The RETRAN/VIPRE Newsletter

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INSIDE

Iberdrola Reports Three-Dimensional Kinetics Analysis for BWR CRDA

At the November 2004 RETRAN/VIPRE User Group meeting, Andres Gomez of Iberdrola presented results from a detailed study of the impact of a Control Rod Drop Accident for the Cofrentes Nuclear Power Plant. Cofrentes is a 3237 MWt GE 624 bundle BWR, located in Valencia, Spain. Currently in the 16th cycle, it has a mixed core of GNF, Westinghouse, and FRAMATOME bundle designs.

Iberdrola performed this analysis using RETRAN-3D MOD003.1. Selected steady-state results were compared with SIMULATE-3 and transient results were compared with RAMONA.

The Control Rod Drop Accident (CRDA) is a Reactor Initiated Accident whose analysis is a part of the licensing basis accident analysis required for boiling water reactors (BWRs). These analyses simulate the reactor coolant system, core, fuel rod, and fuel pellet response to the transient induced by a rapid positive reactivity insertion produced by the drop of a control rod initially fully inserted.

The immediate CRDA consequence is an overpower event that is characterized by production of an amount of stored energy that the fuel could not tolerate without damage. In fact, the current Standard Review Plan (NUREG-800) sets forth an enthalpy limit for RIA safety analyses of 280 cal/g. This limit is based on early tests with low burn-up and unirradiated fuel rods and was intended to preclude fuel dispersal by avoiding incipient melting of UO2. By precluding fuel dispersal, coolable fuel geometry is ensured and steam explosions cannot occur.

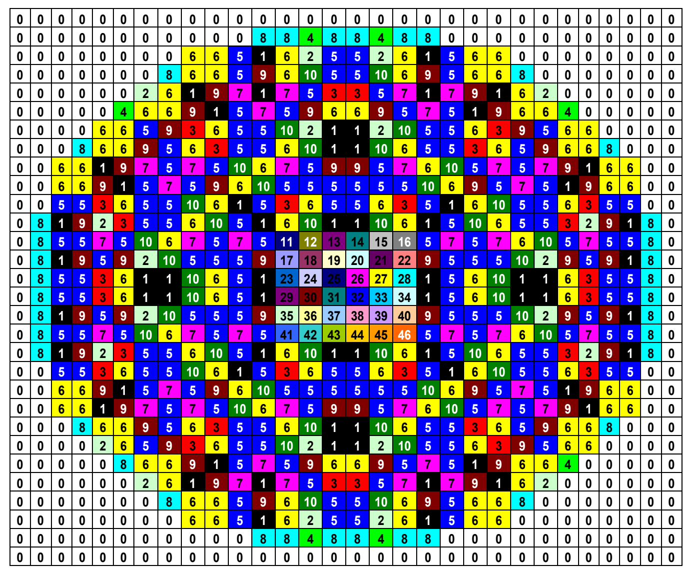

Figure 1. Lumping of 46 Thermohydraulic Channels

The focus of the Iberdrola analysis was to identify and quantify the effect of the overpower transient. The total reactivity worth of the falling control rod results in an increase in the fuel enthalpy (stored energy) induced by it. Neutronics data and conditions from the Cofrentes Cycle 12 beginning of cycle (BOC) were used since it is known that the accident is more severe at BOC and low power conditions.

In addition, Iberdrola reported results from sensitivity studies to identify modeling options that can affect the analyses.

RETRAN-3D MODEL

The CRDA is a fast and short duration core transient with very little interaction from the associated reactor system. For this reason, the Iberdrola model only used a detailed 3D core with bypass, lower plenum, and upper plenum. The NSSS system was modeled as plenum boundary conditions are used.

The RETRAN rod control system was used for simulating the control rod motion. The Cofrentes core at BOC consisted of 624 fuel assemblies from two vendors GNF and W-AB (70% of GE11 and 30% of SVEA96+). Figure 1 shows the core arrangement showing the different bundle types (13-14: GE11, 17-18:SVEA, and 1: radial reflector). The core is a cubic matrix of 28x28x25 active cells surrounded by a one-cell reflector.

Iberdrola Reports Three-Dimensional Kinetics Analysis for BWR CRDA (Cont'd)

In order to simplify the model and reduce the execution time, the 624 core thermal-hydraulic channels were lumped in 46 RETRAN-3D channels as shown in Figure 1. The lumping criterion was based in the steady-state power distribution from SIMULATE-3. The bypass was modeled by 25 volumes connecting both upper and lower plena.

The effects of direct moderator heating were included by allowing 2% of total energy to be deposited in the active coolant and bypass channels. Since the transient is so fast, the effect of transient decay heat was neglected.

CONTROL ROD MODELING

The maximum rod worth for these conditions (BOC, c12) was located using SIMULATE-3 and was determined to be the central rod.

Three control rods groups were simulated. Figure 2 shows these as the fully inserted group, the fully withdrawn group, and the central rod.

