. Element Manager: RG Bacco	Date:	
12. IMPLEMENTED SOLUTION		
<p>modified exec.f to screen print the Problem Solution as described in section 06 above (see attachment exec.f.diff)</p>		
13. Implemented By: K. Ricci	Date: 1/14/98	

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-222		
02. Project Title: TPA Code		20-5108-762 Project Number:
03. SPCR Title: Leg Specific Dispersion Factors (SZ)		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
SZFT.F, TPA.INP		
05. DESCRIPTION OF PROBLEM/CHANGE		
The dispersion values for the SZ legs need to be individually calculated from individual user specified factors.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add input parameters for the saturated zone leg dispersion factors.		
07. Originator: McCartin	Title: NRC	Date: 1-8-98
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mahaty et al.	Date: 1/8/98	
11. Element Manager: R. Barea	Date:	
12. IMPLEMENTED SOLUTION		
Dispersion fraction, Minimum Residence Time Variables were added to the Tpe.inp file. SZFT.F was modified to read and use these new variables		
13. Implemented By: R. Janitzke		Date: 1-14-98

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-221		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Add Error checks for reading the NEFTTRAN file "neftii.dis"		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
u2ft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
if NEFTTRAN uses more than 9,999 time steps & writes that to the neftii.dis file, the tpa code (u2ft.f) should print an error message to the screen — (the max. dimension is four digits, otherwise *** is written to the file neftii.dis)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add error checks for reading the file "neftii.dis" and to print this message to the screen.		
07. Originator: S. Mohanty	Title: Analyst	Date:
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 1/14/98	
11. Element Manager: RG Bore	Date:	
12. IMPLEMENTED SOLUTION		
Add error checks, etc, as described above in section 06		
13. Implemented By: F. Kice		Date: 1/14/98

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-220		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: CCDF Handler for Peak Dose		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tccdf.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
tccdf.f does not compute a ccdf for Peak Dose.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add a peak dose ccdf output file.		
07. Originator: Mohanty	Title: Analyst	Date: 1-9-98
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 1/9/98	
11. Element Manager: RG Bae	Date:	
12. IMPLEMENTED SOLUTION		
Subroutine tccdfpkd was implemented to create peak dose ccdf file 't PKdccdf.res'.		
13. Implemented By: Ron Jones		Date: 1-14-98



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-219		
02. Project Title: TPA Code Testby		20-5708-7622 Project Number:
03. SPCR Title: Modify Strmube.dat for 2 near field units/STF and STAC)		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Strmube.dat tpa.inp		
05. DESCRIPTION OF PROBLEM/CHANGE		
Strmube.dat had many (8 to 10) different units for the near field streamtubes A-D - these units were computed into 1 unit (having TSw unit properties) and the values for STF P (the new unit) replaced parameters in tpa.inp		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify Strmube.dat & tpa.inp		
07. Originator: G. Wittmeyer	Title: Sr. Res. Sci	Date: 1/9/98
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 1/9/98	
11. Element Manager: RG Bueco	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above		
13. Implemented By: Robert L. King		Date: 1/9/98

here changed to have TSw values

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-218								
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:						
03. SPCR Title: Allow for Fraction of Mass Captured @ 5 Km								
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION								
<table border="0"> <tr> <td>tpa.names.dbs</td> <td>tpa.inp</td> </tr> <tr> <td>dcagw.f</td> <td>dilution.dat</td> </tr> <tr> <td>exec.f</td> <td></td> </tr> </table>			tpa.names.dbs	tpa.inp	dcagw.f	dilution.dat	exec.f	
tpa.names.dbs	tpa.inp							
dcagw.f	dilution.dat							
exec.f								
05. DESCRIPTION OF PROBLEM/CHANGE								
<p>TPA code calculations were made assuming 100% of redissolutes are captured by pumping - this assumption was relaxed &amp; the fraction mass captured by pumping was added to the TPA code. (algorithm by R. Pedron)</p>								
06. PROBLEM SOLUTION/NEED FOR CHANGE								
<p>Modify code (dcagw.f) to read input data file (dilution.dat) and to determine fraction mass captured - also add new parameter (aquifer thickness @ 5km) to tpa.inp and to tpa.names.dbs (writing fraction mass captured from exec.f to dcagw.rtf)</p>								
07. Originator: G. Wittmeyer	Title: Sr. Res. Sci	Date: 1/9/98						
PROJECT								
08. Need by Date: 1/15/98	09. Approved:	Disapproved:						
10. Software Developer: S. Mohanty et al.	Date: 1/9/98							
11. Element Manager: [Signature]	Date:							
12. IMPLEMENTED SOLUTION								
Implemented as described in section 01								
13. Implemented By: [Signature]		Date: 1/9/98						

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-217		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: CCDF Handler for totdose.res		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tccdf.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>The tccdf.f code produces a ccdf of the last dose rate in the totdose.res file. It is desired to use the total dose accumulated over all time for the ccdf. Also the last point in the ccdf curve can have a value of zero.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>A trapezoidal integration routine should be used to provide total dose values for the ccdf algorithm. The ccdf algorithm should be adjusted to eliminate zeroes from the last probability value.</p>		
07. Originator: Jawetzke	Title: Analyst	Date: 12-18-97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.		Date: 12/18/97
11. Element Manager: RG Boero		Date:
12. IMPLEMENTED SOLUTION		
Implemented as described in section 6 above.		
13. Implemented By: Ron Jawetzke		Date: 1-8-98

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-216		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: Matrix Diffusion		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
SEFT.F, tpa.inp, tparameters.dbs, strm tube.dat		
05. DESCRIPTION OF PROBLEM/CHANGE		
The <u>SEFT</u> module cannot perform a matrix diffusion run with <u>netmks</u> .		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The netmks input file generated by SEFT should contain the matrix diffusion flag enabled, as well as values for immobile porosity, diffusion rate and immobile RPs.		
07. Originator: J. McCartin	Title: NRC	Date: 12-16-97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 12/16/97	
11. Element Manager: RG Trace	Date:	
12. IMPLEMENTED SOLUTION		
SEFT.F was changed to handle the new input parameters and place them in the netmks input file.		
13. Implemented By: R. Jones		Date: 12-23-97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-215		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Modified Release Argument List with single precision numbers		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
release.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
2 calls to "decay" in release.f use "1000.D0" which is read as 3.14 instead of 1000.0 (this is a compiler error)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Use a dummy variable to <del>release</del> replace 1000.D0 for these two instances		
07. Originator: Rob Rice	Title: Consultant	Date: 12/19/97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 12/15/97	
11. Element Manager: PG Bae	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rice		Date: 14/19/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-214		
02. Project Title: TPA Code Testing		20-5-208-7622 Project Number:
03. SPCR Title: Zero out C14 from Ground Water Release		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
uzft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
When NEFTAN was skipped, C14 was not zeroed out (which occurs if NEFTAN runs)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
When NEFTAN is skipped, we 'goto' to send execution of the code to where C14 is zeroed out when NEFTAN runs.		
07. Originator: Rob Rice	Title: Consultant	Date: 12/15/97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 12/15/97	
11. Element Manager: RG Boice	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in sect. 06		
13. Implemented By: R. Rice		Date: 12/19/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-213		
02. Project Title: TPA Code Testing		20-5708-7622 Project Number:
03. SPCR Title: Increase Array Dimensions for Reading NEFTRAN disc		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
u2fft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Array dimensions for the # of time steps in the NEFTRAN output file exceeded the max. # in u2fft.f(2000)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Increase maxnumdis from 2000 to 9999		
07. Originator: R. Janetze	Title: Analyst	Date: 10/10/97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty	Date: 12/10/97	
11. Element Manager: R. G. Buea	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above.		
13. Implemented By: R. Ricci		Date: 12/19/97

large file

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-212		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: VZFT NSTEP out of Range		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
VZft.f.		
05. DESCRIPTION OF PROBLEM/CHANGE		
The reference to The SAT array when filling the SATM and SATF arrays is subject to go out of bounds due to a potential infinite loop.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
I impose a limit check on the loop that sets NSTEP and print an error message if the limit is exceeded.		
07. Originator: Janetzke	Title: Analyst	Date: 10-6-97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 12/19/97	
11. Element Manager: [Signature]	Date:	
12. IMPLEMENTED SOLUTION		
Limit check was inserted, as well as ensuring that The C14 array is zeroed for all cases when VZFT is SKIPPED.		
13. Implemented By: [Signature]	Date: 12-19-97	



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-211		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: Release Set Double Precision Index		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
release set. f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Double Precision variable marker is used as an array index. This will cause incorrect addressing if the array size exceeds $2^{24}$ bits. Also, diff1ux2 at line 2175 appears to be calculated incorrectly.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Change marker to an Integer variable. Use $\text{diff1ux2} = \text{CON4} * (\text{cp}(\text{marker} - 1) - \text{cp}(\text{marker}))$ at line 2175.		
07. Originator: R. Odell	Title:	Date: 10-6-97
PROJECT		
08. Need by Date: 1/15/98	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 10/6/97	
11. Element Manager: R. Bae	Date:	
12. IMPLEMENTED SOLUTION		
Equation for CON4 was changed similarly to the change for 'diff1ux2'. These changes were initially performed in ~/tpa/ideas, and then transferred to ~/tpa/dev.		
13. Implemented By: R. Jonathas		Date: 12-18-97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-210		
02. Project Title: TPA3 Code Testing		Project Number: 762
03. SPCR Title: Read NEFTRAN discharge File		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
uzft.f, szft.f, nefmks.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Subroutine Aftnefmks reads the NEFTRAN output file to retrieve discharge rates. For single precision runs the end time is occasionally missing, which causes the program to crash.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Rewrite Aftnefmks to read the NEFTRAN discharge file.		
07. Originator: T. McCartin	Title: Analyst	Date: 10-6-97
PROJECT		
08. Need by Date: 10/6/98	09. Approved:	Disapproved:
10. Software Developer: JaneTzke	Date: 12-18-97	
11. Element Manager: [Signature]	Date:	
12. IMPLEMENTED SOLUTION		
The discharge file usage was enabled for all 3 affected software modules. Plus the file name array for chain information was increased in NEFMKS.F.		
13. Implemented By: [Signature]		Date: 12-18-97

These changes were initially performed in u/tpa/ideas.

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPQR Number: PA-SPQR-209	
02. Project Title: TPA3 code testing	Project Number: 762
03. SPQR Title: single realization runs	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION Execif, Tra.inp, tparames. db5	
05. DESCRIPTION OF PROBLEM/CHANGE The TPA code cannot complete normally without running the complete complement of subareas and realization.	
06. PROBLEM SOLUTION/NEED FOR CHANGE Introduce new parameters in the tpa.inp file to permit the execution of a single realization on a single subarea from a larger set.	
07. Originator: Janezke Title: Analyst Date: 10-6-97	
PROJECT	
08. Need by Date: 1/15/98	09. Approved:
Disapproved:	
10. Software Developer: S. Mohanty et. al.	Date: 12/18/97
11. Element Manager: [Signature]	Date:
12. IMPLEMENTED SOLUTION	
Parameters start AT Realization, stop AT Realization, start AT subarea, stop AT subarea, were introduced to tpa.inp. Execif was changed to handle the new parameters.	
13. Implemented By: [Signature]	Date: 12-18-97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR- <del>XXX</del> 208		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Change of Inhalation Dose Conversion Model in DCAGS.F from a Resuspension Factor Model to a Model that uses the Mass Load.		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. dcags.f 2. TPA 3.1.2		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>Since the resuspension factor is an empirical factor and is difficult to relate to anything physical, a mass load model, where the mass of soil (ash) per unit volume of air is implemented in the new version of DCAGS.F. The mass load of airborne soil (ash) is now used as input. Calculating an airborne radionuclide concentration is done by dividing the cipermtatCP(i) (from ashrmovo) by gramsashpercm2*1.d+04 (from ashplumo) and then multiplying by the mass load (input). This quantity is multiplied by another factor to account for thin blankets being totally resuspended over the course of one year (see section 12 below). This approach does not account for any variances due to particle size distribution of the resuspended matter being different than the particle size distribution of the soil (ash) from which it was resuspended.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>This change is being made at the request of NRC/CNWRA staff. It is not made to correct an error in the current code, i.e. The current module is functioning as intended with a resuspension factor model being used for dose conversion.</p>		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 12/12/97
PROJECT		
08. Need by Date: <del>6/1/97</del> 1/15/97		09. Approved: Disapproved:
10. Software Developer: S. Mohanty et al.		Date: 12/12/97
11. Element Manager: RG Boore		Date:
12. IMPLEMENTED SOLUTION		
<p>Attached to this SPCR are the following; (i) a copy of the previous version of dcags.f which uses the resuspension factor model, and (ii) a copy of the new version of dcags.f. Along with the mass load now being an input parameter, another input parameter entitled 'DepthofResuspendableLayer[cm]' is required. This parameter allows the code to calculate a fraction of resuspended mass that comes from the contaminated volcanic ash layer over the course of one year for blankets that are thinner than this depth. For example, as ASHPLUME is implemented in the current version of TPA, blankets as thick as about 1.d-10 cm can be calculated and passed on the rest of the code. It would be overconservative to assume that all of the resuspended mass is from such thin contaminated layers.</p>		
13. Implemented By: Mark Jarzempa		Date: 12-12-97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-207		
02. Project Title: TPA Code		20-5-208-7622 Project Number:
03. SPCR Title: Modified tpnames.dbs to include only sampled parameters (not iflag names)		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tpnames.dbs (in data subdirectory)		
05. DESCRIPTION OF PROBLEM/CHANGE		
the data have file tpnames.dbs included sampled parameter names & iflag names this could cause the tpa code to stop execution		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
remove the 5 lines w/ iflag names		
07. Originator: R. Rice	Title: Consultant	Date: 10/10/92
PROJECT		
08. Need by Date: 10/10/92	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 10/10/92	
11. Element Manager: RB Bae	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rice		Date: 10/10/92

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-206		
02. Project Title: TPA Code		20-5-208-7822 Project Number:
03. SPCR Title: Modify tparameters.db5 file to match tpa.inp parameters names		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tparameters.db5 (in data subdirectory)		
05. DESCRIPTION OF PROBLEM/CHANGE		
names of tpa.inp parameter were changed and the names in the database file for tpa parameters names (tparameters.db5) did not match those names.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
modify names in the database file, tparameters.db5, to match tpa.inp parameters names for the change of "NfHydraz" to "Reflex2"		
07. Originator: S. Mohanty	Title: Analyst.	Date: 10/9/97
PROJECT		
08. Need by Date: 10/9/97	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 10/9/97	
11. Element Manager: RB/Boone	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above (see attached sheet)		
13. Implemented By: TR. Rfo		Date: 10/9/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>AA-SPCR-205</b>	
02. Project Title: <b>TPA3.1</b>	20-5708-762 Project Number:
03. SPCR Title: <b>Reduced Execution Memory Size</b>	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
nefmks.f, maxnsuba.i (used in ebsfail.f, ebsrel.f, execf, reader.f, subareort, uzft.f), Makefile for nefmks.f.	
05. DESCRIPTION OF PROBLEM/CHANGE	
nefmks.e is 59,091,622 bytes + exec.e is about 50 M bytes. Together they require over 100 M bytes of memory for each user running the code. When multiple users are running on the same machine insufficient memory may prevent users from executing the code.	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
<u>nefmks.f</u> Change all REAL*8 variables to REAL and compile without the -r8 option. This will give a size of 29,523,772. <u>maxnsuba.i</u> Change parameter maxnsubarea to 30 instead of 100. This will give a size of 17,925,146.	
07. Originator: <b>R. Codell</b>	Title: <b>NRC</b>
Date: <b>9-23-97</b>	
PROJECT	
08. Need by Date:	09. Approved: <b>[Signature]</b>
Disapproved: <b>(10/1/97)</b>	
10. Software Developer: <b>Janetzke</b>	Date: <b>9-30-97</b>
11. Element Manager: <b>S. Mohanty</b> <b>R. Baca</b>	Date: <b>10/1/97</b>
12. IMPLEMENTED SOLUTION	
nefmks.f was replaced with nefmksf.f received via e-mail from S. Mohanty. maxnsuba.i was edited as shown above in section 6. Some nefmks results are different in the last digit, but are	
13. Implemented By: <b>Ron Janetzke</b>	Date: <b>9-30-97</b>

satisfactory  
to NRC.  
(R. Codell)

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**cc:Mail for: Sitakanta Mohanty**

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**Subject:** proposed revisions to tpa 3.1  
**From:** UD1.UP1:RBC at PSEUDO 1997/09/24 3:56 PM  
**To:** Sitakanta Mohanty (SMOHANTY) at CNWRA  
**cc:** TWD2.TWP7:kim at PSEUDO  
**cc:** TWD2.TWP7:tjm3 at PSEUDO

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Date: 09/24/1997 03:56 pm (Wednesday)  
From: Richard Codell  
To: SWRI.CNWRA-OS2.SMOHANTY  
CC: tjm3,kim  
Subject: proposed revisions to tpa 3.1

As we discussed, here are two proposed revisions to tpa 3.1 to improve the efficiency by reducing the memory requirements substantially. The first is a single-precision version of nefmks.f, which I call nefmkss.f. It must also be compiled without the -r8 switch in the makefile. The second change is change the include file maxnsuba.i to reduce the parameter maxnsubarea from 100 to something more reasonable like 7. These two changes should reduce the memory requirements by approximately half, greatly facilitating the ability to run on our Sun workstations. There are a number of other memory savings that could be justified, such as reducing the use of double precision arrays except where we need the accuracy, and reducing the size of the arrays to something more like the maximum we expect to run. I believe we can trim another 50% with little trouble.

Dick



```
138c138
< REAL*8 LAMBDA, C, AW, P
---
> REAL LAMBDA, C, AW, P
142c142
< REAL*8 PEAK(MXISO), TIMBRK(MXISO), TIMPK(MXISO), TOTD(MXISO),
---
> REAL PEAK(MXISO), TIMBRK(MXISO), TIMPK(MXISO), TOTD(MXISO),
147c147
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
152c152
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
162c162
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
169c169
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
337c337
< REAL*8 LAMBDA, C, AW, P
---
> REAL LAMBDA, C, AW, P
349c349
< REAL*8 PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
---
> REAL PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
354c354
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
362c362
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
372c372
< REAL*8 TH(MXLEG), Q(MXLEG), PATH(MXLEG)
---
> REAL TH(MXLEG), Q(MXLEG), PATH(MXLEG)
376c376
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
383c383
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
387c387
< REAL*8 TSRCE(MXQSC), QSRCE(MXQSC)
---
> REAL TSRCE(MXQSC), QSRCE(MXQSC)
393c393
< REAL*8 QSC, VOL
---
> REAL QSC, VOL
397c397
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
401c401
```

```

<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
406c406
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
1049,1050c1049,1050
<      REAL*8 MKSDX, MKSDXX, LAMBDA, TDNM
<      REAL*8 C0, C1, C2, D1, D2, D3, V1, V2, V3, DRPJ, CN, FMRPJ,
---
>      REAL MKSDX, MKSDXX, LAMBDA, TDNM
>      REAL C0, C1, C2, D1, D2, D3, V1, V2, V3, DRPJ, CN, FMRPJ,
1054c1054
<      REAL*8 TH(MXLEG), Q(MXLEG), PATH(MXLEG)
---
>      REAL TH(MXLEG), Q(MXLEG), PATH(MXLEG)
1061c1061
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
1069c1069
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
1076c1076
<      REAL*8 VOL, QSC
---
>      REAL VOL, QSC
1080c1080
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
1085c1085
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
1092c1092
<      REAL*8 GA(MXNVI), R, SIGIR, TNUM, VL(MXMEM,MXNVI)
---
>      REAL GA(MXNVI), R, SIGIR, TNUM, VL(MXMEM,MXNVI)
1458,1459c1458,1459
<      REAL*8 LAMBDA
<      REAL*8 DL, DM, TSI, DFR, DLIN, DR, DTIN, DSTSAV, SUM,
---
>      REAL LAMBDA
>      REAL DL, DM, TSI, DFR, DLIN, DR, DTIN, DSTSAV, SUM,
1462c1462
<      REAL*8 ABFX
---
>      REAL ABFX
1465c1465
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
1473c1473
<      REAL*8 TH(MXLEG), PATH(MXLEG), Q(MXLEG)
---
>      REAL TH(MXLEG), PATH(MXLEG), Q(MXLEG)
1477c1477
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
1484c1484
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)

