INFORMATION ONLY

VIPRE-01 CODE TROUBLE REPORTS

V1-TRF-001, Revision 78
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Prepared for the

VIPRE User Group

APPROVED BY:

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VIPRE-01 MOD02.8 Trouble Report List

The following table summarizes the status of all trouble reports that were unresolved when VIPRE-01 MOD02.8 was released, plus those filed subsequently. New trouble reports or those whose status have changed since the previous trouble report list was issued are identified with **bold** trouble report numbers. Descriptions for VIPRE-01 Trouble Reports 310 through 320 were included on the MOD02.8 transmittal.

A complete list of modifications, and their corresponding trouble reports, can be found in Volume 2, Appendix B of the VIPRE-01 MOD02.8 documentation.

The **Part 21 Status Codes** regarding relevance to 10CFR Part 21, *Reporting of Defects and Noncompliance*, are interpreted as follows;

No, "not a safety issue"
Yes, "potentially a substantial safety issue"
Indeterminate, "indeterminate defect; must be evaluated by licensee"

Code errors that are determined to pose a potential substantial safety issue are assigned a **Part 21 Status Code** of Yes and must be reported directly to the U.S. Nuclear Regulatory Commission. To date, no such error has been discovered in the VIPRE-01 code.

Indeterminate defects are assigned a **Part 21 Status Code** of Indeterminate. They must be evaluated by each organization using VIPRE-01 to determine whether or not the defect is reportable per the requirements of 10CFR21, based on the organization's use of the code version (or related version) identified above.

Copies of any preliminary modifications are available from Numerical Advisory Solutions, the VIPRE User Group Engineering Contractor. Please contact Darian King at (208) 419-4008 or Pam Richardson at (208) 419-4004; or via email at kingdb@numerical.com or richardsonp@numerical.com, respectively.

(1) **num** bold indicates a new trouble report or an old one whose status changed since last report
(2) ---- indicates the reported problem is not an error
**** indicates the reported problem has not been resolved
num indicates modification number or document and revision number for corrections

Trouble Report No. (1)	Description	Part 21 Status Code	Corr. Status(2)
tr_244	The Memorandum describes a problem with oscillatory behavior of CPR versus number of axial nodes, non-physical CPR jumps in response to small changes in bundle power, and some situations in which the boiling node is not identified. Thermal Hydraulic solution convergence problems are mentioned in the introduction, but not further described. The reason is that this behavior is not believed to be related to the use of the Hench-Gillis correlation.	No	
tr_321	A problem was identified with VIPRE-01 MOD 2.7 plot variable GAPC. This variable appeared to be processed correctly when using the Dynamic Gap Conductance Model but incorrectly when using a Gap Conductance Forcing Function. A test case for debugging by NAS was developed by revising a 10-second null transient to use a forcing function that varied from 1.0 at 0 seconds to 2.0 at 10 seconds. Review of the output file showed that the gap conductance values in the NUCLEAR FUEL ROD NO edits included the forcing function. However, review of the plot file showed that the gap conductance values excluded the forcing function. Initial investigation found that the problem was apparently caused by plotting a variable that excluded the forcing function.	No	mod_348
tr_322	It was observed that the top node of an axial power profile using an automatic spline fit option set the top node to zero when using MOD 02.8 in some cases, which did not occur in MOD02.7. It is believed that an error was unintentionally introduced from MOD_347 (tr_320), which also deals with the top node of the spline fit option. MOD_347 corrects an error which in some cases sets the top node of a spline fit axial power profile to zero, the input files tested showed the behavior as being corrected without causing differences in other input files, but it seems there are some cases that were affected.	No	mod_349
tr_323	It was observed that in the output file, the temporal power profile table was not being printed entirely when the number of temporal power profile tables is greater than 5. When the number of temporal power profile tables is greater than 5, the tables are only printed in multiples of 5 once the number of tables is greater than that multiple of 5. For example, if 11 tables are input, 10 are printed in the output file.	No	mod_352

(1) **num** bold indicates a new trouble report or an old one whose status changed since last report
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num indicates modification number or document and revision number for corrections

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VIPRE-01 Software Trouble Report

Trouble Report Number: tr_244

Reported By: Pavel Hejzlar, MIT ***Date:*** 12/1/2006

Reported To: Mark Paulsen ***Date:*** 12/4/2006

Program Version: VIPRE-01 MOD02.0 ***Computer/Operating System:*** All

Listing Supplied: Yes

Input File Supplied: Yes

Input Model Description:

BWR fuel bundle cases using the Hench-Gillis Correlation. Oxide Core Square Subchannel hydride Core Square Subchannel

Description of Problem:

The Memorandum describes a problem with oscillatory behavior of CPR versus number of axial nodes, non-physical CPR jumps in response to small changes in bundle power, and some situations in which the boiling node is not identified.

Thermal Hydraulic solution convergence problems are mentioned in the introduction, but not further described. The reason is that this behavior is not believed to be related to the use of the Hench-Gillis correlation.

Impact of Error on Current and Previous Code Versions:

Modeling Alternatives:

N/A

Modification Number or Resolution:

Originator Notification:

User Notified: Yes ***Method of Contact:*** Email

Notified By: Mark Paulsen, ZNE ***Date:*** 12/1/2006

Trouble Report Disposition:

Determined By: Mark Paulsen ***Closure/Discovery Date:*** 12/4/2006

Deviation Evalaution: Major

Reason for Determination:

Error may cause non-physical CPR result from the Hench-Gillis Correlation

10CFR Part 21 Evaluation:

Reportable Defect: No

Reason for Determination:

Hench-Gillis is a BWR CPR correlation. The Hench-Gillis correlation has not been approved for licensing analysis according to the VIPRE-01 SER. Therefore no licensing calculations or results are affected by the model behavior reported above.