The drop of the central rod and the scram action is modeled with the RETRAN-3D control system.

A conservative value of 1.00 m/s was assumed as a rod drop velocity. Taking into account that the full length is 48 notches, it will take 3.66 s. to reach its final position. This value is similar to the previous RAMONA calculation used for comparison in this study

The high power signal at 120% of rated power activates the scram, then after a delay of 0.65 s. the rods start moving. It affects only the fully withdrawn rods. The dropped rod is unaffected by the scram. These values are similar to the RAMONA calculations.

CASE DESCRIPTIONS

Four cases were examined. Each dropped the central rod, with the same initial position but used different final positions as shown in Table 1. The final positions are: 8, 10, 12, and 48 (full) notches.

Table 1. Insertion Cases Description

Case	Initial Withdrawal (notches)	Final Withdrawal (notches)
T1	0	8
T2	0	10
T3	0	12
T4	0	48

INITIAL CONDITIONS

For a typical BWR above 5% of rated power, the CRDA will not result in a peak fuel enthalpy greater than the design limit. In this analysis, low power is considered in order to maximize this peak.

The initial conditions for the RETRAN-3D simulations are in Table 2.

Table 2. Initial Conditions

	CZP	
RATED TOTAL REACTOR POWER	28.94	W
CORE INLET TEMPERATURE	20	°C
SYSTEM PRESSURE	70.0E+5	Pa
TOTAL CORE MASS FLOW RATE	3726.0	Kg/s
% BYPASS MASS FLOW RATE	10	%

For these cold conditions, the large amount of subcooling produced by the low feedwater temperature of 20ºC and the conservative vessel pressure prevents any void production during the transient, and so its effect in the power rise and the fuel rod enthalpy. These conditions are not totally representative of the real plant conditions but were selected similar to those used in the W-AB RAMONA licensing calculations for comparison.

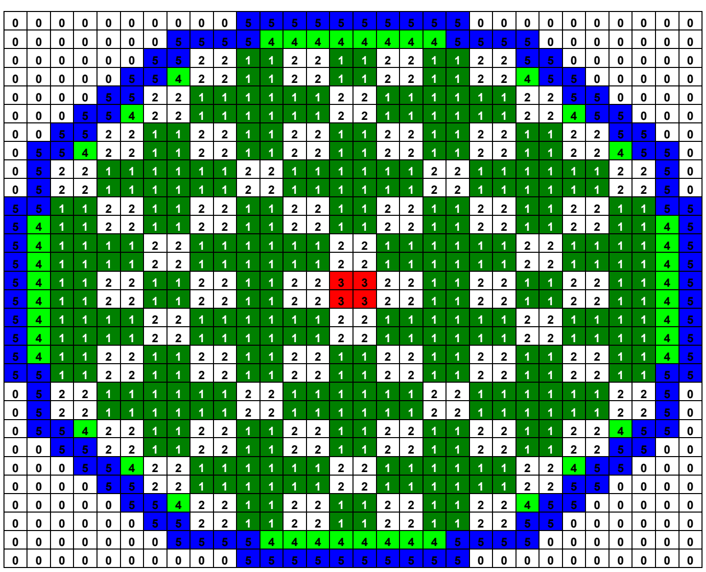

Figure 2. Radial Map of the Three Control Rod Groups Modeled

Iberdrola Reports Three-Dimensional Kinetics Analysis for BWR CRDA (Cont'd)

STEADY-STATE RESULTS

Static Checking RETRAN-3D/SIMULATE-3

At Iberdrola, CASMO/SIMULATE are used for core-related analyses, including cycle depletion calculations and static reactivity studies. In the case of CRDA and core asymmetric transients, the analyses are performed using the 3D feature of RETRAN, so a set of 3D core cross sections must be provided from SIMULATE-3. A very efficient methodology (SIMTAB) is used to process the kinetics information and convert it to the format required by RETRAN-3D.

It was necessary to check that both, SIMULATE-3, and RETRAN-3D give the same initial results. The Iberdrola method compares core average axial power distribution as shown in Figure 3. Other key parameters, Keff, Beta, and axial offset are also compared in Table 3.

The static rod worth comparison, which is important for this transient, is shown in Figure 4.

Table 3. Cold Zero Power, SIMULATE-3/ RETRAN-3D Comparison

	SIMULATE	RETRAN-3D
K-eff	1,0255	1,01700
Beta-eff	0,00614	0,00593
Axial Offset	0,65200	0,65957

TRANSIENT RESULTS

The RETRAN-3D CRDA Cases T1 through T4 results are compared with previous results performed by W-AB using the RAMONA code.

Figures 5 and 6 represent the power history of Cases T1 and T2, respectively. The other cases results are similar to T2 due to their similar phenomenology.

Case T1 is singular due to the low reactivity induced by the control rod drop, dropping only eight notches from the top of the core. This reactivity produces a neutron flux peak that does not reach the threshold of 120%, necessary to trigger the scram signal. The power peak reaches approximately 1900 MW. The peak is ended by the Doppler reactivity, but the power is nearly stabilized at 200 MW until the end of the analysis at 15 s.