```

```

---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
1489c1489
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
1496c1496
< REAL*8 TS(MXMEM), VL(MXMEM,MXNVI), VA(MXMEM,MXNVI),
---
> REAL TS(MXMEM), VL(MXMEM,MXNVI), VA(MXMEM,MXNVI),
1920,1921c1920,1921
< REAL*8 DIS, DSMX, DTEF, DKR, DXLG, DTE, FKR, FKR1, PV
< REAL*8 TS(MXMEM), VA(MXMEM,MXNVI), WF
---
> REAL DIS, DSMX, DTEF, DKR, DXLG, DTE, FKR, FKR1, PV
> REAL TS(MXMEM), VA(MXMEM,MXNVI), WF
1923c1923
< REAL*8 ABFX
---
> REAL ABFX
1926c1926
< REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
1931c1931
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
2055,2057c2055,2057
< REAL*8 LAMBDA
< REAL*8 RMNT, T1, T2, AA, AY, FMNT, DT1, DT2, DT3, DT4, RNT
< REAL*8 DTSIG, DEPLEN, TM, FCTR, FNT, SIGT, CM
---
> REAL LAMBDA
> REAL RMNT, T1, T2, AA, AY, FMNT, DT1, DT2, DT3, DT4, RNT
> REAL DTSIG, DEPLEN, TM, FCTR, FNT, SIGT, CM
2060,2061c2060,2061
< cc REAL*8 DXK(MXMEM), DTMIN, DTX, CNX, VDT(MXPTH)
< REAL*8 DXK(MXPTH), DTMIN, DTX, CNX, VDT(MXPTH)
---
> cc REAL DXK(MXMEM), DTMIN, DTX, CNX, VDT(MXPTH)
> REAL DXK(MXPTH), DTMIN, DTX, CNX, VDT(MXPTH)
2065c2065
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
2073c2073
< REAL*8 TH(MXLEG), PATH(MXLEG), Q(MXLEG)
---
> REAL TH(MXLEG), PATH(MXLEG), Q(MXLEG)
2077c2077
< REAL*8 Y, DT, PORE(MXPTH)
---
> REAL Y, DT, PORE(MXPTH)
2084c2084
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM),
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM),
2089c2089
< REAL*8 VOL, QSC
---
> REAL VOL, QSC
2093c2093
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---

```

```

>      REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
2097c2097
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
2102c2102
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
2615,2616c2615,2616
<      REAL*8 LAMBDA
<      REAL*8 V1, VDT, VDTK, DT, Y
---
>      REAL LAMBDA
>      REAL V1, VDT, VDTK, DT, Y
2619c2619
<      REAL*8 TH(MXLEG), Q(MXLEG), PATH(MXLEG)
---
>      REAL TH(MXLEG), Q(MXLEG), PATH(MXLEG)
2623c2623
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
2631c2631
<      REAL*8 PORE(MXPTH)
---
>      REAL PORE(MXPTH)
2662,2663c2662,2663
<      REAL*8 LAMBDA, D, EX1, EX2, TDNX
<      REAL*8 FCTR, SUM, ANS, SFMX, CTF, XM, VR, VP, DT, BMN,
---
>      REAL LAMBDA, D, EX1, EX2, TDNX
>      REAL FCTR, SUM, ANS, SFMX, CTF, XM, VR, VP, DT, BMN,
2667c2667
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
2675c2675
<      REAL*8 PORE(MXPTH)
---
>      REAL PORE(MXPTH)
2682c2682
<      REAL*8 F(NDDF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
---
>      REAL F(NDDF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
2686c2686
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
3059,3062c3059,3062
<      REAL*8 B1, B2, T1, T2, DT, S1, S2
<      REAL*8 D(*),E1,E2,DN1,DN2,R1,R2,SUM,P
<      REAL*8 T11,T12,T21,T22,T11T,T12T,T21T,T22T
<      REAL*8 ANS, CJ, D1, D2
---
>      REAL B1, B2, T1, T2, DT, S1, S2
>      REAL D(*),E1,E2,DN1,DN2,R1,R2,SUM,P
>      REAL T11,T12,T21,T22,T11T,T12T,T21T,T22T
>      REAL ANS, CJ, D1, D2
3119c3119
<      REAL*8 FUNCTION PRP(D,B,V,VP,DL,N,T1,T2)
---
>      REAL FUNCTION PRP(D,B,V,VP,DL,N,T1,T2)
3123,3124c3123,3124
<      REAL*8 D(*),F1,F2,DENOM,DF,P1,P2,P3,X

```

```

<      REAL*8 PROD, ZZ, T1, T2, B(*), V, VP, DL
---
>      REAL D(*), F1, F2, DENOM, DF, P1, P2, P3, X
>      REAL PROD, ZZ, T1, T2, B(*), V, VP, DL
3162c3163
<      REAL*8 LAMBDA, DSV
<      REAL*8 DTLT, DTLT2, DTSM, SUM, TDP
---
>      REAL LAMBDA, DSV
>      REAL DTLT, DTLT2, DTSM, SUM, TDP
3165c3165
<      REAL*8 TSPFAC
---
>      REAL TSPFAC
3167c3167
<      REAL*8 CUREOUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUREOUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
3175c3175
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
3182c3182
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
3187c3187
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
3194c3194
<      REAL*8 BFR(MXMEM), D(MXMEM), DS(MXMEM)
---
>      REAL BFR(MXMEM), D(MXMEM), DS(MXMEM)
3311c3311
<      REAL*8 FUNCTION TSPFAC(DT,D,B,LT,TDP)
---
>      REAL FUNCTION TSPFAC(DT,D,B,LT,TDP)
3322c3324
<      REAL*8 D(*),DC(5),DN(9),A,SUM,SUM1,PM,P
<      REAL*8 F2,DCL,R12,R23,R24,R35, TDP
<      REAL*8 SUMS, DT, B(*)
---
>      REAL D(*),DC(5),DN(9),A,SUM,SUM1,PM,P
>      REAL F2,DCL,R12,R23,R24,R35, TDP
>      REAL SUMS, DT, B(*)
3429c3429
<      REAL*8 C, AW, P
---
>      REAL C, AW, P
3431c3431
<      REAL*8 BCJ(MXJCT)
---
>      REAL BCJ(MXJCT)
3438c3438
<      REAL*8 PATH(MXLEG), Q(MXLEG), TH(MXLEG)
---
>      REAL PATH(MXLEG), Q(MXLEG), TH(MXLEG)
3442c3442
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
3656c3656
<      REAL*8 C, AW, AM, SUM
---
```

```
> REAL C, AW, AM, SUM
3658c3658
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
3730,3732c3730,3732
< REAL*8 MKSP, MKSQ, MKSPOR, MKSQSC, MKSQDI, MKSY, PDIS, TT,
1 MKSPDI
< REAL*8 C, AW, P, PDF
---
> REAL MKSP, MKSQ, MKSPOR, MKSQSC, MKSQDI, MKSY, PDIS, TT,
1 MKSPDI
> REAL C, AW, P, PDF
3734c3734
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
3741c3741
< REAL*8 PATH(MXLEG), Q(MXLEG), TH(MXLEG)
---
> REAL PATH(MXLEG), Q(MXLEG), TH(MXLEG)
3745c3745
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
3752c3752
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
3756c3756
< REAL*8 VOL, QSC
---
> REAL VOL, QSC
3760c3760
< REAL*8 TDTM(MXTDV), TDSAT(MXTDV,MXPTH), TDVEL(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDSAT(MXTDV,MXPTH), TDVEL(MXTDV,MXPTH),
3951c3951
< REAL*8 C, AW
---
> REAL C, AW
3955c3955
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
3960c3960
< REAL*8 TH(MXLEG), PATH(MXLEG), Q(MXLEG)
---
> REAL TH(MXLEG), PATH(MXLEG), Q(MXLEG)
3964c3964
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
4017c4017
< REAL*8 T1, T2, DT, TUP, Y, DLG, DLT, DIS, DISI, PDIS,
---
> REAL T1, T2, DT, TUP, Y, DLG, DLT, DIS, DISI, PDIS,
4020c4020
< REAL*8 PATH(MXLEG), Q(MXLEG), TH(MXLEG)
---
> REAL PATH(MXLEG), Q(MXLEG), TH(MXLEG)
4024c4024
< REAL*8 PORE(MXPTH)
---
> REAL PORE(MXPTH)
```

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4031c4031
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
4038c4038
< REAL*8 TDTM(MXTDV), TDSAT(MXTDV,MXPTH), TDVEL(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDSAT(MXTDV,MXPTH), TDVEL(MXTDV,MXPTH),
4115,4117c4115,4117
< REAL*8 DFF, EA, SUM, FMAX, T1, T2, TME, BLKS, TM1BLK
< REAL*8 TTRL, T3, DL, VR, VRP, TMAX, D(MXMEM), BFR(MXMEM)
< REAL*8 FM, TLED, TMIN, LAMBDA, DF1, RATF1
---
> REAL DFF, EA, SUM, FMAX, T1, T2, TME, BLKS, TM1BLK
> REAL TTRL, T3, DL, VR, VRP, TMAX, D(MXMEM), BFR(MXMEM)
> REAL FM, TLED, TMIN, LAMBDA, DF1, RATF1
4119c4119
< REAL*8 ET, PRP
---
> REAL ET, PRP
4121c4121
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
4129c4129
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
4136c4136
< REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
4141c4141
< REAL*8 F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
---
> REAL F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
4145c4145
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
4173,4176c4173,4175
< c rwj 9/18/97 Add line to prevent 0 subscript in RHO array for last member
< c in a chain of 3 or more.
< IF (L .GT. NTX) L = NTX
< c
---
> crbc92297
> if(l.gt.ntx) l=ntx
> crbc
4391,4392c4390,4391
< REAL*8 MKSPTH, MKSARE, MKSCON
< REAL*8 LAMBDA, C, AW, P
---
> REAL MKSPTH, MKSARE, MKSCON
> REAL LAMBDA, C, AW, P
4394c4393
< REAL*8 TIMBRK(MXISO), TIMPK(MXISO), PEAK(MXISO), WDIS(MXISO),
---
> REAL TIMBRK(MXISO), TIMPK(MXISO), PEAK(MXISO), WDIS(MXISO),
4399c4398
< REAL*8 BCJ(MXJCT)
---
> REAL BCJ(MXJCT)
4404c4403
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),

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```
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
4414c4413
< REAL*8 TH(MXLEG), PATH(MXLEG), Q(MXLEG)
---
> REAL TH(MXLEG), PATH(MXLEG), Q(MXLEG)
4418c4417
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
4425c4424
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
4429c4428
< REAL*8 TSRCE(MXQSC), QSRCE(MXQSC)
---
> REAL TSRCE(MXQSC), QSRCE(MXQSC)
4435c4434
< REAL*8 VOL, QSC
---
> REAL VOL, QSC
4439c4438
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
4443c4442
< REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
5311,5312c5310,5311
< REAL*8 LAMBDA, DTSAVE, PRF
< REAL*8 SOLG, FLCH, T, TDT, SUMA, SUMC, SUMU, TRAT, TW, TOTG,
---
> REAL LAMBDA, DTSAVE, PRF
> REAL SOLG, FLCH, T, TDT, SUMA, SUMC, SUMU, TRAT, TW, TOTG,
5320c5319
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
5328c5327
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
5335c5334
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
5339c5338
< REAL*8 TSRCE(MXQSC), QSRCE(MXQSC)
---
> REAL TSRCE(MXQSC), QSRCE(MXQSC)
5342c5341
< REAL*8 VOL, QSC
---
> REAL VOL, QSC
5346c5345
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
5353c5352
< REAL*8 UNT(MXISO), AT(MXISO), PF(MXSUB,MXCHNS)
---
> REAL UNT(MXISO), AT(MXISO), PF(MXSUB,MXCHNS)
5775c5774
```



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<      REAL*8 LAMBDA, T1, T2, TT, PDIS
---
>      REAL LAMBDA, T1, T2, TT, PDIS
5780c5779
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
5788c5787
<      REAL*8 Q(MXLEG), PATH(MXLEG), TH(MXLEG)
---
>      REAL Q(MXLEG), PATH(MXLEG), TH(MXLEG)
5792c5791
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
5799c5798
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
5806c5805
<      REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
>      REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
5810c5809
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
5815c5814
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
5822c5821
<      REAL*8 VDT(MXPTH), DXSV(MXPTH), VDTSV(MXPTH)
---
>      REAL VDT(MXPTH), DXSV(MXPTH), VDTSV(MXPTH)
6047c6046
<      REAL*8 LAMBDA, ET
---
>      REAL LAMBDA, ET
6049c6048
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
6057c6056
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
6062c6061
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
6077,6078c6076,6077
<      REAL*8 RM(MXMEM), DMIN, RMX, BFR(MXMEM)
<      REAL*8 D(MXMEM)
---
>      REAL RM(MXMEM), DMIN, RMX, BFR(MXMEM)
>      REAL D(MXMEM)
6282c6281
<      REAL*8 FUNCTION ET(T,IP,D,B)
---
>      REAL FUNCTION ET(T,IP,D,B)
6284,6285c6283,6284
<      REAL*8 D(*), DC(5), DN(5)
<      REAL*8 PROD, PM, F2, A, SUM, SUM1, T, B(*)
---

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```

>      REAL D(*), DC(5), DN(5)
>      REAL PROD, PM, F2, A, SUM, SUM1, T, B(*)
6387,6388c6386,6387
<      REAL*8 TIME, DJ, DI, RAT
<      REAL*8 T,A1,A2,ARG1,ARG2,A,ARG,ELF,ADD,S,TS,TSS
---
>      REAL TIME, DJ, DI, RAT
>      REAL T,A1,A2,ARG1,ARG2,A,ARG,ELF,ADD,S,TS,TSS
6491c6490
<      REAL*8 RESIDE, DT1, DT2, DT3, DT4, DTH, TTMIN, QSKQ, QMAX,
---
>      REAL RESIDE, DT1, DT2, DT3, DT4, DTH, TTMIN, QSKQ, QMAX,
6493c6492
<      REAL*8 LAMBDA, D, PROD, DEC
---
>      REAL LAMBDA, D, PROD, DEC
6495c6494
<      REAL*8 ET
---
>      REAL ET
6497c6496
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
6505c6504
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
6512c6511
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
6516c6515
<      REAL*8 TSRCE(MXQSC), QSRCE(MXQSC)
---
>      REAL TSRCE(MXQSC), QSRCE(MXQSC)
6519c6518
<      REAL*8 QSC, VOL
---
>      REAL QSC, VOL
6523c6522
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
6530c6529
<      REAL*8 BFR(MXISO), AT(MXISO), PF(MXSUB,MXCHNS)
---
>      REAL BFR(MXISO), AT(MXISO), PF(MXSUB,MXCHNS)
6774c6773
<      REAL*8 QSC, QDIS, VOL, T1, T2, F, F1, TSTOP, ARG
---
>      REAL QSC, QDIS, VOL, T1, T2, F, F1, TSTOP, ARG
6776c6775
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM)
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM)
6825c6824
<      REAL*8 LAMBDA
---
>      REAL LAMBDA
6838c6837
<      REAL*8 TS, T1, TRAT, DELT, T
---
>      REAL TS, T1, TRAT, DELT, T
6842c6841

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```

<      REAL*8 PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
---
>      REAL PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
6850c6849
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
6860c6859
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
6865c6864
<      REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
>      REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
6870c6869
<      REAL*8 TSCL(NTMX), RATE(MXISO), RATEL(MXISO), RATER(MXISO),
---
>      REAL TSCL(NTMX), RATE(MXISO), RATEL(MXISO), RATER(MXISO),
7191c7190
<      REAL*8 X(*), A
---
>      REAL X(*), A
7218c7217
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
7260c7259
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
7265c7264
<      REAL*8 QSC, VOL
---
>      REAL QSC, VOL
7395,7397c7394,7396
<      REAL*8 LAMBDA, C, AW, P
<      REAL*8 MKSQSA, MKSSAL, MKSQDA, MKSARE, MKSALP, MKSDX, MKSP
<      REAL*8 MKSCON, MKSPOR, MKSEL, MKSTDV, MKSVOL, MKSPTH, MKSQSR
---
>      REAL LAMBDA, C, AW, P
>      REAL MKSQSA, MKSSAL, MKSQDA, MKSARE, MKSALP, MKSDX, MKSP
>      REAL MKSCON, MKSPOR, MKSEL, MKSTDV, MKSVOL, MKSPTH, MKSQSR
7399,7400c7398,7399
<      REAL*8 PEAK(MXISO), TIMBRK(MXISO), TIMPK(MXISO), TOTD(MXISO)
<      REAL*8 WDIS(MXISO), WDISUM
---
>      REAL PEAK(MXISO), TIMBRK(MXISO), TIMPK(MXISO), TOTD(MXISO)
>      REAL WDIS(MXISO), WDISUM
7404c7403
<      REAL*8 BCJ(MXJCT)
---
>      REAL BCJ(MXJCT)
7412c7411
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
7422c7421
<      REAL*8 TH(MXLEG), Q(MXLEG), PATH(MXLEG)
---
>      REAL TH(MXLEG), Q(MXLEG), PATH(MXLEG)
7426c7425
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y

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```
7433c7432
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
7437c7436
< REAL*8 TSRCE(MXQSC), QSRCE(MXQSC)
---
> REAL TSRCE(MXQSC), QSRCE(MXQSC)
7443c7442
< REAL*8 QSC, VOL
---
> REAL QSC, VOL
7447c7446
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
7451c7450
< REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
7456c7455
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
7774,7775c7773,7774
< REAL*8 CHK, TM, T, SIGT, TL, VV, TSTART, TEND, T1, T2, TSUM
< REAL*8 LAMBDA
---
> REAL CHK, TM, T, SIGT, TL, VV, TSTART, TEND, T1, T2, TSUM
> REAL LAMBDA
7777c7776
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
7785c7784
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
7792c7791
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
7799c7798
< REAL*8 QSC, VOL
---
> REAL QSC, VOL
7803c7802
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
7807c7806
< REAL*8 F(NDDF), RHOM(MXGRD,MXMEM), RHONEW(MXGRD), SF(NDSF),
---
> REAL F(NDDF), RHOM(MXGRD,MXMEM), RHONEW(MXGRD), SF(NDSF),
7818,7821c7817,7820
< REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
< REAL*8 dr2tim(maxrec), dr2vol(maxrec)
< REAL*8 filcur(mxiso,maxrec), filtim(maxrec)
< REAL*8 filvol(maxrec), tarr(maxtim), totvol(maxtim)
---
> REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
> REAL dr2tim(maxrec), dr2vol(maxrec)
> REAL filcur(mxiso,maxrec), filtim(maxrec)
> REAL filvol(maxrec), tarr(maxtim), totvol(maxtim)
7984,7985c7983,7984
```

```

<      REAL*8 LAMBDA, RAT12, RAT23, RAT13, GIT
<      REAL*8 E1, E2, E3, B, C, GPART, A, V, T, TL, TSET,
---
>      REAL LAMBDA, RAT12, RAT23, RAT13, GIT
>      REAL E1, E2, E3, B, C, GPART, A, V, T, TL, TSET,
7994c7993
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
8002c8001
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
8009c8008
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
8013c8012
<      REAL*8 QSC, VOL
---
>      REAL QSC, VOL
8083c8082
<      REAL*8 FUNCTION GIT(T,X,V,AL)
---
>      REAL FUNCTION GIT(T,X,V,AL)
8085,8086c8084,8085
<      REAL*8 A(5), P, TRPI, T, X, V, AL, ANS, B, Z
<      REAL*8 PLYET1, PLYET2, ET1, ET2, ZMB, TERM1, TERM2, XX, XXEX
---
>      REAL A(5), P, TRPI, T, X, V, AL, ANS, B, Z
>      REAL PLYET1, PLYET2, ET1, ET2, ZMB, TERM1, TERM2, XX, XXEX
8145c8144
<      REAL*8 T, MKSQDI, DT2, DTFP , LAMBDA, TM, TSET
---
>      REAL T, MKSQDI, DT2, DTFP , LAMBDA, TM, TSET
8147,8150c8146,8149
<      REAL*8 totvol(maxtim)
<      REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
<      REAL*8 dr2tim(maxrec), dr2vol(maxrec), filtim(maxrec)
<      REAL*8 filcur(mxiso,maxrec), filvol(maxrec), tarr(maxtim)
---
>      REAL totvol(maxtim)
>      REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
>      REAL dr2tim(maxrec), dr2vol(maxrec), filtim(maxrec)
>      REAL filcur(mxiso,maxrec), filvol(maxrec), tarr(maxtim)
8154c8153
<      REAL*8 PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
---
>      REAL PEAK(MXISO), TOTD(MXISO), WDIS(MXISO), WDISUM,
8159c8158
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
8167c8166
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
8174c8173
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
8279,8280c8278,8279
<      REAL*8 LAMBDA, T, SUM, SUM1, SUM2, SUM3, SUM4, SUM5, SUM6
<      REAL*8 TX1, TATM, TX2, SR1, SR2, TS1, TS2, S24, TSET, BM
---
```

```
> REAL LAMBDA, T, SUM, SUM1, SUM2, SUM3, SUM4, SUM5, SUM6
> REAL TX1, TATM, TX2, SR1, SR2, TS1, TS2, S24, TSET, BM
8282c8281
< REAL*8 ABFX
---
> REAL ABFX
8288c8287
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
8296c8295
< REAL*8 PORE(MXPTH), DT, Y
---
> REAL PORE(MXPTH), DT, Y
8303c8302
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
8307c8306
< REAL*8 QSC, VOL
---
> REAL QSC, VOL
8311c8310
< REAL*8 TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
---
> REAL TDTM(MXTDV), TDDT(MXTDV), TDSAT(MXTDV,MXPTH),
8315c8314
< REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
> REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
8320c8319
< REAL*8 F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
---
> REAL F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
8324c8323
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
8575,8576c8574,8575
< REAL*8 LAMBDA, TX1, TX2, TS1, TS2, SR1, SR2, S24
< REAL*8 S, SUM, TP, TRAT, TRAT2, RT, RT2
---
> REAL LAMBDA, TX1, TX2, TS1, TS2, SR1, SR2, S24
> REAL S, SUM, TP, TRAT, TRAT2, RT, RT2
8578c8577
< REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
8586c8585
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
8590c8589
< REAL*8 QSC, VOL
---
> REAL QSC, VOL
8594c8593
< REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
> REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
8601c8600
< REAL*8 F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
---
> REAL F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHONEW(MXGRD),
8743c8742
```

```

<      REAL*8 LAMBDA, CF, TA, PC, CM, DIF, DPI
---
>      REAL LAMBDA, CF, TA, PC, CM, DIF, DPI
8745c8744
<      REAL*8 CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), VELISO(MXPTH,MXMEM), TRAVT(MXISO),
8753c8752
<      REAL*8 PORE(MXPTH), DT, Y
---
>      REAL PORE(MXPTH), DT, Y
8761c8760
<      REAL*8 DX(MXPTH), TMN(MXTSP), BF(NDBF)
---
>      REAL DX(MXPTH), TMN(MXTSP), BF(NDBF)
8765c8764
<      REAL*8 F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHOM(MXGRD,MXMEM),
---
>      REAL F(NDDF), SF(NDSF), RHO(MXGRD,MXMEM), RHOM(MXGRD,MXMEM),
8769c8768
<      REAL*8 V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
---
>      REAL V(MXNVI,MXSUB,MXPTH), DXX, B(2*MXNVI, MXSUB, MXPTH),
8885c8884
<      REAL*8 dummyarray(maxtim,1), LAMBDA, tempc(mxiso)
---
>      REAL dummyarray(maxtim,1), LAMBDA, tempc(mxiso)
8887,8890c8886,8889
<      REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
<      REAL*8 dr2tim(maxrec), dr2vol(maxrec)
<      REAL*8 filcur(mxiso,maxrec), filtim(maxrec)
<      REAL*8 filvol(maxrec), tarr(maxtim), totvol(maxtim)
---
>      REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
>      REAL dr2tim(maxrec), dr2vol(maxrec)
>      REAL filcur(mxiso,maxrec), filtim(maxrec)
>      REAL filvol(maxrec), tarr(maxtim), totvol(maxtim)
8895c8894
<      REAL*8 CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
8903c8902
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
8959c8958
<      REAL*8 dummyarray(maxtim,1), LAMBDA, tempc(mxiso), tempv(maxtim)
---
>      REAL dummyarray(maxtim,1), LAMBDA, tempc(mxiso), tempv(maxtim)
8961c8960
<      REAL*8 curies(maxtim,mxiso), dr2tim(maxrec), filvol(maxrec),
---
>      REAL curies(maxtim,mxiso), dr2tim(maxrec), filvol(maxrec),
8967c8966
<      REAL*8 CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
---
>      REAL CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
8975c8974
<      REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
>      REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
9011c9010
<      REAL*8 LAMBDA
---
>      REAL LAMBDA