Determined By: Garry Gose ***Date:*** 4/14/2009

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VIPRE-01 Software Trouble Report

Trouble Report Number: tr_321

Reported By: Rich Schoff ***Date:*** 9/25/2023

Reported To: Darian King ***Date:*** 9/25/2023

Program Version: VIPRE-01 MOD02.7/02.8 ***Computer/Operating System:*** All

Listing Supplied: No

Input File Supplied: Yes

Input Model Description:

A test case for debugging by NAS was developed by revising a 10-second null transient to use a forcing function that varied from 1.0 at 0 seconds to 2.0 at 10 seconds. Input file was adjusted by NAS to run on the licensed version of MOD 02.8.

Description of Problem:

A problem was identified with VIPRE-01 MOD 2.7 plot variable GAPC. This variable appeared to be processed correctly when using the Dynamic Gap Conductance Model but incorrectly when using a Gap Conductance Forcing Function. A test case for debugging by NAS was developed by revising a 10-second null transient to use a forcing function that varied from 1.0 at 0 seconds to 2.0 at 10 seconds. Review of the output file showed that the gap conductance values in the NUCLEAR FUEL ROD NO edits included the forcing function. However, review of the plot file showed that the gap conductance values excluded the forcing function. Initial investigation found that the problem was apparently caused by plotting a variable that excluded the forcing function.

Impact of Error on Current and Previous Code Versions:

All versions after VIPRE-01 MOD02.6

Modeling Alternatives:

None

Modification Number or Resolution:

mod 348

Originator Notification:

User Notified: Yes ***Method of Contact:*** Email

Notified By: Darian King ***Date:*** 11/3/2023

Trouble Report Disposition:

Determined By: Darian King ***Closure/Discovery Date:*** 11/3/2023

Deviation Evalaution: Minor

Reason for Determination:

Values in error are only those relating to the plot file, not the official output file and does not effect the overall calculations.

10CFR Part 21 Evaluation:

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VIPRE-01 Software Trouble Report

Reportable Defect: No

Reason for Determination:

Minor Deviation, no impact to calculations

Determined By: Darian King ***Date:*** 11/3/2023

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VIPRE-01 Software Trouble Report

Trouble Report Number: tr_322

Reported By: James Reed ***Date:*** 12/18/2023

Reported To: Darian King ***Date:*** 12/18/2023

Program Version: VIPRE-01 MOD02.8 ***Computer/Operating System:*** All

Listing Supplied: No

Input File Supplied: Yes

Input Model Description:

These two models include spline-fit axial power profiles with the axial power entered ending at a node boundary.

Description of Problem:

It was observed that the top node of an axial power profile using an automatic spline fit option set the top node to zero when using MOD 02.8 in some cases, which did not occur in MOD02.7. It is believed that an error was unintentionally introduced from MOD_347 (tr_320), which also deals with the top node of the spline fit option. MOD_347 corrects an error which in some cases sets the top node of a spline fit axial power profile to zero, the input files tested showed the behavior as being corrected without causing differences in other input files, but it seems there are some cases that were affected.

Impact of Error on Current and Previous Code Versions:

MOD02.8

Modeling Alternatives:

A user may avoid this error by entering in the desireed axial power manually rather than allow VIPRE to automatically create the power profile. A user may also use the linear power fit option, or enter a heated length that encroaches into the next axial node, which will then be set to zero.

Modification Number or Resolution:

mod 349

Originator Notification:

User Notified: Yes ***Method of Contact:*** Email

Notified By: Darian King ***Date:*** 1/8/2024

Trouble Report Disposition:

Determined By: Darian King ***Closure/Discovery Date:*** 1/8/2024

Deviation Evalaution: Major

Reason for Determination:

Spline-fit of axial power profile table is not working as intended. Top node is being set to zero unintentionally.

10CFR Part 21 Evaluation:

Reportable Defect: No

Reason for Determination:

While the spline-fit option is not working correctly, the axial power profile is clearly printed for the User to see what power is being applied at each axial level. Error only occurs the end of the profile where impact on overall calculations is small.

Determined By: Darian King ***Date:*** 1/8/2024

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VIPRE-01 Software Trouble Report

Trouble Report Number: tr_323

Reported By: Rich Schoff ***Date:*** 3/13/2024

Reported To: Darian King ***Date:*** 3/13/2024

Program Version: VIPRE-01 MOD02.8 ***Computer/Operating System:*** All

Listing Supplied: No

Input File Supplied: Yes

Input Model Description:

Input model is built specifically for exhibiting this error. Test cases show 1, 5, 6, 10, and 11 tables.

Description of Problem:

It was observed that in the output file, the temporal power profile table was not being printed entirely when the number of temporal power profile tables is greater than 5. When the number of temporal power profile tables is greater than 5, the tables are only printed in multiples of 5 once the number of tables is greater than that multiple of 5. For example, if 11 tables are input, 10 are printed in the output file.

Impact of Error on Current and Previous Code Versions:

MOD 02.8

Modeling Alternatives:

None

Modification Number or Resolution:

mod 352

Originator Notification:

User Notified: Yes ***Method of Contact:*** Email

Notified By: Darian King ***Date:*** 3/13/2024

Trouble Report Disposition:

Determined By: Darian King ***Closure/Discovery Date:*** 3/13/2024

Deviation Evalaution: Minor

Reason for Determination:

Tables were not being correctly printed in the output file, but the values were correctly applied to the calclutions within VIPRE-01.

10CFR Part 21 Evaluation:

Reportable Defect: No

Reason for Determination:

Minor Deviation

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VIPRE-01 Software Trouble Report

Determined By: Darian King ***Date:*** 3/13/2024