Cases T2, T3, and T4 are very different from T1, because the neutron flux induced by the peak reactivity is sufficient for triggering the scram signal which shut down the reactor to 0 MW before 5 s.

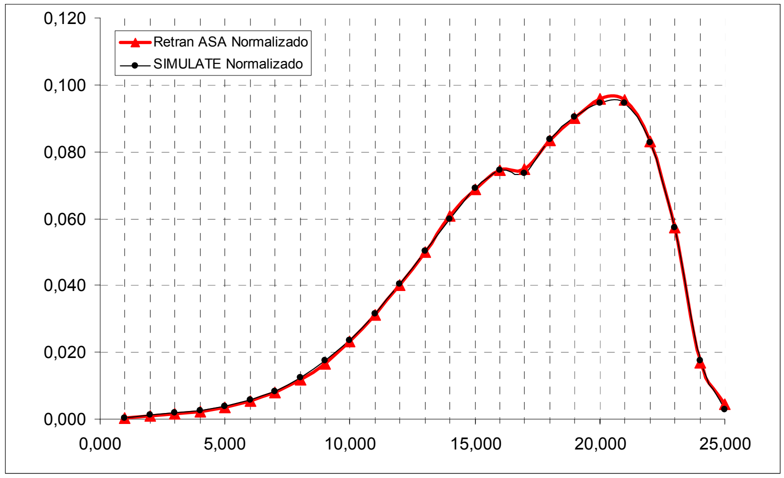

Figure 3. Cold Zero Power RETRAN-3D/SIMULATE-3 Axial Profile

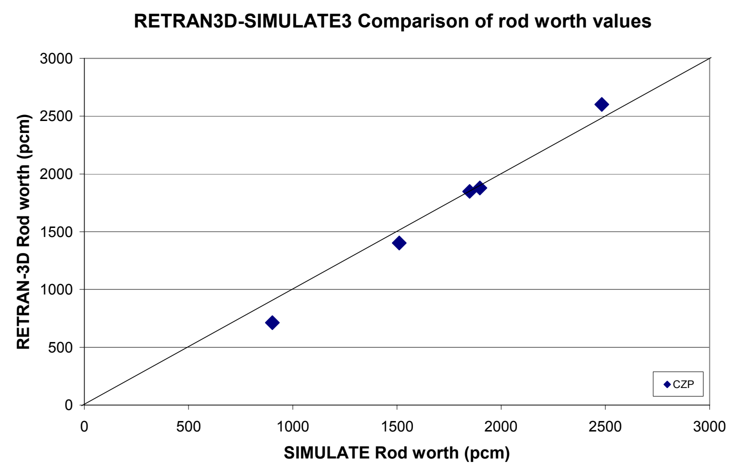

Figure 4. Rod Worth, SIMULATE-3/RETRAN-3D Comparison

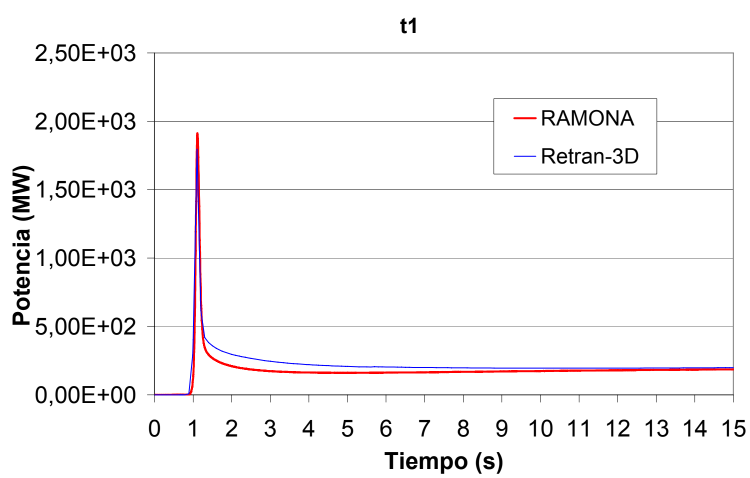

Figure 5. Case T1 - Core Power Comparison of RETRAN-3D vs. RAMONA

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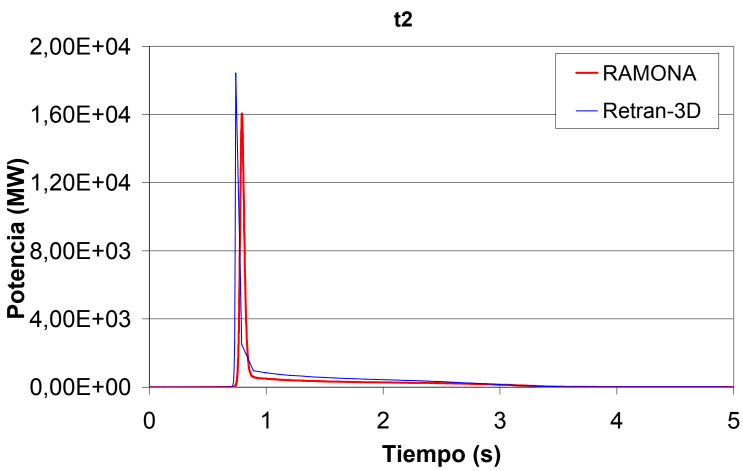