```

```

9013,9016c9012,9015
< REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
< REAL*8 dr2tim(maxrec), dr2vol(maxrec)
< REAL*8 filcur(mxiso,maxrec), filtim(maxrec)
< REAL*8 filvol(maxrec), tarr(maxtim), totvol(maxtim)
---
> REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
> REAL dr2tim(maxrec), dr2vol(maxrec)
> REAL filcur(mxiso,maxrec), filtim(maxrec)
> REAL filvol(maxrec), tarr(maxtim), totvol(maxtim)
9021c9020
< REAL*8 CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
9029c9028
< REAL*8 TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
---
> REAL TUB, TRLSE, TLCH, SUMIN(MXMEM), SUMOUT(MXMEM), QDIS
9067c9066
< real*8 slope, t(maxtim), delt, dt, var(maxtim,nmax), val(nmax)
---
> real slope, t(maxtim), delt, dt, var(maxtim,nmax), val(nmax)
9114c9113
< REAL*8 LAMBDA
---
> REAL LAMBDA
9123c9122
< REAL*8 conc, u234(maxrec), u234tm(maxrec)
---
> REAL conc, u234(maxrec), u234tm(maxrec)
9125,9128c9124,9127
< REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
< REAL*8 dr2tim(maxrec), dr2vol(maxrec)
< REAL*8 filcur(mxiso,maxrec), filtim(maxrec)
< REAL*8 filvol(maxrec), tarr(maxtim), totvol(maxtim)
---
> REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec)
> REAL dr2tim(maxrec), dr2vol(maxrec)
> REAL filcur(mxiso,maxrec), filtim(maxrec)
> REAL filvol(maxrec), tarr(maxtim), totvol(maxtim)
9136c9135
< REAL*8 CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
9210c9209
< REAL*8 LAMBDA
---
> REAL LAMBDA
9219c9218
< REAL*8 conc
---
> REAL conc
9221c9220
< REAL*8 CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
---
> REAL CUROUT(MXMEM), CURZTR(MXISO), TRAVT(MXISO),
9232c9231
< REAL*8 curies(maxtim,mxiso), dr2cur(mxiso,maxrec), tarr(maxtim),
---
> REAL curies(maxtim,mxiso), dr2cur(mxiso,maxrec), tarr(maxtim),

```



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-204</b>		
02. Project Title: <b>TPA Code Version 3.1</b>		20-5708-762 Project Number:
03. SPCR Title: <b>Incorrect Index for array RHO in subroutine TRNSPT</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>nefmks.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Array out of bound error</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Please see attached</b>		
07. Originator: <b>T. McCastin</b>	Title: <b>NRC</b>	Date: <b>9/19/97</b>
PROJECT		
08. Need by Date:	09. Approved: <b>[Signature]</b>	Disapproved: <b>(10/1/97)</b>
10. Software Developer: <b>S. Mohanty et al.</b>	Date: <b>9/19/97</b>	
11. Element Manager: <b>S. Mohanty for R. Baca</b>	Date: <b>10/1/97</b>	
12. IMPLEMENTED SOLUTION		
<b>Please see attached</b>		
13. Implemented By: <b>Original implementation by R. Codell</b>		Date: <b>prior 9/19/97</b>

**postscript**

**JOB 903**

**SPCR.003**

**For:** Sitakanta Mohanty  
**Creator:** Microsoft Word: LaserWriter 8 8.3.4  
**Creation Date:** 5:32 PM Friday, September 19, 1997

**Submit queue:** IF 1 / Ethernet / ETHERTALK  
**Submitted:** Thu Sep 19 17:38:11 1997  
**Started:** Thu Sep 19 17:38:12 1997



**QMS 3825 Print System**

**QMS 3825 Print System**

01. SPCR Number: 3

02. Project Title: TPA Code  
Project Number: NA

03. SPCR Title: Incorrect index for array RHO in  
subroutine TRNSPT

#### 04. AFFECTED SOFTWARE AND/OR DOCUMENTATION

NEFTRAN II - software only

#### 05. DESCRIPTION OF PROBLEM/CHANGE

The subroutine TRNSPT loops over the RHO array (array that contains the density of atoms) in a calculation that determines the amount of mass that discharges in a given time step. For certain chains and retardation values the index on RHO attains a negative or zero value (the occurrence is tied to having the last member of a chain with a short halflife such that it is not considered important in NEFTRAN II and thus does not affect the selection of a time step when this "unimportant" nuclide is the least retarded nuclide in the chain it goes further than the other members in the chain but is not used in determining the time step). The error arises when the increment for the RHO array is determined in subroutine SETDIS by evaluating the furthest distance that the last member in the chain can travel. If the largest velocity value in the velocity distribution results in a travel time to discharge which is less than the time step then the calculation results in a path length that is larger than that specified in the problem input - this results in undefined array locations being addressed in the RHO array.

#### 06. PROBLEM SOLUTION/NEED FOR CHANGE

The solution to this problem is to perform a check on the calculation and not allow the travel distance to exceed the problem size which in the code is defined as NTX (total number of grid blocks).

In Subroutine SETDIS

old line:  $L = V(NVI, KP, NPT) * DT / DX(NPT) + 1$

correction:  $L = V(NVI, KP, NPT) * DT / DX(NPT) + 1$   
IF (L .GT. NTX) L=NTX

07. Originator:

Tim McCartin

Title:

Analyst

Date: 9/17/97

PROJECT

08. Need by Date:

09. Approved:

Disapproved:

10. Software Developer:

Date:

11. Element Manager:

Date:

12. IMPLEMENTED SOLUTION

13. Implemented By:

Date:

4172a4173,4176

```
> c rwj 9/18/97 Add line to prevent 0 subscript in RHO array for last member
> c in a chain of 3 or more.
> IF (L .GT. NTX) L = NTX
> c
```

*diff nefmks.f nefmksrho.f*

listing of dff script.

```
echo diff tpa.inp
diff tpa.inp $1
echo diff tpa.inp.meanvalues
diff tpa.inp.meanvalues $1
echo diff NEFII.VEL
diff NEFII.VEL $1
echo diff ashplume.in
diff ashplume.in $1
echo diff ashplume.out
diff ashplume.out $1
echo diff ashplumo.ech
diff ashplumo.ech $1
echo diff ashplumo.res
diff ashplumo.res $1
echo diff ashrmovo.ech
diff ashrmovo.ech $1
echo diff ashrmovo.res
diff ashrmovo.res $1
echo diff chloridemf.dat
diff chloridemf.dat $1
echo diff climato1.dat
diff climato1.dat $1
echo diff climato2.dat
diff climato2.dat $1
echo diff climato.inp
diff climato.inp $1
echo diff corrode.out
diff corrode.out $1
echo diff cp.tpa
diff cp.tpa $1
echo diff cumcl4.out
diff cumcl4.out $1
echo diff dcags.ech
diff dcags.ech $1
echo diff dcags.res
diff dcags.res $1
echo diff dcagw.ech
diff dcagw.ech $1
echo diff dcagw.res
diff dcagw.res $1
echo diff dignostic.out
diff dignostic.out $1
echo diff ebsfail.ech
diff ebsfail.ech $1
echo diff ebsfail.inp
diff ebsfail.inp $1
echo diff ebsfail.res
diff ebsfail.res $1
echo diff ebsfail.tmp
diff ebsfail.tmp $1
echo diff ebsflo.dat
diff ebsflo.dat $1
# echo diff ebsnef.dat
# diff ebsnef.dat $1
echo diff ebsnuc.dat
diff ebsnuc.dat $1
echo diff ebspac.nuc
diff ebspac.nuc $1
echo diff ebsrel.ech
diff ebsrel.ech $1
echo diff ebsrel.inp
diff ebsrel.inp $1
echo diff ebsrel.res
diff ebsrel.res $1
echo diff ebsrel.tmp
```

```
diff ebsrel.tmp $1
echo diff ebstrh.dat
diff ebstrh.dat $1
echo diff ebstrhc.inp
diff ebstrhc.inp $1
echo diff echo_fail.dat
diff echo_fail.dat $1
echo diff echo_release.out
diff echo_release.out $1
echo diff gwccdf.res
diff gwccdf.res $1
echo diff gsccdf.res
diff gsccdf.res $1
echo diff relccdf.res
diff relccdf.res $1
echo diff relgwgs.res
diff relgwgs.res $1
echo diff totdose.res
diff totdose.res $1
echo diff fault.out
diff fault.out $1
echo diff faulto.ech
diff faulto.ech $1
echo diff faulto.res
diff faulto.res $1
echo diff infile.ash
diff infile.ash $1
echo diff invl000.out
diff invl000.out $1
echo diff junk.out
diff junk.out $1
echo diff maxrel.dat
diff maxrel.dat $1
echo diff multiflo.dat
diff multiflo.dat $1
echo diff nefii.inp
diff nefii.inp $1
echo diff nefiisz.inp
diff nefiisz.inp $1
echo diff nefiiuz.inp
diff nefiiuz.inp $1
echo diff nefiiuz.vel
diff nefiiuz.vel $1
echo diff nfenv.ech
diff nfenv.ech $1
echo diff nfenv.res
diff nfenv.res $1
echo diff ratecl4.out
diff ratecl4.out $1
echo diff rectedge.dat
diff rectedge.dat $1
echo diff relcum.out
diff relcum.out $1
echo diff release.out
diff release.out $1
echo diff releaset.out
diff releaset.out $1
echo diff relfrac.out
diff relfrac.out $1
echo diff rgsna.tpa
diff rgsna.tpa $1
echo diff rgsnr.tpa
diff rgsnr.tpa $1
echo diff rgssa.tpa
diff rgssa.tpa $1
```

echo diff rgssr.tpa  
diff rgssr.tpa \$1  
echo diff rgwgssa.tpa  
diff rgwgssa.tpa \$1  
echo diff rgwna.tpa  
diff rgwna.tpa \$1  
echo diff rgwnr.tpa  
diff rgwnr.tpa \$1  
echo diff rgwsa.tpa  
diff rgwsa.tpa \$1  
echo diff rgwsr.tpa  
diff rgwsr.tpa \$1  
echo diff seismo.ech  
diff seismo.ech \$1  
echo diff seismo.res  
diff seismo.res \$1  
echo diff soildep.dem  
diff soildep.dem \$1  
echo diff sotnef.dat  
diff sotnef.dat \$1  
echo diff sp.tpa  
diff sp.tpa \$1  
echo diff spquery.tpa  
diff spquery.tpa \$1  
echo diff szft.ech  
diff szft.ech \$1  
echo diff szft.res  
diff szft.res \$1  
echo diff temphumd.dat  
diff temphumd.dat \$1  
echo diff transition.out  
diff transition.out \$1  
echo diff treleasel.out  
diff treleasel.out \$1  
echo diff uzflow.ech  
diff uzflow.ech \$1  
echo diff uzflow.res  
diff uzflow.res \$1  
echo diff uzft.ech  
diff uzft.ech \$1  
echo diff uzft.res  
diff uzft.res \$1  
echo diff volcano.ech  
diff volcano.ech \$1  
echo diff volcano.res  
diff volcano.res \$1  
echo diff watrel.in  
diff watrel.in \$1  
echo diff ymelev.dem  
diff ymelev.dem \$1  
echo diff nefii.out  
diff nefii.out \$1  
echo diff nefii.rel  
diff nefii.rel \$1  
echo diff nefiisz.out  
diff nefiisz.out \$1  
echo diff nefiisz.src  
diff nefiisz.src \$1  
echo diff nefiiuz.out  
diff nefiiuz.out \$1  
echo diff nefiiuz.src  
diff nefiiuz.src \$1  
echo diff mv.tpa  
diff mv.tpa \$1  
echo airpkdos.res



```
diff airpkdos.res $1
echo ashout.res
diff ashout.res $1
echo ccdfgwgs.res
diff ccdfgwgs.res $1
echo cumrel.res
diff cumrel.res $1
echo cumrelease.out
diff cumrelease.out $1
echo gwpkdos.res
diff gwpkdos.res $1
echo gwtuzsz.res
diff gwtuzsz.res $1
echo infilper.res
diff infilper.res $1
echo nearfld.res
diff nearfld.res $1
echo npkdoset.res
diff npkdoset.res $1
echo pkreldim.res
diff pkreldim.res $1
echo samplpar.res
diff samplpar.res $1
echo totdose.res
diff totdose.res $1
echo wpsfail.res
diff wpsfail.res $1
echo lhs.inp
diff lhs.inp $1
echo lhs.out
diff lhs.out $1
echo samplpar.hdr
diff samplpar.hdr $1
echo samplpar.abb
diff samplpar.abb $1
echo tpa.out
diff tpa.out $1
```

output of diff script.

```
diff tpa.inp
diff tpa.inp.meanvalues
diff NEFII.VEL
diff ashplume.in
diff ashplume.out
diff ashplumo.ech
diff ashplumo.res
diff ashrmovo.ech
diff ashrmovo.res
diff chloridemf.dat
diff climatol.dat
diff climato2.dat
diff climato.inp
diff corrode.out
diff cp.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff cumcl4.out
diff dcags.ech
diff dcags.res
diff dcagw.ech
diff dcagw.res
diff dignostic.out
diff ebsfail.ech
diff ebsfail.inp
diff ebsfail.res
diff ebsfail.tmp
diff ebsflo.dat
diff ebsnuc.dat
diff ebspac.nuc
diff ebsrel.ech
diff ebsrel.inp
diff ebsrel.res
diff ebsrel.tmp
diff ebstrh.dat
diff ebstrhc.inp
diff echo_fail.dat
diff echo_release.out
diff gwccdf.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff gsccdf.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff relccdf.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff relgwgs.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff totdose.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
```

```
diff fault.out
4c4
< Fri Sep 19 09:20:35 1997
---
> Thu Sep 18 14:34:18 1997
diff faulto.ech
diff faulto.res
diff infile.ash
diff inv1000.out
diff junk.out
diff maxrel.dat
diff multiflo.dat
diff nefii.inp
diff nefiisz.inp
diff nefiiuz.inp
diff nefiiuz.vel
diff nfenv.ech
diff nfenv.res
diff ratecl4.out
diff rectedge.dat
diff relcum.out
diff release.out
diff releaset.out
3c3
< Fri Sep 19 09:20:38 1997
---
> Thu Sep 18 14:34:21 1997
diff relfrac.out
diff rgsna.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgsnr.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgssa.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgssr.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgwgssa.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgwna.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgwnr.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgwsa.tpa
3c3
```

```

< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff rgwsr.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff seismo.ech
diff seismo.res
diff soildep.dem
diff sotnef.dat
diff sp.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
diff spquery.tpa
diff szft.ech
diff szft.res
diff temphumd.dat
diff transition.out
diff treleasel.out
diff uzflow.ech
diff uzflow.res
diff uzft.ech
diff uzft.res
diff volcano.ech
diff volcano.res
diff watrel.in
diff ymelev.dem
diff nefii.out
9c9
<      *      EXECUTION DATE  Sep 19   AND TIME  09:20:4      *
---
>      *      EXECUTION DATE  Sep 18   AND TIME  14:34:3      *
diff nefii.rel
diff nefiisz.out
9c9
<      *      EXECUTION DATE  Sep 19   AND TIME  09:20:4      *
---
>      *      EXECUTION DATE  Sep 18   AND TIME  14:34:3      *
diff nefiisz.src
diff nefiiuz.out
9c9
<      *      EXECUTION DATE  Sep 19   AND TIME  09:20:1      *
---
>      *      EXECUTION DATE  Sep 18   AND TIME  14:34:0      *
diff nefiiuz.src
diff mv.tpa
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
airpkdos.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
ashout.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
ccdfgwgs.res