Figure 6. Case T2, Core Power Comparison of RETRAN-3D vs. RAMONA

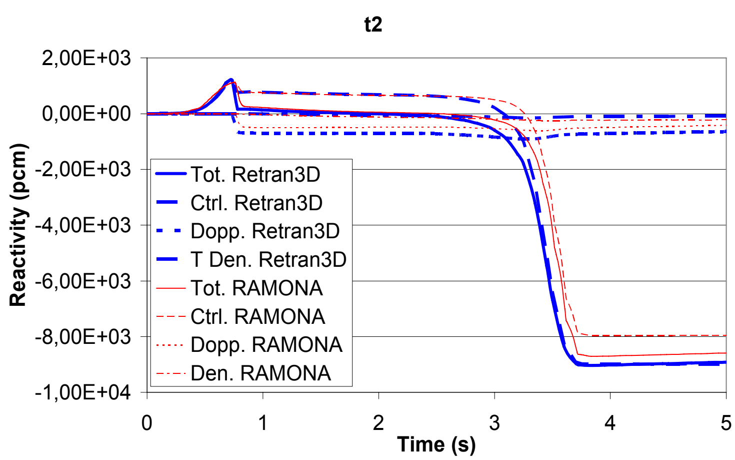

Figure 7. Case T2, Reactivities Comparison RETRAN-3D/RAMONA

Figure 6 shows the power history of Case T2 that is representative of the other cases. The power peak reaches the 18000 MW peak high enough for crossing the threshold of 120% of neutron flux and triggering the scram rod insertion after the corresponding delay of 0.65 s. The power peak is limited by the Doppler reactivity that lowers the power to 2000 MW. The scram insertion starts to be relevant and is responsible for reducing the reactor power to 0 MW.

Figure 7 shows the RETRAN-3D and RAMONA component reactivities for Case T2. The plot shows the ramp of reactivity produced by content central rod. The resulting fuel temperature increase yields a large negative step in Doppler reactivity that ends the initial pulse. The total reactivity at that time is slightly positive and decreasing slowly. Meanwhile the scram rods begin insertion and induce a negative reactivity that quickly shuts down the reactor. The comparison between RETRAN-3D and RAMONA is very good and both reproduce the CRDA phenomena. This plot shows the relative importance of the reactivity components. As shown, the control rod reactivity (dropped rod worth) is the most important during the early phase of the transient, and the Doppler is crucial for limiting the power pulse. The coolant density reactivity feedback is not as important as the Doppler or control rod reactivities during the transient. This is due to the large subcooling of the coolant that limits the formation of voids that could have an additional effect on the feedback.

Tables 4 and 5 summarize the behavior of the four cases reproduced with RETRAN-3D and show their comparison with RAMONA. Table 4 resumes the FWHM (full width half maximum) of the four cases and the difference in milliseconds. In Table 5 there is the behavior of the four cases in terms of power pulse amplitude (MW) and their respective relative difference.

Table 4. CZP Power Pulse width (FWHM) (ms)

Case	RETRAN-3D	RAMONA	Difference
T1	140	122	18
T2	35	41	6
T3	36	41	5
T4	36	41	5

Table 5. Max. Power Pulse (MW)

Case	RETRAN-3D	RAMONA	Relative Difference
T1	1795,8	1913,1	-0.06
T2	18436,4	16055,6	0.14
T3	18436,4	18323,5	0.006
T4	18436,4	18323,5	0.006

ROD WORTH LIMITS

The analyses were performed for a range of rod drop worths. The results of these have been used to establish a relationship between the dropped rod worths and the resulting enthalpy rise. In RIL-0401, the NRC-RES specifies the new limits of the fuel enthalpy applicable to the whole range of fuel burnup. For BWRs at CZP, the proposed enthalpy rise is 55 cal/g. For HZP and low oxidation levels (<70 microns), the enthalpy rise proposed is 80 cal/g.

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Figure 8 compares the fuel enthalpy rise versus the rod worth (in $) for Cofrentes NPP. This plot shows a linear behavior of the fuel stored energy versus the rod worth.

A bibliographic search of other BWR analyses performed by other organizations using different cores and codes resulted in remarkable agreement with the eight and is reproduced in Figure 9. This reinforces the adequacy of the analysis performed in this work with RETRAN-3D.

Using the results of Figure 9 a maximum rod worth values corresponding to the RIL-0401 limits could be defined in a similar way as were proposed for PWRs in the mentioned RIL-0401.

According to this, a rod worth limit of 1.5 $ would be adequate for a BWR at CZP conditions.

Additional sensitivity studies are in progress in order to evaluate the dependency of these limits on the initial and boundary conditions assumed in the analyses.

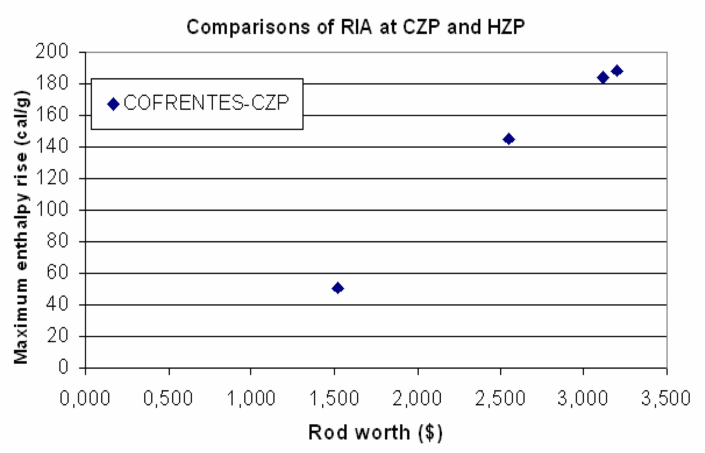

Figure 8. Cofrentes Worth Rod and Enthalpy

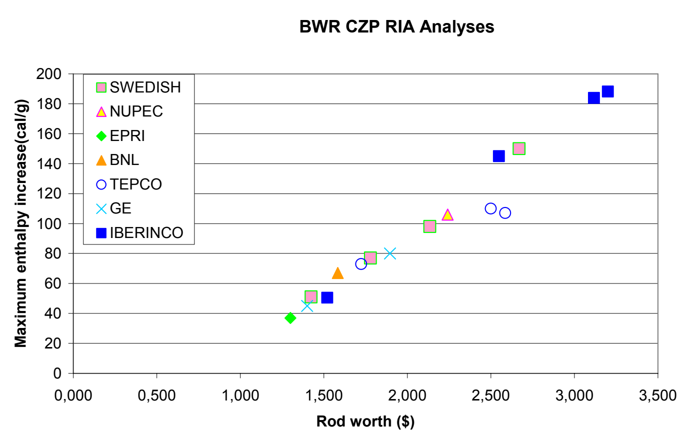

Figure 9. Worth Rod and Enthalpy Comparison

Number of Thermohydraulic Channels Sensitivity Run-Time Analysis

Coupled thermal-hydraulic neutronics codes generate and process a large amount of data, especially when a "one-for-one" core mapping is used. This ideal case of one thermal-hydraulic node for every neutronics node can require large memory requirements and execution time.

Due to memory limitations of the Iberdrola HP platforms it was not possible to model 624 RETRAN channels as a one-for-one configuration with the neutronics nodes. A sensitivity study was performed and it was found that the transient results did not change after a nodalization of 46 channels. Therefore, 46 RETRAN channels were used in this work.

As part of this study, the affect upon execution time of nodalization was undertaken for two HP platforms. Nodalization schemes from 14 to 156 channels were tested, where 156 channels represents a quarter-core model. These results are shown in Figure 10.

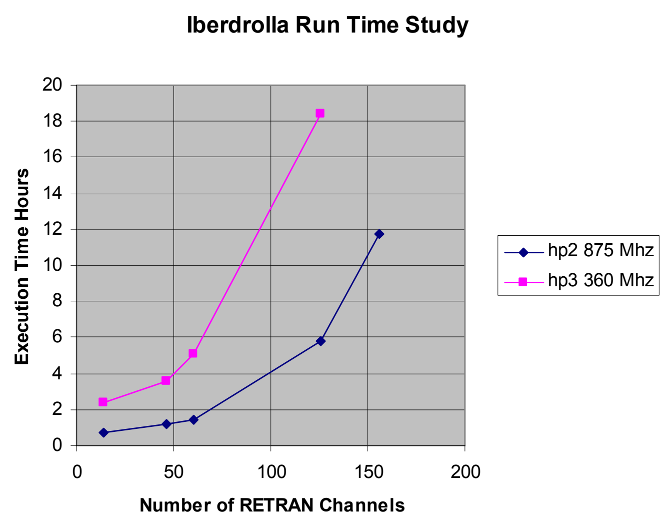

Figure 10. Sensitivity: Run Time vs. Number of Thermohydraulic Channels

It was observed that the execution time for this model was not a linear function of channel number. The behavior is more exponential. With this information one could project execution times for half-core or full-core models.

CONCLUSIONS

The significant effort that Iberdrola presented resulted in several conclusions of interest to RETRAN-3D users, particularly those that plan on using the RETRAN-3D kinetics option.

As a general conclusion, Iberdrola demonstrated that RETRAN-3D is adequate for simulating the BWR CRDA.