```

```
cumrel.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
cumrelease.out
gwpkdos.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
gwttuusz.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
infilper.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
nearfld.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
npkdoset.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
pkreltim.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
samplpar.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
toldose.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
wpsfail.res
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
lhs.inp
lhs.out
samplpar.hdr
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
samplpar.abb
3c3
< TPA 3.1, Job started: Fri Sep 19 09:05:20 1997
---
> TPA 3.1, Job started: Thu Sep 18 14:19:51 1997
tpa.out
```

total 11204

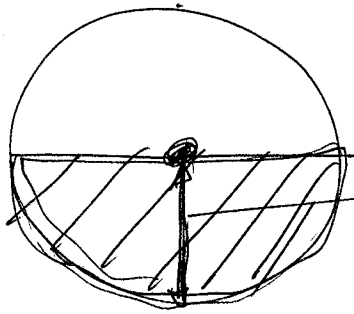
```

drwxr-xr-x  2 janetzke sunuser  2048 Sep 18 14:44 .
drwx----- 22 janetzke sunuser  7168 Sep 19 17:22 ..
-rw-r--r--  1 janetzke sunuser    93 Sep 18 14:34 NEFII.VEL
-rw-r--r--  1 janetzke sunuser  4209 Sep 18 14:34 airpkdos.res
-rw-r--r--  1 janetzke sunuser  1161 Sep 18 14:34 ashout.res
-rwxr-xr-x  1 janetzke sunuser 125668 Sep 18 14:27 ashplume.e
-rw-r--r--  1 janetzke sunuser  1550 Sep 18 14:34 ashplume.in
-rw-r--r--  1 janetzke sunuser  2041 Sep 18 14:34 ashplume.out
-rw-r--r--  1 janetzke sunuser  8674 Sep 18 14:34 chloridemf.dat
-rw-r--r--  1 janetzke sunuser 850000 Sep 18 14:20 climato1.dat
-rw-r--r--  1 janetzke sunuser  2460 Sep 18 14:20 climato2.dat
-rw-r--r--  1 janetzke sunuser 14506 Sep 18 14:34 corrode.out
-rw-r--r--  1 janetzke sunuser 48503 Sep 18 14:34 cp.tpa
-rw-r--r--  1 janetzke sunuser  6927 Sep 18 14:34 cumc14.out
-rw-r--r--  1 janetzke sunuser  5367 Sep 18 14:34 cumrel.res
-rw-r--r--  1 janetzke sunuser 46580 Sep 18 14:34 cumrelease.out
-rw-r--r--  1 janetzke sunuser  9800 Sep 18 14:34 dignostic.out
-rw-r--r--  1 janetzke sunuser  4697 Sep 18 14:34 ebsfail.inp
-rw-r--r--  1 janetzke sunuser  6392 Sep 18 14:34 ebsflo.dat
-rw-r--r--  1 janetzke sunuser 108203 Sep 18 14:34 ebsnef.dat
-rw-r--r--  1 janetzke sunuser  1648 Sep 18 14:20 ebsnuc.dat
-rw-r--r--  1 janetzke sunuser  4698 Sep 18 14:34 ebspac.nuc
-rw-r--r--  1 janetzke sunuser  6075 Sep 18 14:34 ebsrel.inp
-rw-r--r--  1 janetzke sunuser 10968 Sep 18 14:34 ebstrh.dat
-rw-r--r--  1 janetzke sunuser  9923 Sep 18 14:34 ebstrhc.inp
-rw-r--r--  1 janetzke sunuser  1943 Sep 18 14:34 echo_fail.dat
-rw-r--r--  1 janetzke sunuser 141723 Sep 18 14:34 echo_release.out
-rwxr-xr-x  1 janetzke sunuser 104084 Sep 18 14:20 failt.e
-rw-r--r--  1 janetzke sunuser 17302 Sep 18 14:34 failt.out
-rw-r--r--  1 janetzke sunuser 46580 Sep 18 14:34 frac_relrate.out
-rw-r--r--  1 janetzke sunuser   637 Sep 18 14:34 gsccdf.res
-rw-r--r--  1 janetzke sunuser   637 Sep 18 14:34 gwccdf.res
-rw-r--r--  1 janetzke sunuser 2529 Sep 18 14:34 gwpkdos.res
-rw-r--r--  1 janetzke sunuser 2529 Sep 18 14:34 gwtuzsz.res
-rw-r--r--  1 janetzke sunuser   540 Sep 18 14:34 infile.ash
-rw-r--r--  1 janetzke sunuser 5601 Sep 18 14:34 infilper.res
-rw-r--r--  1 janetzke sunuser 1103 Sep 18 14:34 inv1000.out
-rw-r--r--  1 janetzke sunuser 3655 Sep 18 14:34 junk.out
-rw-r--r--  1 janetzke sunuser 25192 Sep 18 14:20 lhs.inp
-rw-r--r--  1 janetzke sunuser 10542 Sep 18 14:20 lhs.out
-rw-r--r--  1 janetzke sunuser  1218 Sep 18 14:34 maxrel.dat
-rw-r--r--  1 janetzke sunuser 1274984 Sep 18 14:20 multiflo.dat
-rw-r--r--  1 janetzke sunuser 61558 Sep 18 14:34 mv.tpa
-rw-r--r--  1 janetzke sunuser 5601 Sep 18 14:34 nearfld.res
-rw-r--r--  1 janetzke sunuser 14806 Sep 18 14:34 nefii.inp
-rw-r--r--  1 janetzke sunuser 49356 Sep 18 14:34 nefii.out
-rw-r--r--  1 janetzke sunuser   456 Sep 18 14:34 nefii.rel
-rw-r--r--  1 janetzke sunuser 14806 Sep 18 14:34 nefiisz.inp
-rw-r--r--  1 janetzke sunuser 49356 Sep 18 14:34 nefiisz.out
-rw-r--r--  1 janetzke sunuser 113379 Sep 18 14:34 nefiisz.src
-rw-r--r--  1 janetzke sunuser  8962 Sep 18 14:34 nefiiuz.inp
-rw-r--r--  1 janetzke sunuser 38414 Sep 18 14:34 nefiiuz.out
-rw-r--r--  1 janetzke sunuser 116799 Sep 18 14:34 nefiiuz.src
-rw-r--r--  1 janetzke sunuser    93 Sep 18 14:34 nefiiuz.vel
-rwxr-xr-x  1 janetzke sunuser 691232 Sep 18 14:20 nefmks.e
-rw-r--r--  1 janetzke sunuser 3809 Sep 18 14:34 npkdoset.res
-rw-r--r--  1 janetzke sunuser 16287 Sep 18 14:34 pkreltim.res
-rw-r--r--  1 janetzke sunuser  7413 Sep 18 14:34 ratecl4.out
-rw-r--r--  1 janetzke sunuser  2260 Sep 18 14:20 rectedge.dat
-rw-r--r--  1 janetzke sunuser   637 Sep 18 14:34 relccdf.res
-rw-r--r--  1 janetzke sunuser   718 Sep 18 14:34 relcum.out
-rwxr-xr-x  1 janetzke sunuser 115576 Sep 18 14:20 releaset.e
-rw-r--r--  1 janetzke sunuser 16340 Sep 18 14:34 releaset.out
-rw-r--r--  1 janetzke sunuser   620 Sep 18 14:34 relfrac.out

```

listing of  
files in  
ssv3r7a

```
-rw-r--r-- 1 janetzke sunuser      841 Sep 18 14:34 relgwgs.res
-rw-r--r-- 1 janetzke sunuser    98662 Sep 18 14:34 rgsna.tpa
-rw-r--r-- 1 janetzke sunuser   294602 Sep 18 14:34 rgsnr.tpa
-rw-r--r-- 1 janetzke sunuser    5132 Sep 18 14:34 rgssa.tpa
-rw-r--r-- 1 janetzke sunuser    14470 Sep 18 14:34 rgssr.tpa
-rw-r--r-- 1 janetzke sunuser    5132 Sep 18 14:34 rgwgssa.tpa
-rw-r--r-- 1 janetzke sunuser    47396 Sep 18 14:34 rgwna.tpa
-rw-r--r-- 1 janetzke sunuser   141124 Sep 18 14:34 rgwnr.tpa
-rw-r--r-- 1 janetzke sunuser    5132 Sep 18 14:34 rgwsa.tpa
-rw-r--r-- 1 janetzke sunuser    14470 Sep 18 14:34 rgwsr.tpa
-rw-r--r-- 1 janetzke sunuser    2566 Sep 18 14:20 samplpar.abb
-rw-r--r-- 1 janetzke sunuser    18386 Sep 18 14:20 samplpar.hdr
-rw-r--r-- 1 janetzke sunuser    11183 Sep 18 14:34 samplpar.res
-rw-r--r-- 1 janetzke sunuser   113379 Sep 18 14:34 sotnef.dat
-rw-r--r-- 1 janetzke sunuser    28640 Sep 18 14:34 sp.tpa
-rw-r--r-- 1 janetzke sunuser    3833 Sep 18 14:21 strmtube.dat
-rw-r--r-- 1 janetzke sunuser    38041 Sep 18 14:34 totdose.res
-rw-r--r-- 1 janetzke sunuser    43382 Sep 18 14:44 tpa.inp
-rw-r--r-- 1 janetzke sunuser    44896 Sep 18 14:44 tpa.inp.basecase
-rw-r--r-- 1 janetzke sunuser    41519 Sep 18 14:34 tpa.out
-rw-r--r-- 1 janetzke sunuser   103334 Sep 18 14:19 tpanames.dbs
-rw-r--r-- 1 janetzke sunuser   146820 Sep 18 14:34 treleasel.out
-rw-r--r-- 1 janetzke sunuser    21389 Sep 18 14:34 watrel.in
-rw-r--r-- 1 janetzke sunuser    1753 Sep 18 14:34 wpsfail.res
```



wetfac  
spent fuel wetted fraction.



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-165		
02. Project Title: TPA Code Testing		20-5708-782 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
reaset.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Though the TPA code does not use compute gaseous releases, it was observed that C14 release rate could be -ve in certain conditions.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
(fclad-fcladpr) etc. were changed to abs(fclad-fcladpr).		
07. Originator: James Weldy	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: Sitakanta Mohanty	Date: 7/16/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as shown in #6. See Scientific note book also.		
13. Implemented By: Sitakanta Mohanty	Date: 7/16/97	

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-164		
02. Project Title: TPA 3.1 Code Testing		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
snllhs.f, sampler.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
snllhs.f was not capable of sampling from beta distributions and finite exponential distribution.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add new algorithms for introducing beta and finite exponential distributions. The existing beta distribution need to be replaced.		
07. Originator: R. Codell	Title: NRC	Date: 7/1/97
PROJECT		
08. Need by Date: 7/8/97	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 7/8/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Nearly 2000 lines of the original code was deleted and new algorithms were added as described in #6.		
13. Implemented By: R. Codell and S. Mohanty		Date: 7/8/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-163		
02. Project Title: TPA 3.0 modification		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Sampler.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
normal and lognormal distributions are being labelled uniform and loguniform		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
subroutine writesnllhsip. if itype = 4, change 'UNIFORM' to 'NORMAL' in format if itype = 5, change 'LOGUNIFORM' to 'LOGNORMAL' in format		
07. Originator: C. Scherer	Title:	Date: 7/11/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
See #06		
13. Implemented By: Sitakanta Mohanty		Date: 7/11/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-203</b>	
02. Project Title: <b>TPA3.1</b>	20-5708-762 Project Number:
03. SPCR Title: <b>Comprehensive WPSFAIL.RES Output.</b>	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
<b>exec.f</b>	
05. DESCRIPTION OF PROBLEM/CHANGE	
<p>a) File wpsfail.res does not contain output for realizations with <math>\emptyset</math> non-initial canister failure. Also:</p> <p>b) File gwpcdos.res displays year <math>\emptyset</math> for time of drinking water peak dose when peak dose is <math>\emptyset</math>.</p>	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
<p>a) At least one entry should be contained in wpsfail.res for each realization. If there are no canister failures for a given realization, zeroes should be displayed for time of failure equal to the simulation time.</p> <p>b) The time of drinking water peak dose should be the simulation end time, when the d.w. peak dose is zero.</p>	
07. Originator: <b>V. Colten-Bredt</b>	Title: <b>NRC</b> Date: <b>9-15-97</b>
PROJECT	
08. Need by Date:	09. Approved: <b>[Signature]</b> Disapproved: <b>10/1/97</b>
10. Software Developer: <b>S. Mohanty et al.</b>	Date:
11. Element Manager: <b>S. Mohanty for R. Baca</b>	Date: <b>10/1/97</b>
12. IMPLEMENTED SOLUTION	
<p>a) a special loop was added to exec.f after the write to wpsfail.res for each realization to detect if any event failure times were written. If not, an event time equal to the simulation time is written</p> <p>b) The time of drinking water peak dose is initialized to the simulation time before the data is scanned for a peak.</p>	
13. Implemented By: <b>Ron Jones</b>	Date: <b>9-22-97</b>

followed by all zeroes.

b) The time of drinking water peak dose is initialized to the simulation time before the data is scanned for a peak.

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-202</b>		
02. Project Title: <b>TPA3 code testing</b>		Project Number: <b>5708-762</b>
03. SPCR Title: <b>NEFMKS Velocity calculations.</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>nefmks.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Change nefmks.f per FAX from T. McCartin.</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>This will permit larger time steps to be used when processing the NEFTT, VEL file. This will decrease the run times for 100,000 year runs.</b>		
07. Originator: <b>T. McCartin</b>	Title: <b>NRC</b>	Date: <b>8-21-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>Implemented as shown in the diff utility output attached.</b>		
13. Implemented By: <b>Ron Gant</b>		Date: <b>8-26-97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-201</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-162 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
reflux2 model does not compute correctly the flow rate at larger time. Subroutine in nfenvr.f is not seamless with its standalone version.		
05. DESCRIPTION OF PROBLEM/CHANGE		
The time intervals were not considered properly. It was using 1yr intervals.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Done as #05		
07. Originator: <b>S. Mohanty</b> Title:		Date: <del>7/11/97</del> <b>7/11/97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
See #05		
13. Implemented By: <b>Sitakanta Mohanty</b>		Date: <b>7/11/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-200</b>		
02. Project Title: <b>TPA</b>		20-5708-762 Project Number:
03. SPCR Title: <b>Recind change to TRANSPT routine</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>hefmls.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>The original change of the TRANSPT routine to use 'je' instead of 'js' is unjustified. The modification to routine CATCH omitted the "xx2" for velocity.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>The KNTIP should = JS-IR. Add "xx2" to the velocity in CATCH.</p>		
07. Originator: <b>T. McCartin</b>	Title:	Date: <b>9-3-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: <b>Janezke</b>		Date: <b>9-3-97</b>
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>As shown in 06 above.</b>		
13. Implemented By: <b>R. Janetzke</b>		Date: <b>9-3-97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA - SPCR-199</b>		
02. Project Title: <b>TPA Code Development</b>		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>nefmks.f (standalone code)</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Change JS-IR to JE-IR on line #9105 in order to eliminate -VE <del>error</del> subscript error in rho</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Changed as shown in #05</b>		
07. Originator: <b>T. McCartin</b>	Title: <b>NRC</b>	Date: <b>6/27/97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>See #06</b>		
13. Implemented By: <b>T. McCartin</b>		Date: <b>6/27/97</b>



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-198</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<del>Add</del> snllhs.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Add new distribution functions to the SNL LHS sampler code. The distribution functions are: exponential and logtriangular.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
New function added for #05		
07. Originator: <b>S. Mohanty</b>	Title:	Date: <b>8/01/97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
New distribution functions implemented and tested. Test results are attached.		
13. Implemented By: <b>R. Codell (NRC)</b>		Date: <b>8/15/97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-197</b>		
02. Project Title: <b>TPA Code Testing</b>		Project Number: <b>20-5-705-2622</b>
03. SPCR Title: <b>Modifs szft for writing L0 Legls to netii.inp</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>szft-f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
For coordinates other than with 1 n 7 subarea there were occasions when an error would occur (e.g. 2 subarea + 14 subarea error).		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modifs szft-f to correctly determine whether there is an intersection between a subarea side and one of the straight coastline pts. - which arises for isolated combinations (not 1 n 7 subarea)		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06. above		
13. Implemented By: <b>R. Rice</b>		Date: <b>9/3/97</b>

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for isolated combinations (not 1 n 7 subarea)

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-196</b>		
02. Project Title: <b>HA Code Testing</b>		20-5708-7632 Project Number:
03. SPCR Title: <b>Modify HA code to Remove Duplicate Parameters</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>ehsrel.f</b> <b>tpa.inp</b> <b>parameters.dbf</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Mass of Spent Fuel per WP was defined twice in tpa.inp (a value of 8.8 instead of 9.76 was set)</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Remove the duplicate parameters (remove SFmass PSLWP(KG)) &amp; keep workload payload (MW) and change from 8.8 MW/WP to 9.76 MW/WP, modify ehsrel to read the latter.</b>		
07. Originator: <b>M. Jizemba</b>	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as described above</b>		
13. Implemented By: <b>P. Ric</b>	Date: <b>7/3/97</b>	

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-195</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number: 762
03. SPCR Title: <b>Modify code to stop instead of pause (and continuing by typing go)</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
stop.i array.f exec.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
TPA codes would continue execution if user typed a "go", instead of stopping execution when an error occurred in the tpa execution - this could give results that were meaningless because of the error		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Make sure that code stops by changing stop.i to a stop (instead of a pause) - also comment out return in array.f & exec.f subroutines that are not needed		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section .01		
13. Implemented By: <b>R. Rice</b>		Date: <b>2/3/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SACR-194</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-2622 Project Number: <b>762</b>
03. SPCR Title: <b>Modify exec.f to write spquery.tpa when APPEND is on</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>exec.f softfiles.i</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>The spquery.tpa is a file intended to be written only when the APPEND flag is on. (The header was written in all cases)</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>modify exec.f to write spquery.tpa in the same way the APPEND files x.rlt, x.cmt &amp; x.edb are written</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as described above in Section 04.</b>		
13. Implemented By: <b>R. Rio</b>		Date: <b>9/3/97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-193</b>		
02. Project Title: <b>TPA Code Testing</b>		Project Number: <b>20-S-708-2621</b> 762
03. SPCR Title: <b>Modify "nfhydro" to "reflux1"</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>tpa.inp nfenv.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>There were references to an "nfhydro" model which should for reasons of clarity be changed to reflux1</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Change params and model names to match reflux1 or reflux2</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Modified and Implemented as described in section 06.</b>		
13. Implemented By: <b>R. Rice</b>		Date: <b>2/2/77</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-192</b>	
02. Project Title: <b>TPA Code Testing</b>	20-5-708-762E Project Number:
03. SPCR Title: <b>Remove spaces and duplicate parameter for tpa.inp</b>	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
tpa.inp    ashplum.o.f    nferu.f    reishu.f deags.f    ebsfail.f    sampler.f    seft.f deagw.f    ebsrel.f    exec.f    tparamet.dbf	
05. DESCRIPTION OF PROBLEM/CHANGE	
there were parameters in tpa.inp file w/ spaces (which is inconsistent with the overall intention NOT to have spaces in names); also NRC stated spaces in parameter names cause S/W problem; additionally pH was defined twice in the tpa code	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
remove spaces (or add -) to tpa.inp parameter names and use only 1 value (+ tpa.inp parameter) for pH	
07. Originator:	Title:      Date:
PROJECT	
08. Need by Date:	09. Approved:      Disapproved:
10. Software Developer:	Date:
11. Element Manager:	Date:
12. IMPLEMENTED SOLUTION	
Implemented as described above.	
13. Implemented By: <b>R. Rio</b>	Date: <b>8/1/97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-191</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number: <b>762</b>
03. SPCR Title: <b>Modify TPA Code for 20km Critical Group (instead of 30km)</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>dca95.f</b> <b>strutube.dat</b> <b>tpa.inp</b> <b>dca9w.f</b> <b>strut.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>NRC requested to calculate dots @ 5 km &amp; 20 km</b> <b>(instead of @ 5 km &amp; 30 km)</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Modify strutube.dat to allow for 20km leg length</b> <b>(supplied from G. Wittmeyer) + other codes (see above)</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>Implemented as described in section 06</b>		
13. Implemented By: <b>P. Ricci</b>		Date: <b>9/1/97</b>



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-190</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-762 Project Number: <b>762</b>
03. SPCR Title: <b>Modify array index in seismo.f for consistency/correctness</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>seismo.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Incorrect index in array (ij instead of j)</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Need to avoid error message arising from incorrect array index</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as desired above</b>		
13. Implemented By: <b>R-Rio</b>		Date: <b>8/1/97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-189</b>		
02. Project Title: <b>TPA Code Testing</b>		20-3708-7622 Project Number: <b>762</b>
03. SPCR Title: <b>Modify exec.f for NRC-requested output format, closing files, and copying</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>exec.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>NRC requested 4 decimal places in x.res files; also external results in these files; closed 2 files which were read, but not closed; and added lines to copy tpawmes.dbs from the data subdirectory</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>modify code for x.res format, closing files &amp; copying tpawmes.dbs</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>Implemented as described above in Sect 06</b>		
13. Implemented By: <b>R. Rice</b>		Date: <b>8/1/77</b>

762  
copying tpawmes.dbs  
from  
data

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-188</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5-708-17622 Project Number: <b>762</b>
03. SPCR Title: <b>Modifs exec.f to write results to *.tpa files (Ground Surface)</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>exec.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Results for ground surface doses (averaged of all realizations - rgsna.tpa) &amp; was not being written <del>correct</del></b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Modifs exec.f to calculate these average values &amp; write them to rgsna.tpa</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as desired above</b>		
13. Implemented By: <b>R. Klein</b>		Date: <b>8/1/97</b>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-187</b>		
02. Project Title: <b>TPA Code Testby</b>		Project Number: <b>24-5708-7622</b> 762
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Reader-f Sampler-f S11/hs. f tpa.inp		
05. DESCRIPTION OF PROBLEM/CHANGE		
TPA code could <del>not</del> run with barecate tpa.inp file while in LHS mode		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify the tpa code (section 04 files) to read in tpa.inp data in format consistent with LHS (i.e., S11/hs) and add user distribution for LHS mode <del>for exponential</del> and exponential distribution for LHS mode		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06.		
13. Implemented By: <b>S. Mohanty / L. Rice</b>		Date: <b>9/1/97</b>