Iberdrola Reports Three-Dimensional Kinetics Analysis for BWR CRDA (Cont'd)

In terms of specific results, Iberdrola showed good comparisons between the RETRAN-3D steady-state kinetics option and SIMULATE-3. This gives Iberdrola additional confidence in the SIMTAB method for translating the cross sections and neutron kinetic parameters from SIMULATE-3 to RETRAN-3D and the physics models in RETRAN-3D.

They showed good results for power distribution, rod worths, and eigenvalues comparisons.

Good transient code-to-code comparisons between RETRAN-3D and RAMONA for CZP in terms of power pulse amplitude and power pulse width (FWHM).

Iberdrola also concluded that for this transient the fuel enthalpy rise versus the rod worth values in ($) a linear behavior. This is due to the lack of thermal-hydraulic feedback effects like the void formation caused by highly subcooled initial condition. According to these results the RIL-0401 enthalpy rise limits would translate to a BWR rod worth limits of 1.5 $ for CZP conditions. Iberdrola indicated that additional sensitivities studies are in progress to evaluate the viability of these limits.

Finally, Iberdrola showed that there is still a need to develop three-dimensional kinetics models that are optimized in size, due to execution time considerations. They showed that the run time correlates exponentially to the number of thermal-hydraulic channels of the model. In this case a model of 46 channels with a region well detailed around the falling rod and the rest modeled according their initial properties seems sufficiently practical and accurate to this simulation.

VIPRE Maintenance Transferred to CSA

VIPRE (Versatile Internals and Component Program for Reactors; EPRI) was developed by EPRI for nuclear power utility thermal-hydraulic analysis applications. It was designed to help evaluate nuclear reactor core safety limits including minimum departure from nucleate boiling ratio (MDNBR), critical power ratio (CPR), fuel and clad temperatures, and coolant state in normal operation and assumed accident conditions.

CSA operates the VIPRE User Group (VUG) for member organizations and EPRI. VUG members fund ongoing code maintenance and development activities to ensure the long-term viability of the code.

The VIPRE codes are available directly from CSA. For more information on the VIPRE programs and how they can be obtained, please contact:

Mark Paulsen or John Westacott
Computer Simulation & Analysis, Inc.
855 N. Capital, Suite #1
P. O. Box 51596
Idaho Falls, ID 83405
Telephone: (208) 529-1700
FAX: (208) 529-1723

RETRAN Training Sessions Draw Students Worldwide

The June RETRAN session at CSA involved seven individuals from six organizations representing a good cross section of the RETRAN user community. These were:

Toshiya Maeda, CSAJ
Greg Myers, FPL
Hiroshi Kawai, GISC
Rafael de la Fuente, Iberdrola
Sang Il Lee, KOPEC
Chris Comfort, SNOC
Susan Hoxie-Key, SNOC

In addition to the June training session, CSA conducted two training sessions at client locations. The list of graduates from these sessions include:

Dominion
Cary B. LaRoe (Supervisor)
Sama Bilbao y Leon
Joe O. Erb
Kurt F. Flaig
Mark C. Handrick
John C. Lautzenheiser
Noval A. Smith
Tommie L. Wheeler
Sophie Gutner
Delbert L. Horn
Todd R. Flowers

Westinghouse
Charles Simon
Isaac T. Wallace
Melinda J. Schwartz
Ryan P. Rossman
Edward M. Monahan
Mellissa A. Lucci
Cameron C. Martin
Allison A. Johnson
Ann E. Lane
Bernadette Degeye
Thibault Rensonnet
Annie Roty
Valerie Wilmart
Anthony R. Leshinskie
Joseph S. Nitkiewicz
Shamsul M. Abedin
Nicole Petro
Ed C. Ettinger
Tyler Upton
Eric Rogers
Sean Kinnas
Eedie Meliksetian
Andrea Cioncolini
Philip W. Rosenthal
Jennifer E. Moon
Daniel H. Risher
Ed L. Carlin
Justin M. Trbovich
Natalie R. Jurcevich
Matte D. Coury
Sandra V. Andre

Congratulations to all of the new RETRAN training graduates.

New RETRAN-3D Input Eliminates Counting Components

Nearly every RETRAN user has experienced the frustration of making changes to an existing deck, adding junctions, volumes or even edit variables, and then submitting several time consuming cases to get the 'problem dimension card' right.

This labor wasting activity will be a thing of the past thanks to a new feature of RETRAN-3D MOD004.1 that allows RETRAN to count the components internally. With the new option, a simplified problem dimension card (01000Y series) will eliminate all of the dimensions such as the number of volumes, junctions, conductors, pumps, or even minor edits.

There will only be 12 values required in the new format and these are used to select options such as slip model, numerical method choices, or power options.

The new option, when coupled with the existing RETRAN-3D feature of internal counting of control system input and control blocks, eliminates the need for the user to tell RETRAN the size of the model.

More information can be found in the RETRAN-3D User's Manual (Volume 3) regarding the option selection.

The 'historical' long form of the problem dimension card is also supported in RETRAN-3D MOD004.1 for those cases where deck modification for QA or control purposes is restricted.

Try the new option. It's a sure labor saver.

RETRAN/VIPRE User Group Meetings

The RETRAN and VIPRE User Group continued an active schedule of user group meetings with a Las Vegas Meeting in November 2004 and a meeting sponsored by ENN in May 2005. The meetings provided a blend of budget and project management issues with technical presentations.

In November 2004, Gregg Swindlehurst was elected the chairman of the RETRAN Steering Committee. Gregg replaces James Boatwright who guided the RETRAN program through a time of transition and uncertainty.

November 2004 in Las Vegas

The road to the second 2004 RETRAN and VIPRE User Group Meeting led to Las Vegas in November where individuals gathered to discuss the project status since the May 2004 meeting. Held at the spacious Luxor Hotel, the meeting had change as the central theme, for it represented change on many levels.

The meeting was attended by EPRI, 10 US utilities, four international organizations, and one US commercial vendor.

Frank Rahn of EPRI presented the 2004 financials for RETRAN and VIPRE. Starting in 2005, Computer

Andres Gomez, Iberdrola, Present 3-D Results

Simulation & Analysis will manage the funding and code maintenance of the RETRAN and VIPRE codes. EPRI stated that a Nuclear Analysis Methods Working Group (NAMWG) has been proposed and would consist of the chairmen of various groups such as GOTHIC and MAAP. The NAMWG would evaluate code modifications to determine the most suitable code for incorporation and to prevent duplication.

CSA summarized the RETRAN project status. The charter was finalized and RETRAN-02 was left out for commercial organization

fees to accommodate Westinghouse. There is still a concern that VIPRE fees may be prohibitive for Westinghouse participation. Southern Nuclear had some issues with the charter adoption, and the Chairman (James Boatwright) agreed to address each one in an email. James pointed out that once dues have been paid, participating organizations could request the current charter be changed to address any concerns.

The release of RETRAN-3D MOD004.1 was announced. This code version contains new models

Rafael Macian, PSI, and Andres Gomez, Iberdrola

and user-friendly enhancements. The new models include BWR leakage paths, enhanced grid loss models, variable junction inertia, and improvements to the control system, critical flow model, and bypass heating model.

The 2005 RETRAN work scope includes base support and maintenance. A list of candidate items for code development/improvements was presented. From these, the User Group identified developmental activities such as user guidelines/ conveniences and solution method/ code architecture improvements. Model improvements for enthalpy transport, bubble rise, and 3D kinetics storage were considered high priority.

RETRAN/VIPRE User Group Meetings (Cont'd)

The 2005 VIPRE work scope was also reviewed. A list of candidate items for code development/improvements was presented. A top priority was to survey Utilities to determine what changes have been made individually, and to try and establish a common code version. Edit enhancements and input error checking were also considered high priority.

Adel Alapour, SNOC, and Kent Halac, PSE&G

Utilities made formal and summary presentations of RETRAN and VIPRE activities:

- Entergy presented a benchmark of simulator predictions versus RETRAN. Similar trends were demonstrated between the two codes.
- AEP presented a RETRAN prediction of Appendix R cooldown, and demonstrated that 72 hours for cold shutdown could be achieved with two SGs.
- Duke provided a status of RETRAN/VIPRE activities and SLB at HFP. SLB at HFP is more limiting than HZP and Duke is considering including this in the FSAR. Also, to prevent fuel failures, Duke is investigating reverting to nonmixing vane grids.
- Texas Utilities will be replacing SGs with model D76 and is re-doing Chapter 15 analyses. LOCA and non-LOCA topicals will be submitted to the NRC.
- Southern Nuclear has submitted a 3D REA methodology to the NRC, however, the submittal is on hold due to a potential limit of 60 cal/gm. VIPRE analyses to address AOA are on going. Remote analysis through Westinghouse and GE are being considered.
- Dominion stated that their VIPRE topical was resubmitted after adding more descriptive text. Their reload code linkage is completely automated.
- PSE&G is incorporating RETRAN/VIPRE methodology acquired from Westinghouse. Salem SGs will be replaced in 2008 and simulator predictions are being benchmarked using RETRAN/LOFTRAN/RELAP.
- Westinghouse has on-going analysis for several utilities. An RAI for St. Lucie concerned "smart blackout".
- Status of RETRAN/VIPRE activity at Ameren/UE, South Texas Project, and WCNOC were also discussed.

Presentations from international participants included:

- CRDA for BWR using RETRAN-3D by Iberdrola,
- Development of Korean non-LOCA analysis package by KEPRI,
- VISA presentation by KAERI, and
- RETRAN/VIPRE applications at Paul Scherrer Institute (PSI).

Gregg Swindlehurst, Duke Energy, was elected the 2005-2007 Chairman and the following Steering Committee was appointed:

Andres Gomez, Iberdrola
Todd Flowers, Dominion
David Huegel, Westinghouse
Kent Halec, PSE&G
Adi Irani, Entergy Nuclear Northeast

The next RETRAN meeting is scheduled for May 2005 on the east coast. Entergy volunteered its facilities in White Plains or New Orleans.