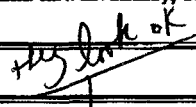
## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-186</b>			
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number: 762	
03. SPCR Title: <b>Modify volcanof for determining Area Disturbed</b>			
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION			
<b>volcanof</b>			
05. DESCRIPTION OF PROBLEM/CHANGE			
The overlap area (one overlap w/ dike) was incorrectly applied to any subarea which has an intersection with the dike — instead of just with the <u>one</u> subarea which contains the one.			
06. PROBLEM SOLUTION/NEED FOR CHANGE			
Modify volcanof to subtract the overlap area from the subarea which contains the one.			
07. Originator:		Title:	Date:
PROJECT			
08. Need by Date:		09. Approved:	Disapproved:
10. Software Developer:			Date:
11. Element Manager:			Date:
12. IMPLEMENTED SOLUTION			
Implemented as described above			
13. Implemented By: <b>P. Rico</b>			Date: <b>8/26/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: 3p1b4-03 → <i>PA-SPCR-185</i>		
02. Project Title: Beta Testing of TPA3.1beta4		Project Number:
03. SPCR Title: Problem with Monte Carlo Sampling of Exponential Distribution		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
sampler.f and something else (I have been unable to determine what).		
05. DESCRIPTION OF PROBLEM/CHANGE		
The exponential distribution is supposed to decrease exponentially. The sampled data (for both exponential distributions generated in my 100 vector run) decreased then increased. See attached sheets for one variable's distribution and Splus code to plot the distributions. Also, this distribution was generated by beta3 (I could not run another 100 vector 6 day simulation after beta4 came out).		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
If you can find the function rane (it does not seem to be in sampler.f) I think you will find the problem. I would have liked to do a 1000 vector simulation to verify that there is indeed an error, but my sun is slow, and it took 6 days for 100 vectors, implying that it would take 60 days for a 1000 vector simulation.		
07. Originator: M. Rose Byrne <i>RJB</i> Title: Sys. Perf. Analyst (Hydrology)		Date: August 29, 1997
PROJECT		
08. Need by Date: Sept 9, 1997	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
The code is computing correctly. Please see attached graphs.		
13. Implemented By: <i>Sitakanta Mohanty</i>		Date: <i>8/30/97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: 3p1b4-02		AA-SPCR-184	
02. Project Title: Beta Testing of TPA3.1bcta4		Project Number:	
03. SPCR Title: EPA sums computed incorrectly			
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION			
invent.f (subroutine newinventdb), subarea.f (subroutine quadrilateral)			
<div style="text-align: center;">  </div>			
<p>05. DESCRIPTION OF PROBLEM/CHANGE</p> <p>The EPA sums are being computed incorrectly. In trying to find out why, I found two problems. The first of them is in invent.f, subroutine newinventdb. At line 1435, epalim(15) is set to 0.1 when it should be set to 1.0 (see enclosed table from 40 CFR 191). I assume that epalim(17) and epalim(22) are set to 1000 because Pu241 and Cm244 have half-lives less than 20 years and therefore have no EPA limit. Also, note that the table expresses the limits in per 1000 MTHM and the code requires the limits per 1 MTHM.</p> <p>The second problem is in subarea.f, subroutine quadrilateral (lines 1050-1086 of subarea.f). The formula used to compute the area of the quadrilateral is not referenced and does not appear to be derived from any of the formulas I found in the CRC Handbook of Mathematical Functions (enclosed).</p> <p><i>yes</i>  <i>but this is OK and using ref. MTHM</i>  <i>generalized eqn. for polygons (see TPA 2 &amp; Rm Jaretsky)</i></p>			
06. PROBLEM SOLUTION/NEED FOR CHANGE			
<p>At line 1435 of invent.f, change 0.1 to 1.0.</p> <p>In subarea.f, I suggest changing lines 1075, 1077 (eliminate), 1081, 1083 to use the formula from the CRC handbook with the arrow drawn next to it.</p>			
07. Originator: M. Rose Byrne		Title: Sys. Perf. Analyst (Hydrology)	
		Date: August 28, 1997	
PROJECT			
08. Need by Date: Sept 9, 1997		09. Approved: <i>[Signature]</i>	
		Disapproved:	
10. Software Developer:		Date:	
11. Element Manager:		Date:	
12. IMPLEMENTED SOLUTION			
<p>Problems identified in #05 were tested and checked. The code has right data and is computing correctly.</p>			
13. Implemented By:		Date:	
Sifakanta Mohanty		9/4/97	

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: 3p1b4-04 → PA-SPCR-183		
02. Project Title: Beta Testing of TPA 3.1 beta4		28-5708-762 Project Number:
03. SPCR Title: Problem with LHS Sampling of Exponential, Logtriangular, and User Defined Distributions		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
snllbs.f and snllhs2.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
As Dick and I discussed with you, the program pauses with the "go" message when these distributions are encountered because these distributions are undefined.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Apply Dick's patch, which he sent via email.		
07. Originator: M. Rose Byrne <i>RB</i>	Title: Sys. Perf. Analyst (Hydrology)	Date: August 29, 1997
PROJECT		
08. Need by Date: Sept 9, 1997	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
This did not require any action. New snllhs was already implemented that had all <sup>the</sup> <del>three</del> above three distributions.		
13. Implemented By: Sitakanta Mohanty	Date: 9/4/97	



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-182</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ashrmov.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>On line 597 of ashrmov.f, a call is made to decayremove 43 mol. The second variable that is sent, dlt, is the total decay constant in ashrmov.f, including radioactive decay, blanket removal, and leaching. In decayremove 43 mol, however, the decay constant that is sent in should only be due to physical removal (blanket removal + leaching), not radioactive decay. decayremove 43 mol adds the radioactive decay constant itself, so the effect of this is double adding of the radioactive decay constant.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>The variable that is passed to decayremove 43 mol needs to only account for blanket removal and leaching. One option is to remove dlt(m) from the equations that calculate dlt(m) on lines 585 + 583.</p>		
07. Originator: <b>James Welch</b>	Title: <b>Engineer</b>	Date: <b>8-26-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<p>The recommended solution was implemented. A check was made by setting the <del>leach</del> irrigation rate, precipitation rate, and blanket removal rate to zero leaving decay as the only mechanism for radionuclide removal. A plot of the results for the Cm-246 chain is attached. The slope for Cm-246 was checked and it matches a half-life of 4,760 yrs which is correct.</p>		
13. Implemented By: <b>Mark Janssen</b>		Date: <b>9-3-97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <u>PA-SPCR-181</u>		
02. Project Title: <u>TPA Code Testing</u>		20-5708-7622 Project Number:
03. SPCR Title: <u>Correct headers and comment out unused parameters</u>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<u>tpa.inp</u> <u>fail.t.f</u> <u>infenv.f</u> <u>exec.f</u>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<u>Unused parameters in tpa.inp, incorrect headers in x.rlt files, and</u> <u>(tpa.inp)</u> <u>(+infenv.f)</u> <u>incorrect filename printed to ebfail (failt) output file.</u> <u>(exec.f)</u>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<u>Make changes to correct for the above inconsistencies/extra parameters</u>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<u>Implemented as described above</u>		
13. Implemented By: <u>R R V</u>		Date: <u>8/22/97</u>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-180</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7621 Project Number:
03. SPCR Title: <b>Modify reader.f for consist calculation of # Wfs</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>reader.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>Reader.f calculated # Wfs in a way that was inconsistent with similar calculations in the tpa code</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>modify reader.f (1 line) so that # Wfs are consistently calculated in the tpa code.</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as described above.</b>		
13. Implemented By: <b>R. King</b>		Date: <b>8/22/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-179</b>		
02. Project Title: <b>TPA3</b>		Project Number: <b>70-5708-762</b>
03. SPCR Title: <b>Performance Enhancement for 100,000 year runs.</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>VZFT.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>VZFT/nefms runs out of array storage for 100,000 year runs. The array identified in the nefms error message is 'bf'.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>VZFT should not generate an input file for nefms which contains legs with a large difference in velocities. All legs should have an average gwt within 95% of the total average gwt for the sub-area.</p>		
07. Originator: <b>T. M. Carlin</b>	Title:	Date: <b>8-20-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: <b>Janetzke</b>		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<p>A test was added to test the average gwt for each layer to be greater than .05x total average gwt before using it for input to nefms.</p>		
13. Implemented By: <b>Ron Janetzke</b>		Date: <b>8/20/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-178		
02. Project Title: TPA3		20-5708-762 Project Number:
03. SPCR Title: NEFTRAN Size Reduction		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
netmks.f, SIZES.INC		
05. DESCRIPTION OF PROBLEM/CHANGE		
The storage arrays for netmks are declared in SIZES.INC and can be reduced according to Tim McCartin.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The current program size is 110 Mbytes. By changing MXLEG from 25 to 18 and MXMEM from 10 to 5 the size can be reduced to 57.8 Mbytes.		
07. Originator: T. McCartin	Title:	Date: 8-1-97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: Janetzke		Date: 8-19-97
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
Parameters MXLEG + MXMEM were set to 18 + 5 respectively in file SIZES.INC.		
13. Implemented By: R. Janetzke		Date: 8-19-97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-177</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number:
03. SPCR Title: <b>Modify exec.f for time=0 scenario failures written to wpsfiles</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<p>exec.f array.f</p>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>For scenario failures at the 1<sup>st</sup> time (i.e., time=0), the value for #wps disturbed was written to an incorrect time step (the next failure time, instead of @t=0); array.f printed error message for 0 timefirst <math>\rightarrow</math> so <math>\leq</math> timefirst needed to be changed to <math>&lt;</math> timefirst to allow for t=0 scenario failure</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>Modify exec.f to write scenario failures for t=0 cases. (+array.f)</p>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<p>Implemented as described in section 06</p>		
13. Implemented By: <b>R Rio</b>		Date: <b>8/18/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-176</b>		
02. Project Title: <b>IPA Code testing</b>		20-5788-7622 Project Number:
03. SPCR Title: <b>Modify <del>s2fft.f</del>, <del>strmtube.dat</del>, <del>dcagw.f</del> to allow for Critical</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>s2fft.f</b> <b>strmtube.dat</b> <b>dcagw.f</b> <b>dcags.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>NRC requested the capability to assign distance to critical groups other than 5 + 30 km</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>Modify s2fft.f, dcagw.f + dcags.f to read data for critical group distances from strmtube.dat for near field + far field distances</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as described in section 06</b>		
13. Implemented By: <b>R. Ric</b>		Date: <b>8/18/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-175</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number:
03. SPCR Title: <b>Modify exec.f &amp; dcags.f to allow for 43 nuclides (instead of 20)</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>exec.f</b> <b>dcags.f</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<b>43 nuclides were analyzed for ground surface releases, but a different list (20) were considered for groundwater releases and it was necessary to report all 43 for air releases (instead of 20)</b>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<b>modify exec.f &amp; dcags.f for 43 (instead of 20) additional nuclides</b>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<b>Implemented as described above</b>		
13. Implemented By: <b>J.R. Rice</b>		Date: <b>8/16/97</b>



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-174</b>		
02. Project Title: <b>TPA 3</b>		Project Number:
03. SPCR Title: <b>Fault Zone layer for UZFT + SZFT.</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<b>UZFT + SZFT.</b>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>A new layer name was added to The unsaturated zone. The name UFZ_ is used for The Fault Zone properties of sub-area 7. Also, The method of handling non-zero leg lengths was modified. Also, The dispersion field in 'netii.inp' was changed to E Format. Also, a check is made for 'ne</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>The argument list for 'getvertlayers' as well as the routine were revamped to reflect the latest layer names for the unsaturated zone. The argument list for both UZFT + SZFT calls to 'getvertlayers' was changed. The method of obtaining properties for the repository leg was changed to select the first non-zero leg. This will permit the code to pick the Fault zone properties for sub-area 7.</p>		
07. Originator: <b>Janetzke</b>	Title: <b>Analyst</b>	Date: <b>8-15-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<b>see attached 'diff' listing.</b>		
13. Implemented By: <b>Janetzke &amp; Rice</b>		Date: <b>8-15-97</b>

neSnaks  
normal  
termination

sub-area  
7.

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-173</b>		
02. Project Title: <b>TPA3</b>		Project Number:
03. SPCR Title: <b>New path for 'data/x' files.</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
All modules That use files in the data subdirectory		
05. DESCRIPTION OF PROBLEM/CHANGE		
In order to permit users to edit data files locally <del>rather</del> and still access a centrally controlled version of the stand alone codes a separate path is needed for access to the data files.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Include file 'path.i' was changed to add a new variable called 'dpath' which holds the path to the users data subdirectory. All modules which copy files from data <del>into</del> were changed to reflect the new variable name. dcalw, dcalg, ebsfail, ebsrel, findelov, nfenr, szst, vzfrow, +seismo.		
07. Originator: <b>Janetzke</b>	Title: <b>Analyst</b>	Date: <b>8-15-97</b>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
All files were changed as described above.		
13. Implemented By: <b>Janetzke</b>		Date: <b>8-15-97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-172</b>		28
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number:
03. SPCR Title: <b>Modify volcano.f to remove double counting ejected + gw release MTUs</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
volcano.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
The area affected by a cone(ejected) and its dike <sup>was counted</sup> <del>was both</del> as both ejected and available for sw transport.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Eliminate double counting by subtracting the overlap area between cone + dike from the dike area		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in .06		
13. Implemented By:	<b>R. Rie</b>	Date: <b>8/12/97</b>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-171</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7622 Project Number:
03. SPCR Title: <b>Modify uzt.f to determine successful NEFTIRAN completion and set the mixing zone velocity</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
uzt.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
NEFTIRAN was, under data dependent conditions (which were due to mixing zone velocity, for example) terminating without successfully completing the run and the existing error checks for this situation (status) were not detecting these cases		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add an error check to runnefmk within uzt.f and add logic to set the mixing zone velocity equal to the velocity of the 1st non-length leg for that subarea		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
Implemented as described in .06		
13. Implemented By: <b>R. Ric</b>		Date: <b>8/12/97</b>


## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <b>PA-SPCR-170</b>		
02. Project Title: <b>TPA Code Testing</b>		20-5708-7122 Project Number:
03. SPCR Title: <b>Modified wlvu.f to read tabulated data</b>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<p>wlvu.f tpa.inp (tefKti.inp ← new file in ../data subdirectory)</p>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>wlvu.f was <sup>not</sup> <del>modified</del> <sup>setup</sup> to read tabulated temp. &amp; RH data from an external file depending on a switch in the input file (tpa.inp) instead of to calculate values.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>- Modify wlvu.f to read data <del>from</del> from a file          - add flags to tpa.inp file          - add data file (tefKti.inp) to ../data subdirectory</p>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<p>Implemented as described above</p>		
13. Implemented By: <b>R. Ricci</b>	Date: <b>8/12/97</b>	

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-169</i>		
02. Project Title: <i>TPA Code Testing</i>		20-5708-761 Project Number:
03. SPCR Title: <i>Activation of tabular data input</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>nfenv.f , tpa.inp, exec.f.</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>Tabular temperature, RH data input option need to be added.</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>New option was created.</i>		
07. Originator: <i>S. Mohanty</i>	Title:	Date: <i>8/8/97</i>
PROJECT		
08. Need by Date: <i>9/8</i>	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<i>See #6</i>		
13. Implemented By: <i>S. Mohanty</i>		Date: <i>8/8/97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-168		
02. Project Title: 		20-5708-762 Project Number:
03. SPCR Title: TPA Code Development / Testing		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ran.f, sampler.f, array.f, Makefile		
05. DESCRIPTION OF PROBLEM/CHANGE		
Remove constraints from the TPA code that prevents the use of -C option during compilation.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Dynamic array dimensioning was changed with fixed array dimensioning. For example, in array.f, dimension iv(1) was changed to dimension iv(n)		
07. Originator: R. Codell	Title: NRC	Date: 7/7/97
PROJECT		
08. Need by Date: 9/8	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 7/8/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Please see #6. Please see dimension statements in the attached document to see what lines were changed in array.f. Similar changes were done to		
13. Implemented By: Sifakanta Mohanty	Date: 7/8/97	

files specified in #4.

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-167		
02. Project Title: TPA 3.1 code development		Project Number: 20-5708-K2
03. SPCR Title: TPA Code Testing: array dimension problem		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ebsrel.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
-C compilation option revealed that ncon was dimensioned to ncon(10) instead of ncon(16)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
change ncon(10) → ncon(16)		
07. Originator: R. Codehl	Title: NRC	Date: 7/7/97
PROJECT		
08. Need by Date: 9/8/97	09. Approved:	Disapproved:
10. Software Developer: Sitakanta Mohanty et al.	Date: 7/7/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as suggested in #6. This modification had no impact on the results.		
13. Implemented By: Sitakanta Mohanty	Date: 7/8/97	



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-166		
02. Project Title: TPA Code development/Testing	20-5708-762 Project Number:	
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
UZFLOW.F		
05. DESCRIPTION OF PROBLEM/CHANGE		
Infiltration rate too high for certain conditions. See attached input file as an example.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Constraining parameters to be added.		
07. Originator: T. McCartin	Title: NRC	Date: 7/7/97
PROJECT		
08. Need by Date: 9/8/97	09. Approved:	Disapproved:
10. Software Developer: S. Mahanty et al.	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
New conceptual model was brought in. Cubic relationships (with T) was replace with Linear relationships		
13. Implemented By: Stuart Stettinoff & Carol Scherer		Date: 7/10/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-162		
02. Project Title: TPA 3.0 Code development		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
fault.f, elbstailf, elbsrel.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Files temphumd.dat and elbsth.dat are identical, but were created by two different programs. Because of resource allocation problem, we wanted to get rid of one of those files.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Keep elbsth.dat and get rid of temphumd.dat. Change elbsrel.tmp file accordingly.		
07. Originator: S. Mohanty	Title:	Date: 8/5/97
PROJECT		
08. Need by Date: 9/8/97	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 8/1/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
see #6		
13. Implemented By: S. Mohanty		Date: 8/1/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <u>PA-SPCR-161</u>		
02. Project Title: <u>TPA</u>		20-5708-762 Project Number:
03. SPCR Title: <u>VZ FLOW pixel Mapping</u>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<u>vzflow.s</u>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<u>vzflow can produce divide by zero errors and/or NaN values for infiltration.</u>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<u>Modify subroutine mapDEM-to-SAs to correct subscript calculation for 'imap' array.</u>		
07. Originator: <u>A. Janetzke</u>	Title:	Date: <u>7-30-97</u>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: <u>STU STOTHOFF</u>		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<u>subscript arithmetic for variable <u>imap</u> was corrected. To properly map DEM pixels to sub areas in routine <u>reduce-DEM-to-SAs</u>.</u>		
13. Implemented By: <u>Stu Stothoff</u>		Date: <u>7/30/97</u>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <u>RA-SPCR-160</u>		
02. Project Title: <u>TPA Code development / Testing</u>		20-5708-76 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<u>VZFLOW MODULE, SUBROUTINE VZFLOW</u>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<u>MINOR ADJUSTMENT REQUIRED TO TABLE LIMITS <del>TABLE</del> (FUDGE-TAB) TO PROPERLY CAPTURE EXPECTED RANGE OF INITIAL INFILTRATION RATES.</u>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<u>ADDED MORE TABLE DIVISIONS (MNFT INCREASED TO 8) CHANGED LIMITS ON SCALING PARAMETER (FUDGE-MIN LOWERED TO -0.65) (FUDGE-MAX LOWERED TO 0.2)</u>		
07. Originator:	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<u>CHANGED AS PER SEC. 6.</u>		
13. Implemented By: <u>S. Stothoff</u>		Date: <u>8/5/97</u>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-159		
02. Project Title: TPA3		20-5708-762 Project Number:
03. SPCR Title: NEFTIRAN/cadv changes		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
nefms.s.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
see attachment. (9 pages)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
see attachment as described in 5.		
07. Originator: T. McCartin	Title:	Date: 7-18-97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: Ron Janetzke	Date: 7-18-97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
see #06		
13. Implemented By: Ron Janetzke		Date: 7/18/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-158		
02. Project Title: TPA Code Development/Testing 3.1 beta3		20-5708-762 Project Number:
03. SPCR Title: TPA Code Testing 5		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ebsfail		
05. DESCRIPTION OF PROBLEM/CHANGE (Fuel age = 10)		
When the backfill time was made 59 yrs WP won't experience corrosion failure in 10,000 years. But when 58 yrs (Fuel Age = 10), would fail in ~ 50 years.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The temperature at 58.08 yrs is 347.8 in Case II whereas 340.15 at 61.75 yrs in Case I. Therefore, such failure behavior is logical		
07. Originator: J. Weldy	Title:	Date: 8/7/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved: <input checked="" type="checkbox"/>
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
No modification needed		
13. Implemented By: S. Mohanty	Date: 8/7	