Kyung Doo Kim's VISA Presentation

The retiring chairman, James Boatwright, TXU, was thanked for an outstanding job over the past few years.

RETRAN/VIPRE User Group Meetings (Cont'd)

May 2005 at ENN

The spring 2005 RETRAN/VIPRE User Group (RUG) Meeting was hosted by Entergy Northeast Nuclear (ENN) at their facility in White Plains, New York. Mr. Jerry Head, the ENN Manager of Nuclear Engineering & Analysis, welcomed the attendees and opened the meeting, which was attended by EPRI, seven U.S. utilities, one U.S. commercial vendor, one national laboratory, and CSA.

CSA presented a summary of the status of the RETRAN project. It included the current membership,

Dave Huegel, Westinghouse

project revenue from membership fees, and year-to-date expenses. CSA will contact organizations that have indicated that they may not be joining the RUG this year. The maintenance work performed this year was discussed along with work scope items for the remainder of the year. Preliminary budget, fee structure, and candidate work scope items for 2006 were identified. Members were asked to provide additional work scope items of interest so they can be finalized at the fall RVUG meeting. The modifications CSA made to RETRAN-02 for Westinghouse are candidates for

RVUG Steering Committee Chairman, Gregg Swindlehurst, Duke Energy

future RETRAN-3D model enhancements.

A discussion of the RETRAN-3D SER emphasized that new models that are not approved for generic use must be reviewed by the NRC prior to their use.

A summary of the VIPRE project was also presented by CSA. It included revenues from maintenance fees and carryover from EPRI maintenance for prior years, year-to-date expenses, and a summary of the work completed. CSA was directed to work with EPRI to determine the carryover from prior years that EPRI has not authorized for expenditure and to revise the spending authorization to include these funds. CSA will poll VUG members for recommended code enhancements and development work for the remainder of the year and 2006. They will also be requested to provide modifications that can be included in a common code version. Both Duke and Dominion expressed belief that due to the proprietary nature of the CHF correlations they use, there will be a need for organization specific versions.

The VIPRE users expressed a desire to have searchable electronic documentation. CSA will prepare estimates for preparing searchable electronic documents.

TXU and Dominion discussed a known error where the target DNB search results do not give the correct flow because the density is not updated during the search. They will provide input decks that demonstrate the error. A trouble report will be filed and the error corrected.

A number of organizational and RVUG charter issues were discussed. The proceedings of this meeting, including the presentations and a list of participants is available from CSA's website, http://www.csai.com/retran/summary.html.

Thanks to Entergy Nuclear Northeast for their hospitality and willingness to host the RVUG Meeting.

Yuki Fujita, AEP, John Westacott, CSA, Mark Paulsen, CSA, Gregg Swindlehurst, Duke Energy, Kevin Roland, TXU, Todd Flowers, Dominion, and Sama Bilbao y Leon, Dominion

About This Newsletter

RETRAN Maintenance Program

The RETRAN/VIPRE Maintenance Program is a program that provides for the support of software developed and maintained by CSA. The main features of the Subscription Service include:

- the code maintenance activities for reporting and resolving possible code errors,
- providing information to users through the User Group Meetings and this newsletter, and
- preparing new versions of RETRAN and VIPRE.

The RETRAN/VIPRE Maintenance Program now has 19 organizations participating in the program, including 13 U.S. utilities and 6 organizations from outside of the U.S. A Steering Committee, composed of representatives from the participating organizations, advises CSA on various activities including possible enhancements for the code and the scheduling of future code releases. Information regarding the Maintenance Program can be obtained from

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P. O. Box 51596
Idaho Falls, ID 83405
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Newsletter Contributions

The RETRAN/VIPRE Newsletter is published for members of the Subscription Service program. We want to use the newsletter as a means of communication, not only from CSA to the code users, but also between code users. If this concept is to be successful, contributions are needed from the code users. The next newsletter is scheduled for December 2005 and we would like to include a brief summary of your RETRAN and VIPRE activities. Please provide your contribution to CSA, P. O. Box 51596, Idaho Falls, ID 83405, or to the email addresses below by December 1, 2005. ***Contributors of a feature article will receive a RETRAN polo shirt.*** We are looking forward to hearing from all RETRAN and VIPRE licensees.

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The RETRAN web page is located at

http://www.csai.com/retran/index.html.

The VIPRE web page is located at

http://www.csai.com/vipre/index.html

Previous issues of the RETRAN/VIPRE Newsletter are available from the RETRAN or VIPRE web pages.

2005 Steering Committee Members

Gregg Swindlehurst, Duke Energy (Chairman), gbswindl@duke-energy.com
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Calendar of Events

User Group Meeting:
November 2005
Palo Alto, California
Details will be emailed to Maintenance Group Members