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-157		
02. Project Title: TPA Code Development/Testing		20-5708-762 Project Number:
03. SPCR Title: Modify exec.f for headers and units		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f +parameters.dbf (new file)		
05. DESCRIPTION OF PROBLEM/CHANGE		
NRC requested that name as column header in the *.res files (NRC requested output file)		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify exec.f to units header & read TPA.in parameters name from a database file (parameters.dbf) so NRC staff can analyze results using S-1/w		
07. Originator: V. Colten-Bradley Title:		Date: 7/15/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
Implemented as described above		
13. Implemented By: R. Rice		Date: 8/5/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-156</i>		
02. Project Title: <i>TPA Code development / Testing</i>		20-5708-762 Project Number:
03. SPCR Title: <i>EBSREL modification for production determination</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>EBSREL.F</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>indexing of arrays, do loops, and determining diffra c</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>modify indexes for arrays, do loops &amp; read diffra c from tpa.inf</i>		
07. Originator: <i>S. Mohanty</i>	Title:	Date: <i>7/29/97</i>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<i>Implement as shown in #6</i>		
13. Implemented By: <i>TCLic</i>	Date: <i>8/1/97</i>	



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-155</i>		
02. Project Title: <i>TPA</i>		Project Number: <i>20-5704-762</i>
03. SPCR Title: <i>Disclaimer Notice</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>All Fortran files.</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>Add The attached disclaimer To The front of each Fortran file.</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>This satisfies The TOP-18 requirement for code headers.</i>		
07. Originator: <i>S. Mohanty</i>	Title:	Date: <i>8-1-97</i>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: <i>Janet ZKE</i>		Date: <i>8-6-97</i>
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<i>All Fortran files which make up TPA 3.1 beta3 were changed.</i>		
13. Implemented By: <i>Janet ZKE</i>		Date: <i>8-6-97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-154		
02. Project Title: TPA Code		20-5708-762 Project Number:
03. SPCR Title: Incorrect leg lengths		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
NEFMKS.F		
05. DESCRIPTION OF PROBLEM/CHANGE		
see attached.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
see attached.		
07. Originator: J. McCartin	Title: Analyst	Date: 8-4-97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: Janetzke		Date: 8-6-97
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
The indicated change was merged into a previous change of the same line by CSS to use explicit truncation.		
13. Implemented By: Janetzke		Date: 8-6-97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-153		
02. Project Title: TPA3		20-5708-762 Project Number:
03. SPCR Title: correct epasum = 0 in 'writeepacdf'		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
In routine writeepacdf the variable sum is set to zero and not updated.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
change code to update variable written		
07. Originator: Janetzke	Title:	Date: 6-6-97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
See #06		
13. Implemented By: R. Janetzke		Date: 6/13/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-152	
02. Project Title: TPA Code Development	
03. SPCR Title: Modify ebsrelf to initialize "iscon" and "sfine"	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
05. DESCRIPTION OF PROBLEM/CHANGE	
<p>During a tpa run, in cases with no scenario failures for a subarea, values from a previous subarea are used for "iscon" (#WPF failed due to scenario failure) and "sfine" (scenario failure).</p>	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
<p>Initialize "iscon" and "sfine" to 0 and 1000 (corresponding to no WPF failed due to scenario failure).</p>	
07. Originator: J. Wallen	Title: Consultant
Date: 07/1/92	
PROJECT	
08. Need by Date:	09. Approved:
Disapproved:	
10. Software Developer:	Date:
11. Element Manager:	Date:
12. IMPLEMENTED SOLUTION	
<p>Implemented as described above (see attached sheet)</p>	
13. Implemented By: K. Zico	Date: 6/5/92

tpa run failure in the

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-151</i>		
02. Project Title: <i>TPA Code Development</i>		Project Number: <i>20-5708-762</i>
03. SPCR Title: <i>Add a tolerance for a logical statement within subarea.f</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>subarea.f</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>for certain coordinates (subarea), there can be pts. on boundaries which are incorrectly assigned as outside of the subarea → this can cause problems when determining the length of intersection of the segment with a quadrilateral region</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>add the tolerance</i>		
07. Originator: <i>R. Rice</i>	Title: <i>Consultant</i>	Date: <i>5/20/97</i>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<i>implemented as described above (see attached sheet)</i>		
13. Implemented By: <i>R. Rice</i>		Date: <i>6/7/97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <u>RA-SPCR-150</u>		
02. Project Title: <u>TPA Code Development</u>		20-5708-762 Project Number:
03. SPCR Title: <u>Add a parameter for Saturated Zone Dispersion length</u>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<u>s2ft.f</u> <u>tpa.inp</u>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>the sat. and unwt. zone both used a dispersion length that was a fraction of leg (unwt) and path (sat) length; however it was agreed to by NRC &amp; DWR staff that the sat zone should use a Dispersion length unwt. zone fraction of leg length dispersion value</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>add a parameter to tpa.inp and modify s2ft to read and use this new parameter</p>		
07. Originator: <u>R. Janetzke</u>	Title:	Date: <u>6/1/97</u>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<p>implemented as described in section 06 (see attached sheets for modifications)</p>		
13. Implemented By: <u>R. Rico</u>		Date: <u>6/12/97</u>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-149</i>		
02. Project Title: <i>TPA Code Modification</i>		Project Number: <i>20-5708-762</i>
03. SPCR Title: <i>Provide consistent timeofevent determination</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>array.f</i>	<i>eb3fail.f</i> <i>seismo.f</i>	<i>volcano.f</i> <i>faulto.f</i>
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>The modules eb3fail.f, seismo.f, volcano.f, and faulto.f were not consistent in determining timeofevent</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>add a subroutine to array.f and modify the y other codes to utilize this subroutine and provide consistency (among subroutines)</i>		
07. Originator: <i>S. Mohanty</i> Title:		Date: <i>6/10/97</i>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
<i>implemented as described above (see attached sheets for modifications)</i>		
13. Implemented By: <i>Z. R. v</i>		Date: <i>6/14/97</i>

• Modify ~~the~~ distribution of rock categories in TSW2 unit.

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-148		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: <sup>update</sup> Modifications to Seismo-f module		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Seismo-f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<ul style="list-style-type: none"> <li>• Add • change the assumption of rigid supports for a simply supported beam to elastic supports</li> <li>• take into consideration of the effect of joint spacing on the effective falling rock volume that <sup>may</sup> affect the integrity of waste packages</li> </ul>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<ul style="list-style-type: none"> <li>• Reduce the amount of conservatism</li> <li>• <del>fully</del> utilize available site data</li> </ul>		
07. Originator: Simon Hsiung	Title: Principal Engineer	Date: 5/2/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: Simon Hsiung	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
• see 05		
13. Implemented By: Simon Hsiung		Date: 5/10/97

CNWRA Form TOP-5 (03/95)

Sitakanta: please take a look to see if you have any comments  
Thanks  
Simon



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-147		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title:		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tpa.e, nefmhs.e, failt.e, releaset.e, ashplume.e shllhs.e.		
05. DESCRIPTION OF PROBLEM/CHANGE		
COMPILED tpa.e and standalone codes with OPTIMIZATION (-O4). PRODUCED AND SAVED OUTPUT FILES,		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
PERFORMED A "DIFF" OF OPTIMIZED AND NON-OPTIMIZED *.res OUTPUTS. FOUND NO DIFFERENCE, HENCE IT IS SAFE TO USE -O4. <del>PERFORMANCE</del> EXECUTION TIME FOR OPTIMIZED IS .73xNONOPTIMIZED		
07. Originator: A. LOZANO	Title:	Date:
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: A. Lozano	Date: 6/17/97	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
MODIFY Makefiles to use -O4 option.		
13. Implemented By: Albert Lozano		Date: 6/17/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-146		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Move hard coded data out of seismo into a data		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
seismo.f (seismo.dat - new data file in the "data")		
05. DESCRIPTION OF PROBLEM/CHANGE		
Hard coded data (Falling Rock - Volume) in seismo.f		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Move the hard coded data out of seismo.f and into a data file (seismo.dat)		
07. Originator: B. Sofar	Title:	Date: 6/24/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: F. Rub		Date: 6/26/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-145		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Modify excel to write flow rates after reflux on WP basis		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
excel		
05. DESCRIPTION OF PROBLEM/CHANGE		
NRC requested customized output in inf/pptres (4 <sup>th</sup> column) for flow rate after reflux was <del>presented</del> on a subarea basis & NRC staff wanted the values on a WP basis		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify excel. to divide the flow rate by the WP area instead of the subarea area		
07. Originator: T. McCarty	Title:	Date: 6/26/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rie		Date: 6/26/97

TPA Modifications to Controlled Version  
 on - here/tpa623 to ~~wascher/tpa623~~  
 (old) ~~wascher/tpa623~~  
 (R. Rie) (new)

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-144		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Modify for sh() & system() consistency & error traps		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ashplum.o.f ebsfail.f ebsrel.f sampler.f uzt.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
For sh() & system(), there was not consistency in using them + not all had error traps		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Make sh() & system() usage consistent by adding in the same error trap (and since sh() & system() apparently are equivalent for tpa application, make the 2 system(), 2 sh())		
07. Originator: A. Lozano	Title:	Date: 6/25/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above in section 06		
13. Implemented By: R. Rie		Date: 6/26/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-143		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Modify ebsrel.f & ebsrel.tmp for format		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ebsrel.f ebsrel.tmp		
05. DESCRIPTION OF PROBLEM/CHANGE		
release.f modifications (as part of ebspac) included changing the format of the ebsrel input file		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
modify the writer in ebsrel.f and the format of the ebsrel. template file		
07. Originator: S. Mohanty	Title:	Date: 6/18/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implementer as described above (see attached sheets)		
13. Implemented By: TCR		Date: 6/18/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-142		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Modify codes for consistent screen print (and to files)		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f ebsrel.f ebsail.f utfft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
inconsistent screen print and extra info. printed to screen (format) during a tpa run; also inconsistent internal to exec.f) determination of spacedf results		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
modify codes as described above		
07. Originator: R. Baca	Title:	Date: 6/23/92
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as provided in sections 05 & 06 above		
13. Implemented By: Fu Ric		Date: 6/23/92

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-141		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Provide more descriptive names for tpa.inp parameters		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
tpa.inp    47ft.f    ebsrel.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
modified names of tpa.inp parameters to be more descriptive (i.e., Reproduction Factor - Cm → RD-backfill - Cm) and for units (i.e., <del>KD</del> Matrix KD - LAF - U → Matrix KD - LAF - U [m <sup>3</sup> /kg])		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
modified the 3 codes (change names)		
07. Originator: V. Colten-Bradley	Title:	Date: 8/23/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above		
13. Implemented By: R. Ricci		Date: 8/23/97

TPA Modifications to controlled version  
 on ~cscherer/tpa618 to ~cscherer/tpa623  
 (all) (new)  
 (R. Rice)

SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-140		
02. Project Title: TPA Code Development		20-570P-762 Project Number:
03. SPCR Title: Modify exec for printing only sampled parameters & header file		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
NRC requested output consisted of sampled parameters (not all tpa.inp parameters) and a header file w/ the names sampled parameters		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
modify exec to write only sampled parameters (i.e., non-constants) and to write these names to a header file		
07. Originator: T. McCaslin	Title: NRC	Date: 6/23/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:		Date:
11. Element Manager:		Date:
12. IMPLEMENTED SOLUTION		
implemented as described in Sect. 06		
13. Implemented By: R. Rice		Date: 6/23/97



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-139	
02. Project Title:	Project Number:
03. SPCR Title: Providing Customized Output for TPA code	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
exec.f      4zft.f 5zft.f      1cagw.f	
05. DESCRIPTION OF PROBLEM/CHANGE	
Based on NRC requests, modifications to the above files were performed to write info/results to files	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
NRC requested these "customized outputs" for their analyzer (S-Plus based) in a format specific to their analysis tool	
07. Originator: V. Golden-Bradley	Title: NRC
Date: 6/14/97	
PROJECT	
08. Need by Date:	09. Approved:
Disapproved:	
10. Software Developer:	Date:
11. Element Manager:	Date:
12. IMPLEMENTED SOLUTION	
Implemented as described above	
13. Implemented By: R. Rice	Date: 6/16/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number:			PA-SPCR-138		
02. Project Title:			Project Number:		
03. SPCR Title: Providing streamtube data for szft					
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION					
szft.f (szft.i - new include file)      exec.f (streamtube.dat - new data file) tpa.inp					
05. DESCRIPTION OF PROBLEM/CHANGE					
Instead of reading sat-zone lengths, widths, etc in tpa.inp, read this info from a data file (including material types); Also, cleanup code by removing/modifying comments (also <sup>changed</sup> removed upper case to lower case)					
06. PROBLEM SOLUTION/NEED FOR CHANGE					
Modify szft to read streamtube.dat file & "cleanup" code (comments); remove/add parameters to tpa.inp; add new include file (szft.i); modify calls in exec.f					
07. Originator: G. Wittmeyer		Title:		Date: 6/14/97	
PROJECT					
08. Need by Date:		09. Approved:		Disapproved:	
10. Software Developer:				Date:	
11. Element Manager:				Date:	
12. IMPLEMENTED SOLUTION					
implemented as described above					
13. Implemented By: K. Rice				Date: 6/16/97	

TPA in fixation in  
~cscherer/tpa618  
(P. Ricu)

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-137		
02. Project Title:		20-5708-762 Project Number:
03. SPCR Title: Providing dilution volume based on Critical Group/uz flow		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
dcagw.f tpa.inp		
05. DESCRIPTION OF PROBLEM/CHANGE		
Need to base dilution volume on distance to critical group (5 or 30 km) with a lower limit of the being the average uz flow		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify dcagw.f to determine dilution volume based on distance to critical group and insert logic to select the largest volume (either pump rate, volume based on flow rate + mixing depth, or uz flow); add parameters to tpa.inp		
07. Originator: T. McCaslin	Title: NRC	Date: 6/14/97
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
Implemented as described above		
13. Implemented By: R. Ricu		Date: 6/16/97


## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-136</i>		
02. Project Title:		20-5708-762 Project Number:
03. SPCR Title: <i>Modify exec.f to add headers to NRC customized output files</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>exec.f</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>NRC requested headers (col1, col2, col3, etc.) in their customized output files; also needed appropriate header to meet TOP-18 requirements</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>modify exec.f to print this header information into all *.res (and *.hdr) files</i>		
07. Originator: <i>S. Mohanty</i>	Title:	Date: <i>7/21/97</i>
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<i>implemented as described in section 06</i>		
13. Implemented By: <i>R. Ric</i>		Date: <i>7/22/97</i>

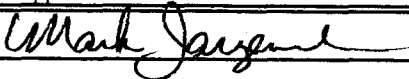
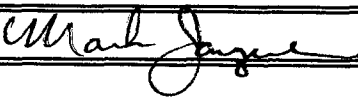
## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <u>AA-SPCR-135</u>		
02. Project Title: <u>TPA</u>		<u>20-5708-762</u> Project Number:
03. SPCR Title: <u>NEFTRAN Velocity Control Input Parameter</u>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<u>UZF.T.F</u>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<u>Add an input parameter to UZF.T to permit the user to control the rate of change of velocities in the nefmks variable velocity file (NEFII.VEL).</u>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<u>This will create a smaller velocity file and result in decreased nefmks execution time.</u>		
07. Originator: <u>J. McCartin</u>	Title: <u>NRC</u>	Date: <u>6-10-97</u>
PROJECT		
08. Need by Date: <u>9/8/97</u>	09. Approved:	Disapproved:
10. Software Developer:	Date:	
11. Element Manager:	Date:	
12. IMPLEMENTED SOLUTION		
<u>See #06</u>		
13. Implemented By: <u>R. Janetzke</u>		Date: <u>6/10/97</u>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-134		
02. Project Title: TPA Code Development	20-5708-762 Project Number:	
03. SPCR Title: Compute correct water volume in the Waste Package		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
reaset.f $\equiv$ ebaspac_release.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Equation used in this module should use $\tan(\theta)$ instead of $\tan(\theta/2)$ .		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Change $\tan(\theta/2)$ to $\tan(\theta)$ [Line 493 in ebaspac_release.f]		
07. Originator: S. Mohanty	Title: Sr. Res. Scientist	Date: 6/18/97
PROJECT		
08. Need by Date: 6/18/97	09. Approved:	Disapproved:
10. Software Developer: S. Mohanty	Date: 6/18/97	
11. Element Manager: RG Baea	Date: 6/23/97	
12. IMPLEMENTED SOLUTION		
This change was implemented as shown in #6. This change <u>does not</u> affect the results presented in EBSPAC1.1 report.		
13. Implemented By: 	(Sitakanta Mohanty)	Date: 6/18/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR- <del>XXX</del> /334		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Modification of the DCAGW Module based on the 5/30/97 NRC/CNWRA staff meeting		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. Module DCAGW.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Similar to the changes made to the DCAGS module, the DCAGW module is being revised to have the dose conversion factors located in input data files.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
1. The dose conversion factors are now in lookup tables. These tables are input data files entitled; gw_cb_ci.in, gw_pb_ci.in, gw_cb_ad.in and gw_pb_ad.in. The filenames were limited to eight characters '.' three characters for future use in a PC version of the code. The acronyms in the title are 'gw' for groundwater pathway, 'cb' for current biosphere 'pb' for pluvial biosphere, 'ci' for closer in residential water user, and 'ad' for amargosa desert farmer rancher. Also, the input data are dcf's by pathway, not just the total pathway dcf's.		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 6/5/97
PROJECT		
08. Need by Date: 6/5/97	09. Approved:	Disapproved:
10. Software Developer: Mark Jarzempa		Date: 6/5/97
11. Element Manager:		Date: 6/5/97
12. IMPLEMENTED SOLUTION		
See the attachments for the implemented solution.		
13. Implemented By: Mark Jarzempa		Date: 6/5/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: UZFLOW-001 / PA-SPCR-133		
02. Project Title: sh() needs to be typed as integer		20-5708-762 Project Number:
03. SPCR Title: sh() usage in subroutines climate_init() and uzflow_init() in file uzflow.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also SPCR's VOL-001, NFENV-001, UTIL-001, SZFT-001, UZFT-002 and the first page. For this SPCR, the affected software is subroutines climate_init() and uzflow_init() found in file uzflow.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Default implicit typing is used. sh() used at l 253 and l 262 (subroutine climate_init() ). sh() also used at l 942 and l 971 (subroutine uzflow_init() ).		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type sh as integer after l 234 and before l 247, and after l 924 and before l 929.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: 5/2/97
PROJECT		
08. Need by Date: 8/2/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 5/2/97	
11. Element Manager: RGP	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
For Study check caught these errors before this SPCR was prepared		
13. Implemented By: Sitakanta Mohanty	Date: 7/5/97	



## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: SZFT-001 / PA-SPCR-132		
02. Project Title: sh() needs to be typed as integer		20-5708-762 Project Number:
03. SPCR Title: sh() usage in file szft.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also SPCR's VOL-001, NFENV-001, UTIL-001., UZFLOW-001, UZFT-002 and the first page. For this SPCR, the affected software is found in szft.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
sh() used at ll 125, 129,134,138,143, and 147 (subroutine szft). Implicitly typed as double precision at l 35.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type sh as integer after l 35 and before l 39.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: 5/2/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 5/2/97	
11. Element Manager: RGP/Baro	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
For Study test had caught these errors		
13. Implemented By: Sitakanta Mohanty	Date: 6/7/97	

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: NFENV-001 / PA-SPCR-131		
02. Project Title: sh() needs to be typed as integer		20-5708-762 Project Number:
03. SPCR Title: sh() usage in nfenv.abacus.f and nfenv.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also SPCR's VOL-001, UTIL-001, UZFLOW-001, UZFT-002 and the first page. For this SPCR, the affected software is in nfenv.abacus.f and nfenv.f.		
05. DESCRIPTION OF PROBLEM/CHANGE		
sh() used while implicitly typed as double precision at l 94 of nfenv.abacus.f and at l 119 of nfenv.f.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type sh() after l 40 and before l 57 of nfenv.abacus.f. Explicitly type sh() after l 37 and before l 57 of nfenv.f.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: 5/2/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: Sitakanta Mohanty	Date: 5/2/97	
11. Element Manager: RGP	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
For - Study had caught these errors and changes were made by the time the SPCR was written.		
13. Implemented By: Sitakanta Mohanty	Date: 6/7/97	

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: UTIL-001 / PA-SPCR-130		
02. Project Title: sh() needs to be typed as integer		20-5702-76 Project Number: 2
03. SPCR Title: sh() usage in subroutine newrealization of sampler.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also SPCR's VOL-001, NFENV-001, SZFT-001, UZFLOW-001, UZFT-002 and the first page. For this SPCR, the affected software is subroutine newrealization found in file sampler.f.		
05. DESCRIPTION OF PROBLEM/CHANGE		
sh() used at l 662 while implicitly typed as double precision.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type as integer after l 595 and before l 625		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: 5/2/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RCB	Disapproved:
10. Software Developer: S. Mohanty et al	Date: 5/2/97	
11. Element Manager: RCB/Baca	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
See SPCR# 129		
13. Implemented By: Bifalanka Mohanty	Date: 6/7/97	

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: VOL-001 / <i>PA-SPCR-129</i>		
02. Project Title: sh() needs to be typed as integer		20-5708-712 Project Number:
03. SPCR Title: sh() usage in subroutines ashplumo() and ashplume()		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
see also SPCR's NFENV-001, UTIL-001, SZFT-001, UZFLOW-001, UZFT-002 and the first page. For this SPCR, the affected software is subroutines ashplumo() and ashplume() found in file ashplumo.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
sh() used (in ashplumo()) while implicitly typed as double precision at l 20 and again (in ashplume()) at l 311		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type sh as integer after l 7 and before l 15. Explicitly type sh as integer after l 222 and before l 231.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: 5/1/97
PROJECT		
08. Need by Date: <i>8/8/97</i>	09. Approved: <i>RFB</i>	Disapproved:
10. Software Developer: <i>S. Mohanty et al.</i>		Date: <i>5/2/97</i>
11. Element Manager: <i>RG Bala</i>		Date: <i>6/5/97</i>
12. IMPLEMENTED SOLUTION		
<i>See PA-SPCR-128</i>		
13. Implemented By: <i>Sitakanta Mohanty</i>		Date: <i>6/7/97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: SAMP-001 / PA-SPCR-128		
02. Project Title: system() needs to be typed as integer		20-5708-762 Project Number:
03. SPCR Title: system() usage in sampler.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also first page and SPCR UZFT-002. For this SPCR, the affected software is sampler.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
In subroutine newrealization(), system() is used while implicitly typed as double precision and then set to an integer variable. See first page for why this is a problem. This occurs at l 693		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type system as integer after l 595 and before l 599.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: May 6, 1997
PROJECT		
08. Need by Date: 8/8/97	09. Approved: <input checked="" type="checkbox"/>	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 5/6/97	
11. Element Manager: K. A. McComick	Date: 5/6/97	
12. IMPLEMENTED SOLUTION		
Problem was eliminated during the implementation of For-Study.		
13. Implemented By: Sitakanta Mohanty	Date: 5/6/97	

CNWRA Form TOP-5 (03/95)

cc: Tim McLanin

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: UZFT-002 / PA-SPCR-127		
02. Project Title: system() needs to be typed as integer		20-5708-762 Project Number:
03. SPCR Title: system() usage in uzft.f		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
See also first page and SPCR SAMP-001. For this SPCR, the affected software is uzft.f.		
05. DESCRIPTION OF PROBLEM/CHANGE		
In file uzft.f, system() is used while implicitly typed as double precision and then set to an integer variable. See first page for why this is a problem. This occurs at l 1169 and l2681.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Explicitly type system as integer after l 243 and before l 248.		
07. Originator: M. Rose Byrne	Title: Sys. Perf. Anal. (Hydrology)	Date: May 6, 1997
PROJECT		
08. Need by Date: 8/8/97	09. Approved: <input checked="" type="checkbox"/>	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: May 6, 1997	
11. Element Manager: Keith J. McConnell	Date: 5/6/97	
12. IMPLEMENTED SOLUTION		
FOR-Study implemented had caught this error. Changes were made during For-Study.		
13. Implemented By: Sitakanta Mohanty	Date: 5/6/97	

CNWRA Form TOP-5 (03/95)

cc: Tim McConnell

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-126		
02. Project Title: TPA 3.0		20-5708-762 Project Number:
03. SPCR Title: Correct the mechanical failure module		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
fault.f (i.e. elaspac-fault.f) of EBSPAC.		
05. DESCRIPTION OF PROBLEM/CHANGE		
The <del>inter</del> linear interpolation in function subprogram yfunc is not done correctly.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify $yfunc = (x_{top} - a_{low}) / (a_{top} - a_{low}) * (yy(i) - yy(i-1))$ to do correct interpolation		
07. Originator: S. Mohanty	Title: Sr. Res. Sci	Date: 2/4/97
PROJECT		
08. Need by Date: 3/17/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 2/4/97	
11. Element Manager: RGP/zaee	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
Modified as described in #06		
13. Implemented By: Sitakanta Mohanty		Date: 2/8/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-125		
02. Project Title: TPA 3.0		20-5708-262 Project Number:
03. SPCR Title: Modify path.i file while installing		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
path.i		
05. DESCRIPTION OF PROBLEM/CHANGE		
TPA 3.0 code requires that path.i file is modified to make the code run properly after installation. The new path is computer and directory specific		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Please see #12		
07. Originator: S. Mohanty	Title: Sr. Res. Sci.	Date: 3/30/97
PROJECT		
08. Need by Date: 4/30/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 3/30/97	
11. Element Manager: RGP/Baca	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
For installation of the code on the NRC computer use path ~nmss28/tjm3/tpa. Required changes to directory names as follows		
13. Implemented By: Sitakanta Mohanty	Date: 4/2/97	

CNWRA Form TOP-5 (03/95)

stand alone codes —→ Codes  
datafiles —→ data



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-124		
02. Project Title: TPA code development		20-5708-762 Project Number:
03. SPCR Title: Incorporate a new mechanical Failure model		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Modi subroutine mech fault.f (elbpac - fault.f in EBSPAC)		
05. DESCRIPTION OF PROBLEM/CHANGE		
The existing mechanical failure is not suitable for the current conceptualization of WP		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modify the existing mechanical failure module.		
07. Originator: Grayolino	Title: Staff Scientist	Date: 2/4/97
PROJECT		
08. Need by Date: 3/17/97	09. Approved: RGB	Disapproved:
10. Software Developer: S. Mohanty	Date: 2/4/97	
11. Element Manager: RGB/area	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
The changes affected modules mech, function subprogram yfunc in fault.f.		
13. Implemented By: Sitakanta Mohanty		Date: 2/16/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR- <del>102</del> <b>123</b> <i>LH 6-11-97</i>		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Change of a units conversion error in ASHRMOVO Module		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. ashrmovo.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>Page 10, line 52 of the current module (attachment A):: The units conversion constant at the end of this line (1.0d-4) incorrectly converts (rem/yr)/(Ci/cm<sup>2</sup>) to (rem/yr)/(Ci/m<sup>2</sup>). The correct conversion constant should be 1.0d+4. This change should be made by commenting out lines 51 and 52, and replacing them with lines 49 and 50 as shown on the attachment.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
This error results in the underprediction of doses from the extrusive volcanism scenario by eight orders of magnitude.		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 5/14/97
PROJECT		
08. Need by Date: 6/1/97	09. Approved: <i>RG Baeza</i>	Disapproved:
10. Software Developer: <i>S. Mohanty</i>	<i>et. al.</i>	Date: <i>5/14/97</i>
11. Element Manager: <i>RG Baeza</i>		Date: <i>5/14/97</i>
12. IMPLEMENTED SOLUTION		
<i>See #06</i>		
13. Implemented By: <i>Mark Jarzempa</i>		Date: <i>5/14/97</i>

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-122		
02. Project Title: TPA Code Development	20-5784-762 Project Number:	
03. SPCR Title: NEFMKS Units For Time Dependent Velocities		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
nefmks. f		
05. DESCRIPTION OF PROBLEM/CHANGE		
'tdrel' is ft/yr.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
convert 'tdrel' from ft/yr to m/yr. Line 8059.		
07. Originator: Janetzke	Title: Analyst.	Date: 5-19-97
PROJECT		
08. Need by Date: 8/1/97	09. Approved: RJB	Disapproved:
10. Software Developer: S-Mohanty et al.	Date: 5/19/97	
11. Element Manager: RJB	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
See #06		
13. Implemented By: Ron Janetzke		Date: 6/5/97

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-121		
02. Project Title: TPA3		20-5708-762 Project Number:
03. SPCR Title: Add input parameter TO VZFT.		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
VZFT.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
Add an input parameter to VZFT.f which will permit the user to select the <del>the</del> $\Delta v$ Threshold value for flow velocity Time Steps.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Add a new <del>new</del> module variable TO The input file tpaoinp.		
07. Originator: Janetzke	Title: Analyst	Date: 5-29-97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 5/29/97	
11. Element Manager: RGP	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
See #06		
13. Implemented By: Ron Janetzke		Date: 6/5/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-120		
02. Project Title: TPA 3 Code Development		20-5708-762 Project Number:
03. SPCR Title: Post Processing Data Analysis for CCPF's.		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
TPAPP		
05. DESCRIPTION OF PROBLEM/CHANGE		
create a program which will compile a composite ccpf from 8 individual scenario ccpf's.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Borrow from Phase 2.		
07. Originator: Sagar	Title: Technical Director	Date: 5-29-97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 5/29/97	
11. Element Manager: RGP	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
See #06 (New file/auxiliary code lccdf.f was created)		
13. Implemented By: Ron Janetzke		Date: 6/5/97

CNWRA Form TOP-5 (03/95)

Ron 2 days for Ron to implement

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR- <del>XXX</del> <b>119</b> <i>HS 6-11-97</i>		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Modification of Module DCAGS.f to Allow for A Set of Pluvial Biosphere DCF's		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. Module DCAGS (attached)		
05. DESCRIPTION OF PROBLEM/CHANGE		
At the request of Mr. Tim McCartin of the NRC, the DCAGS code module is being revised to allow for using a different set of dose conversion factors for a pluvial biosphere. The rationale for deciding which set of DCF's to use is documented in Scientific Notebook No. 221 and is based on the values of mean annual precipitation in inches (MAP) and mean annual temperature in degrees F (MAT).		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The number of DCF's in the code has effectively doubled to accommodate this change. At this time, the DCF values for a pluvial biosphere have not been calculated so the values of the DCF's are the same, regardless of the biosphere being modeled with the exception that the pluvial DCF's have a small fraction added to them to allow for testing.		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 5/23/97
PROJECT		
08. Need by Date: 6/1/97	09. Approved: <i>RG</i>	Disapproved:
10. Software Developer: Mark Jarzempa		Date: 5/23/97
11. Element Manager: <i>RG Beco</i>		Date: 5/23/97
12. IMPLEMENTED SOLUTION		
<p>Itemized solutions:</p> <p>p. 1 line 5: dMAT and dMAP added to the call statement.</p> <p>p. 2. line 22: dKGBoundary definition added, based on modeling described in Scientific Notebook 221.</p> <p>p. 3. line 31 through p.4 line 17: DCF's for the pluvial biosphere for the closer in water user added here.</p> <p>p. 5 line 28 through p. 6 line 14: DCF's for the pluvial biosphere for the Amargosa Desert Farmer Rancher added here.</p>		
13. Implemented By: Mark Jarzempa <i>Mark Jarzempa</i>		Date: 5/23/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR- <del>xxx</del> 118 AH 6-11-97		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Modification of Module DCAGW.f to Allow for A Set of Pluvial Biosphere DCF's		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. Module DCAGW (attached)		
05. DESCRIPTION OF PROBLEM/CHANGE		
Similar to the requested modifications to the DCAGS module, the DCAGW code module is being revised to allow for using a different set of dose conversion factors for a pluvial biosphere. The rationale for deciding which set of DCF's to use is documented in Scientific Notebook No. 221 and is based on the values of mean annual precipitation in inches (MAP) and mean annual temperature in degrees F (MAT).		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
The number of DCF's in the code has effectively doubled to accommodate this change. At this time, the DCF values for a pluvial biosphere have not been calculated so the values of the DCF's are the same, regardless of the biosphere being modeled with the exception that the pluvial DCF's have a small fraction added to them to allow for testing.		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 5/23/97
PROJECT		
08. Need by Date: 6/1/97	09. Approved: <i>RG Baer</i>	Disapproved:
10. Software Developer: Mark Jarzempa		Date: 5/23/97
11. Element Manager: <i>RG Baer</i>		Date: 5/23/97
12. IMPLEMENTED SOLUTION		
<p>Itemized solutions:</p> <p>p. 1 line 4: dMAT and dMAP added to the call statement.</p> <p>p. 3. line 8: dKGboundary definition added, based on modeling described in Scientific Notebook 221.</p> <p>p. 4. line 28 through p.5 line 14: DCF's for the pluvial biosphere for the closer in water user added here.</p> <p>p. 6 line 26 through p. 7 line 12: DCF's for the pluvial biosphere for the Amargosa Desert Farmer Rancher added here.</p>		
13. Implemented By: Mark Jarzempa <i>Mark Jarzempa</i>		Date: 5/23/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-XXX <b>117</b> <i>11-91</i>	
02. Project Title: TSPA&I Code Development	20-5708-762
03. SPCR Title: Change of The P(z,rho) Function Subroutine and the Integration Accuracy Parameters in the ASHPLUME code	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
1. ASHPLUME code <i>Ashplume f</i> 2. ASHPLUME Version 1.0 - A code for Contaminated Ash Dispersal and Deposition; Technical Description and User's Guide	
05. DESCRIPTION OF PROBLEM/CHANGE	
<p>The formulation for the probability density function for particle diffusion out of the eruption column as a function of height (z) and particle log-diameter (rho) as found in Suzuki (1983) becomes negative at heights approaching the top of the column. The formulation in Suzuki (1983) is as follows:</p> $P(z,\rho) = A \cdot Y(z,\rho) \exp[-Y(z,\rho)] \quad (1)$ <p>where:</p> <p><math>A = \beta W_0 / (V_0 H (1 - (1 + Y_0) \exp(-Y_0)))</math>  <math>W_0</math> = The eruption velocity at height <math>z=0</math> <i>cm/s</i>  <math>V_0</math> = the particle terminal velocity at sea level (a function of rho) <i>cm/s</i>  <math>H</math> = The height of the eruption column <i>km</i>  <math>Y(z,\rho) = \beta (W(z) - V_0) / V_0</math>  <math>\beta</math> = A constant determining the fan shape of the column  <math>W(z)</math> = The particle velocity as a function of height = <math>W_0(1 - z/H)</math> <i>cm/s</i>  <math>Y_0 = Y(z=0,\rho)</math></p> <p>The normalization constant A is found by integrating the probability density function over all heights and setting the integral equal to one. The problem is that using equation (1) and performing this procedure does not yield the value of A above. Also, <math>P(z=h,\rho)</math> is negative which is fundamentally incorrect. The above formulation, however, does work if <math>Y(z,\rho)</math> is equal to <math>\beta(W(z))/V_0</math>, i.e. <math>P(z,\rho)</math> is universally positive, and the definition of A above is correct.</p> <p>Another problem identified is that the code requires a significant amount of runtime to complete its calculations. The numerical integration routines have accuracy parameters associated with them. By choosing these parameters more judiciously than was done when the code was developed, improvements in runtime can be realized with little sacrifice of accuracy in the calculated values of ash and fuel deposition. For the gaussian-quadrature routine, this parameter is "n". For the romberg integration routines, this parameter is "eps".</p> <p>REFERENCE</p> <p>Suzuki, T. 1983. <i>A Theoretical Model for Dispersion of Tephra</i>. Terra Scientific Publishing Company. Tokyo, Japan.</p>	



## Attachment A

```

ccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
c
c
Program ashplume
c
This program calculates the ash and fuel areal mass density
at the x,y points on the earth's surface. The user is given
the option of recording particulate size distribution
information if so desired
c
Written by: Mark S. Jarzempa, 1/22/97 (this version)
c
ccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
c
maxd = maximum dimension of isopach points
nmy = maximum number of volcanoes
c
parameter (maxd=500)
parameter (nmy=1000)
implicit double precision (a-h,o-z)
implicit integer (i-n)
character*60 version,title
common /one/ beta,q,ashdenmin,ashdenmax,dmean,dsigma,fshape
common /two/ h,wertpt0,airden,airvis,c,u
common /three/ fdmin,fdmax,fdmean,hmin,hmax,xmin,xmax
common /threel/ dmin,dmax,rhomin,rhox,max,rhomean
common /four/ ymin,ymax,acutoff
common /five/ x,y,udir,frhomin,frhomax,frhomean,drho,cmax
common /six/ numptsx,numptyy
common /seven/ Uran
common /eight/ rhocut
common /nine/ v,icount
common /eleven/ ashrholow,ashrhohi
common /twelve/ power,tcur
common /thirteen/ numapts
common /fifteen/ ipchar
common /sixteen/ title
dimension v(10000),xash(maxd,maxd),xfuel(maxd,maxd)
open(unit=10,file='ashplume.out',status='unknown')
version='ASHPLUME version 1.0'
c
Uran = amount of waste extruded (1 container ~ 10MTU)
icount = a counter for the string of random numbers
stored in v
iseed = the random number seed
max = the number of random numbers to get- 8 random nos.
per realization
numapts = the number of particle sizes to use in the histogram
of particle size at the dose pt.
c
icount=1
iseed=10
numapts=30
write (10,*)'iseed= ',iseed
write (10,*) version
max=10000

```

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-116		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Introduce new factors to replace funnel factor		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
TPA 3.0 code		
05. DESCRIPTION OF PROBLEM/CHANGE		
Dick Codell introduced new and more realistic funnel factors → fow, fmult, fdivert		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Move all funnel-related parameters from nfenv.f and introduce to releaset.f. Now fow represents funnel/sawetface → funnel/fret which is specified as one parameter fow. fmult is also introduced as a multiplier.		
07. Originator: Codell	Title: NRC	Date: 5/21/97
PROJECT		
08. Need by Date: 5/30	09. Approved: RGP	Disapproved:
10. Software Developer: Sitakanta Mohanty et.al.	Date: 5/21/97	
11. Element Manager: RGP Bara	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
The first line in the code where qin occurred as a program line was modified as described above.		
13. Implemented By: Sitakanta Mohanty		Date: 6/4

# CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

## TECHNICAL OPERATING PROCEDURE

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### SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-115		
02. Project Title: TPA 3.1 Code development		Project Number: 20-5708-762
03. SPCR Title: Change $\text{CCO}_3$ in ebsrel to $\text{xlcco}_3 = \text{alog}_{10}(\text{cco}_3)$		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
Modules affected: releast.f, ebsrel.f, tpa.inp		
05. DESCRIPTION OF PROBLEM/CHANGE		
R. Codell suggested that we change directly read $\text{alog}_{10}(\text{cco}_3)$ from the input file instead of $\text{cco}_3$ (i.e. carbonate conc.) for the leaching model 1 to facilitate sampling from a log uniform distribution		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
changes made as requested		
07. Originator: R. Codell	Title: NRC	Date: 5/20/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RCB	Disapproved:
10. Software Developer: S. Mohanty	Date: 5/21/97	
11. Element Manager: R. Baca	Date: 6/4/97	
12. IMPLEMENTED SOLUTION		
Changes made as requested.		
13. Implemented By: S. Mohanty		Date: 5/21/97

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Figure B-1. Software Problem/Change Report

Note:  $-\log[\text{CCO}_3]$  was assigned instead of

CNWS Form TOP-2  $\log[\text{CCO}_3]$  to make it consistent with  $\text{pH} \equiv -\log[\text{H}^+]$

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-114	
02. Project Title: TPA 3.0 Code Development	Project Number: 20-5708-762
03. SPCR Title: Build Humid-Air Corrosion Option	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION tpa.inp, elsfail.f, fail.f.	
05. DESCRIPTION OF PROBLEM/CHANGE Incorporate humid air corrosion option in fail.f.	
06. PROBLEM SOLUTION/NEED FOR CHANGE New capability required per agreement with the NRC staff. See meeting summary on humid air corrosion.	
07. Originator: Mohanty	Title: III Date: 5/20/97
PROJECT	
08. Need by Date: 8/8/97	09. Approved: RS/B
Disapproved:	
10. Software Developer: S. Mohanty, et. al.	Date: 5/20/97
11. Element Manager: RS/B	Date: 6/4/97
12. IMPLEMENTED SOLUTION	
13. Implemented By: Sotomonte, Mohanty Date: 6/9/97	

A new if-then-else was added, a new parameter was introduced to represent humid-air corrosion rate & first computation was only used.

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-113		
02. Project Title: TPA 3.0 Code Development		20-5708-762 Project Number:
03. SPCR Title: Change faulto.f for using the width of NW faults		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
faulto.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
widths for NW faults were not utilized within faulto.f		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
solution was to add a line of code for setting NW faulto width		
07. Originator: S. Mohanty	Title: PI	Date: 4/17/97
PROJECT		
08. Need by Date:	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/17/97	
11. Element Manager: RGP/Baca	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06		
13. Implemented By: R. Rice		Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-112		
02. Project Title: TPA 3.0 Code Development		Project Number:
03. SPCR Title: Remove <sup>duplicate and</sup> unused parameters from consequence modules and tpa.inp		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
fault.f      nenv.f      tpa.inp exec.f      volcano.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
'tpa.inp' parameters were specified within consequence modules, but not used, or there were duplicate parameters; also needed to specify 7 subareas instead of 1 within tpa.inp		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
verified that 'tpa.inp' parameters in consequence modules were not needed and then commented them out in the consequence module and/or tpa.inp; commented out duplicate parameters within tpa.inp; and implemented 7 subarea coordinates within tpa.inp		
07. Originator: S. Mohanty	Title: PI	Date: 4/21/97
PROJECT		
08. Need by Date:	09. Approved: RG/B	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/21/97	
11. Element Manager: RG/B	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06		
13. Implemented By: R. Ricci		Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: <i>PA-SPCR-III</i>		
02. Project Title: <i>TPA Code Development</i>	20-5708-762 Project Number:	
03. SPCR Title: <i>change implementation of "maplist" within consequence modules</i>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
<i>faulto.f volcano.f elbsrel.f</i>		
05. DESCRIPTION OF PROBLEM/CHANGE		
<i>inconsistent values returned to the exec for WP failure times (as seen in the fraction of wps failed) array</i>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<i>solution was to make consistent values for the 4 maplist points (order pairs) as specified within faulto.f, volcano.f, and elbsrel.f</i>		
07. Originator: <i>R. Rice</i>	Title: <i>Consultant</i>	Date: <i>5/5/97</i>
PROJECT		
08. Need by Date: <i>8/8/97</i>	09. Approved: <i>RGB</i>	Disapproved:
10. Software Developer: <i>S. Mohanty et al.</i>	Date: <i>5/5/97</i>	
11. Element Manager: <i>RGB</i>	Date: <i>6/5/97</i>	
12. IMPLEMENTED SOLUTION		
<i>implemented as described in section 01</i>		
13. Implemented By: <i>R. Rice</i>		Date: <i>5/20/97</i>

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-110		
02. Project Title: TPA 3.0 Code Development		20-5708-762 Project Number:
03. SPCR Title: Change ebsrel.f to read 'training' values and write to its template		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
ebsrel.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
the ebsrel.f template ('ebspac.nuc') contained retardation factors that were hard coded (and not overwritable) and it was preferable to use RDS in 'training' instead of these hard coded (template) values		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
solution involved requesting a value for the RDS within ebsrel.f and then overwriting the template value		
07. Originator: McCartin	Title: NRC	Date: 4/15/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RFB	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 4/15/97	
11. Element Manager: RG Baco	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06		
13. Implemented By: R. Rice		Date: 5/29/97



# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-109		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Change code to write to a file the number of times a value is requested for a 'tpa.inp' parameter for every realization		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f sampler.f sampler.i		
05. DESCRIPTION OF PROBLEM/CHANGE		
There was a need to determine whether 'tpa.inp' parameters were used during a run		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Solution was to create a file ('spgwers.tpa') which wrote the number of times a value was requested for a 'tpa.inp' parameter during a realization		
07. Originator: Mohanty	Title: PI	Date: 4/15/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 4/15/97	
11. Element Manager: RGP/Baca	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 01		
13. Implemented By: R. Rice		Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-108		
02. Project Title: TPA Code Development		20-5708-762 Project Number:
03. SPCR Title: Change 'sft.f' to read streamtube information		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
sft.f tpa.inp		
05. DESCRIPTION OF PROBLEM/CHANGE		
Saturated zone streamtube information (widths, lengths, flowrates, and layer names) and a mechanism for utilizing and reading this information with 'sft.f' to write the NEPTAN input file was not available.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Build mechanism to utilize and read information on saturated zone streamtube so that input can be written for NEPTAN.		
07. Originator: Mohanty	Title: PI	Date: 5/5/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGP	Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 5/5/97	
11. Element Manager: RGP	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06		
13. Implemented By: R. Ricci		Date: 6/5/97

'Streamtube.dat' is file with this information.

## SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-107		
02. Project Title: TPA 3.0 Code Development		20-5708-762 Project Number:
03. SPCR Title: Change reader.f error message for more description		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
reader.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
When a different aqueous nuclide (other than one of the acceptable names) was specified in 'tpa.inp' the error message was not descriptive		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Solution was to add a list of acceptable names to the error message printout		
07. Originator: S. Mohanty	Title: PI	Date: 4/28
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGB	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/28	
11. Element Manager: RGB	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rice		Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-106	
02. Project Title: TPA 3.0 Code Modifications	20-5708-762 Project Number:
03. SPCR Title: Changed code based on for-study comments (errors/messages)	
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION	
uzflow.f      invent.f      subarea.f      fault.f excel.f      mv.f      array.f reader.f      sampler.f      volcano.f	
05. DESCRIPTION OF PROBLEM/CHANGE	
for-study program gave error/warning messages	
06. PROBLEM SOLUTION/NEED FOR CHANGE	
modify code to remove for-study messages and create *.i files	
07. Originator: S. Mohanty	Title: PI      Date: 4/22/97
PROJECT	
08. Need by Date: 8/8/97	09. Approved: RGP      Disapproved:
10. Software Developer: S. Mohanty et. al.	Date: 4/22/97
11. Element Manager: RGP	Date: 6/5/97
12. IMPLEMENTED SOLUTION	
implemented as described in section 06	
13. Implemented By: R. Rice	Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-105		
02. Project Title: TPA 3. Code Development		20-5708-762 Project Number:
03. SPCR Title: Changed volcano.f to initialize values every realization		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
volcano.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
the fraction of waste packages failed due to volcanic events was not initialized; consequently values were potentially carried forward from realization to realization		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
initialized the fraction of WPs failed due to volcanism (i.e., pfail)		
07. Originator: S. Mohanty	Title: PI	Date: 3/31/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RGB	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 3/31/97	
11. Element Manager: R.G. Baco	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06		
13. Implemented By: R. Rice		Date: 5/24/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-104		
02. Project Title: TPA Code development		20-5708-762 Project Number:
03. SPCR Title: Modify exec.f to screen print WPs failed and change format of the		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f ebsfail.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
NRC Staff expressed interest in seeing the # WPs failed instead of fraction WP failed as screen print; also there were inconsistencies between numbers (and their format) and text in the screen print		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Solution was to modify exec.f by multiplying fract. failed by the total number of WPs and printing these values to the screen; also changed text and # format for consistency		
07. Originator: Mohanty	Title: PI	Date: 4/17/97
PROJECT		
08. Need by Date: 08/08/97	09. Approved: PG	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/17/97	
11. Element Manager: PG Bala	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
Implemented as described in section 06		
13. Implemented By: R. Rice		Date: 5/20/97

screen print

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-1013 <sup>11-11</sup>		
02. Project Title: TPA code development		20-5708-762 Project Number:
03. SPCR Title: Modify exec.f to write to files all input & output for each exec.f <sup>consequence module</sup>		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
exec.f fu.i (increase max. # fileunits)		
05. DESCRIPTION OF PROBLEM/CHANGE		
Input and output for each consequence module within exec.f were passed in arrays and not written to files — so it was not possible to check input and output values for correctness/reasonableness/etc		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Created files which have all input (*.ech or echo files) and all outputs (*.res or results files) for each of the 13 consequence modules within the exec (26 file total) and placed much of the new code within an <sup>exec</sup> subroutine 'set-files'		
07. Originator: Mohanty	Title: PI	Date: 4/16/97
PROJECT		
08. Need by Date: 8/8/97	09. Approved: RJB	Disapproved:
10. Software Developer: S. Mohanty et al.	Date: 4/16/97	
11. Element Manager: RJB	Date: 6/5/97	
12. IMPLEMENTED SOLUTION		
implemented as described in section 06 of this form.		
13. Implemented By: R. Rico		Date: 5/28/97

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: PA-SPCR-102		
02. Project Title: TSPA&I Code Development		20-5708-762
03. SPCR Title: Change of a units conversion error in ASHRMOVO Module and Other Changes of Lesser Importance		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
1. ashrmovo.f		
05. DESCRIPTION OF PROBLEM/CHANGE		
<p>1. Page 11, lines 10-11 of the attachment: The units conversion constant at the end of this line (1.0d-4) incorrectly converts Ci/cm<sup>2</sup> to Ci/m<sup>2</sup>. The correct conversion constant should be 1.0d+4. This change should be made by commenting out lines 51 and 52, and replacing them with lines 49 and 50 as shown on the attachment.</p> <p>2. Page 3, Line 51 to Page 5 Line 35: The labeling of all Kd values should be in 'cm<sup>3</sup>/g'. This change has been made on the attached version. It is noted that the actual values were always in cm<sup>3</sup>/g they were just mislabeled and that the parameter labels in the input file should be changed accordingly.</p> <p>3. Page 10 Line 24: The argument of the if statement has been changed due to one of the terms being incomplete (see attachment).</p> <p>4. Page 10 Lines 33-34: Similar to 3. above, this line has been changed to complete the last term in the equation.</p>		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
<p>1. This error results in the underprediction of doses from the extrusive volcanism scenario by eight orders of magnitude.</p> <p>2.-4. These errors are of lesser importance but should still be changed to the corrected solutions in the attachment. They only affect the point at which the release has become rate limited as opposed to solubility limited.</p>		
07. Originator: Mark Jarzempa	Title: Research Engineer	Date: 5/27/97
PROJECT		
08. Need by Date: 6/1/97	09. Approved: <i>RG</i>	Disapproved:
10. Software Developer: <i>S. Mohanty et. al.</i>		Date: <i>5/27/97</i>
11. Element Manager: <i>RG Baca</i>		Date: <i>6/5/97</i>
12. IMPLEMENTED SOLUTION		
See the attachment as itemized above.		
13. Implemented By: <i>Mark Jarzempa</i>		Date: <i>6-4-97</i>



**postscript**

**JOB 783**

**MSJ:TPA:test\_files:ashplume\_tests:ash  
plume.in**

**For: MSJ**  
**Creator: MPW Shell: LaserWriter 8 8.1.1**  
**Creation Date: 9:13 AM Friday, June 6, 1997**

**Submit queue: IF 1 / Ethernet / ETHERTALK**  
**Submitted: Sun Apr 13 01:11:23 1992**  
**Started: Sun Apr 13 01:11:24 1992**

```
No Title
-40.d0  40.d0      ! xmin, xmax in km
-100.d0  6.d0      ! ymin, ymax in km
41       ! numptsx
54       ! numptsy
4.80d0   6.86d0    ! tlogmin, tlogmax- logs of t in sec
9.41     11.55     ! powlogmin, powlogmax- logs of P in W
-2.0d0   -0.3d0    ! betalogmin, betalogmax-logs
-2.0d0   -1.0d0    1.0d0 ! dmeanmin, dmeanmed, dmeanmax-logs of d in cm
0.1d0    1.0d0     ! dsigmamin, dsigmamax
0.8      0.8       ! ashdenmin, ashdenmax in g/cm3
-2.d0    -1.d0     ! ashrholow, ashrhohi
0.5d0    ! fshape
0.001293d0 1.8d-04 ! airden in g/cm3, airvis in g/cm-s
400.d0    ! c in cm2/s to the 5/2
10.d0     ! dmax in cm
0.0001d0  0.001d0  0.01d0 ! fdmin, fdmean, fdmax al in cm
0.001d0    ! hmin in km
1.d-10d0   ! acutoff in g/cm2
0.3d0      ! rhocut-incorporation ratio
1.d8       ! Uran- total mass of fuel in g
```

**postscript**

**JOB 782**

**MSJ:TPA:test\_files:ashplume\_tests:ash  
plume.out**

**For:** MSJ  
**Creator:** MPW Shell: LaserWriter 8 8.1.1  
**Creation Date:** 9:11 AM Friday, June 6, 1997  
  
**Submit queue:** IF 1 / Ethernet / ETHERTALK  
**Submitted:** Sun Apr 13 01:08:55 1992  
**Started:** Sun Apr 13 01:08:56 1992

iseed= 10  
 ASHPLUME version 1.0  
 No Title

```
*****
*
*          realization number                1
*          wind speed (cm/s)                1000.0000
*          wind direction (deg)              -90.0000
*          mean particle diameter (cm)        0.1000
*          log- std dev                      0.4000
*          column ht (km)                    10.0000
*          event duration (s)                 0.3318E+06
*          ash mass (g)                      0.1000E+16
*          event power (W)                   0.2212E+13
*          beta                             0.1000
*          vent exit velocity (cm/s)          10000.0000
*          particle shape parameter           0.5000
*          air density (g/cc)                 0.1293E-02
*          air viscosity (g/cm-s)             0.1800E-03
*          eddy diff. constant (cm2/s5/2)     400.0000
*          size cutoff (cm)                   10.0000
*          incorporation ratio                0.3000
*          fuel particle minimum log-diam      -4.0000
*          fuel particle median log-diam       -3.0000
*          fuel particle maximum log-diam      -2.0000
*          total fuel mass available (g)       0.1000E+09
*
*****
```

x (km)	y (km)	xash (g/cm^2)	xfuel (g/cm^2)
-40.000	-100.000	0.1293E+00	0.1287E-07
-40.000	-98.000	0.1287E+00	0.1281E-07
-40.000	-96.000	0.1276E+00	0.1271E-07
-40.000	-94.000	0.1262E+00	0.1258E-07
-40.000	-92.000	0.1244E+00	0.1240E-07
-40.000	-90.000	0.1222E+00	0.1218E-07
-40.000	-88.000	0.1195E+00	0.1192E-07
-40.000	-86.000	0.1164E+00	0.1161E-07
-40.000	-84.000	0.1129E+00	0.1126E-07
-40.000	-82.000	0.1089E+00	0.1086E-07
-40.000	-80.000	0.1045E+00	0.1043E-07
-40.000	-78.000	0.9972E-01	0.9953E-08
-40.000	-76.000	0.9456E-01	0.9439E-08
-40.000	-74.000	0.8907E-01	0.8892E-08
-40.000	-72.000	0.8329E-01	0.8315E-08
-40.000	-70.000	0.7727E-01	0.7715E-08
-40.000	-68.000	0.7108E-01	0.7097E-08
-40.000	-66.000	0.6478E-01	0.6469E-08
-40.000	-64.000	0.5851E-01	0.5841E-08
-40.000	-62.000	0.5220E-01	0.5212E-08
-40.000	-60.000	0.4608E-01	0.4601E-08
-40.000	-58.000	0.4018E-01	0.4011E-08
-40.000	-56.000	0.3458E-01	0.3452E-08
-40.000	-54.000	0.2934E-01	0.2929E-08
-40.000	-52.000	0.2453E-01	0.2448E-08
-40.000	-50.000	0.2018E-01	0.2014E-08
-40.000	-48.000	0.1633E-01	0.1630E-08
-40.000	-46.000	0.1299E-01	0.1296E-08
-40.000	-44.000	0.1014E-01	0.1011E-08
-40.000	-42.000	0.7770E-02	0.7748E-09
-40.000	-40.000	0.5839E-02	0.5821E-09

-40.000	-38.000	0.4303E-02	0.4289E-09
-40.000	-36.000	0.3111E-02	0.3099E-09
-40.000	-34.000	0.2206E-02	0.2198E-09
-40.000	-32.000	0.1538E-02	0.1531E-09
-40.000	-30.000	0.1091E-02	0.1080E-09
-40.000	-28.000	0.7319E-03	0.7247E-10
-40.000	-26.000	0.4776E-03	0.4730E-10
-40.000	-24.000	0.3185E-03	0.3150E-10
-40.000	-22.000	0.2125E-03	0.2096E-10
-40.000	-20.000	0.1426E-03	0.1403E-10
-40.000	-18.000	0.9691E-04	0.9495E-11
-40.000	-16.000	0.6710E-04	0.6541E-11
-40.000	-14.000	0.4757E-04	0.4611E-11
-40.000	-12.000	0.3466E-04	0.3337E-11
-40.000	-10.000	0.2600E-04	0.2485E-11
-40.000	-8.000	0.2008E-04	0.1904E-11
-40.000	-6.000	0.1595E-04	0.1512E-11
-40.000	-4.000	0.1295E-04	0.1210E-11
-40.000	-2.000	0.1076E-04	0.9978E-12
-40.000	0.000	0.9111E-05	0.8390E-12
-40.000	2.000	0.7837E-05	0.7171E-12
-40.000	4.000	0.6833E-05	0.6215E-12
-40.000	6.000	0.6026E-05	0.5450E-12
-38.000	-100.000	0.1547E+00	0.1540E-07
-38.000	-98.000	0.1548E+00	0.1542E-07
-38.000	-96.000	0.1545E+00	0.1540E-07
-38.000	-94.000	0.1538E+00	0.1533E-07
-38.000	-92.000	0.1526E+00	0.1522E-07
-38.000	-90.000	0.1510E+00	0.1505E-07
-38.000	-88.000	0.1488E+00	0.1484E-07
-38.000	-86.000	0.1460E+00	0.1457E-07
-38.000	-84.000	0.1427E+00	0.1424E-07
-38.000	-82.000	0.1388E+00	0.1385E-07
-38.000	-80.000	0.1344E+00	0.1341E-07
-38.000	-78.000	0.1294E+00	0.1291E-07
-38.000	-76.000	0.1238E+00	0.1236E-07
-38.000	-74.000	0.1177E+00	0.1175E-07
-38.000	-72.000	0.1111E+00	0.1110E-07
-38.000	-70.000	0.1042E+00	0.1040E-07
-38.000	-68.000	0.9704E-01	0.9689E-08
-38.000	-66.000	0.8908E-01	0.8894E-08
-38.000	-64.000	0.8132E-01	0.8120E-08
-38.000	-62.000	0.7879E-01	0.7860E-08
-38.000	-60.000	0.6549E-01	0.6539E-08
-38.000	-58.000	0.5773E-01	0.5764E-08
-38.000	-56.000	0.5022E-01	0.5013E-08
-38.000	-54.000	0.4307E-01	0.4299E-08
-38.000	-52.000	0.3638E-01	0.3630E-08
-38.000	-50.000	0.3023E-01	0.3016E-08
-38.000	-48.000	0.2469E-01	0.2463E-08
-38.000	-46.000	0.1979E-01	0.1974E-08
-38.000	-44.000	0.1556E-01	0.1552E-08
-38.000	-42.000	0.1199E-01	0.1196E-08
-38.000	-40.000	0.9048E-02	0.9020E-09
-38.000	-38.000	0.6680E-02	0.6658E-09
-38.000	-36.000	0.4825E-02	0.4807E-09
-38.000	-34.000	0.3409E-02	0.3396E-09
-38.000	-32.000	0.2358E-02	0.2349E-09
-38.000	-30.000	0.1600E-02	0.1592E-09
-38.000	-28.000	0.1066E-02	0.1061E-09
-38.000	-26.000	0.7000E-03	0.6730E-10
-38.000	-24.000	0.4637E-03	0.4582E-10

**postscript**

**JOB 780**

**MSJ:TPA:test\_files:ashplume\_tests:integrator.f**

**For:** MSJ  
**Creator:** MPW Shell: LaserWriter 8 8.1.1  
**Creation Date:** 9:10 AM Friday, June 6, 1997  
**Submit queue:** IF 1 / Ethernet / ETHERTALK  
**Submitted:** Sun Apr 13 01:08:03 1992  
**Started:** Sun Apr 13 01:08:04 1992



**postscript**

**JOB 781**

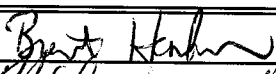
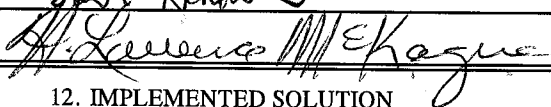
**MSJ:TPA:test\_files:ashplume\_tests:integrator.out**

**For:** MSJ  
**Creator:** MPW Shell: LaserWriter 8 8.1.1  
**Creation Date:** 9:11 AM Friday, June 6, 1997  
  
**Submit queue:** IF 1 / Ethernet / EThERTALK  
**Submitted:** Sun Apr 13 01:08:35 1992  
**Started:** Sun Apr 13 01:08:42 1992



```
xmin= -40.000    xmax= 40.000
ymin= -100.000   ymax= 6.000
numptsx= 41 numpty= 54
deltaxcm= 200000.000 deltaycm= 200000.000
    ash mass integrated over isopach (g) = 0.1032E+16
    ash mass extruded in event (g) = 0.1000E+16
    fuel mass integrated over isopach (g) = 0.1031E+09
    fuel mass extruded in event (g) = 0.1000E+09
```

# SOFTWARE PROBLEM/CHANGE REPORT

01. SPCR Number: GLGP-SPCR-101		
02. Project Title: Structural Deformation Code Development		Project Number: 20-5708-472
03. SPCR Title: 3DStress, Version 1.2		
04. AFFECTED SOFTWARE AND/OR DOCUMENTATION		
3DStress Software, User's Manual, Installation Test Procedure, Design Verification Report, Software Requirements Description		
05. DESCRIPTION OF PROBLEM/CHANGE		
Revised graphical user interface and added new features described in software requirements description for version 1.2.		
06. PROBLEM SOLUTION/NEED FOR CHANGE		
Modifications were requested by users of 3DStress, Version 1.1.		
07. Originator: B. Henderson	Title: Sr. Research Engineer	Date: 10/17/96
PROJECT		
08. Need by Date:	09. Approved:	Disapproved:
10. Software Developer: B. Henderson		Date: 10/18/96
11. Element Manager: L. McKague		Date: 10/2/96
12. IMPLEMENTED SOLUTION		
Implemented modifications to software and documentation.		
13. Implemented By: B. Henderson		Date: 11/12/96