ANS THERMAL HYDRAULICS DIVISION NEWSLETTER

Spring 2007

Message from the Chair

The Thermal Hydraulics Division (THD) continues to remain a leading division of the American Nuclear Society that has many activities and technical programs to offer to its members.

Our Division has accomplished much during the last year. The THD Technical Achievement Award is now a national ANS award. An endowment fund for this award has been established. The THD sponsored or co-sponsored 5 contributed paper sessions and one panel discussion at the Winter Meeting in Albuquerque and will sponsor 7 sessions at the upcoming Summer Meeting in Boston. The high quality papers presented on timely issues at THD sessions continue to attract large audiences and stimulate lively discussion. In an effort to stimulate participation from the Division's younger members, the THD held its first Young Member's Competition, a special session in which the presentations and abstracts of young members in the thermal hydraulics field are critiqued by a panel of judges. At a special session of the 2006 Winter Meeting, the first winner of the Young Member's Competition was recognized along with the THD Technical Achievement Award and Best Paper recipients. The Division has updated its governing documents, complying with a request from ANS. Last, many THD members are in the process of organizing the Division's primary topical meeting, NURETH-12, which will be held September 30-October 04, 2007 in Pittsburgh, PA.

These successes would not have been possible without the strong enthusiastic support from members of the THD Executive Board and Special Committees. In particular, I would like to recognize the efforts being made by division members to organize the upcoming NURETH-12 meeting. The efforts being expended by the NURETH-12 organizers (Kurshad Muftuoglu, Lawrence Hochreiter, Fan-Bill Cheung, Jong Kim, and Karen Vierow) deserve special commendation. They, with strong support from key THD members, have assembled a meeting that includes TH experts for keynote and plenary speakers and papers from world renowned researchers on key TH topics. I'd like to encourage you to check the NURETH-12 website (www.nureth12.com) and register for this meeting!

Thank you again for the opportunity to serve as chair of the THD. I have enjoyed this opportunity to serve you. The THD is fortunate to have an impressive leadership team for the next year that includes: Prof. Shripad Revankar (Purdue University) as Chair, Dr. Chang Oh (INL) as Vice-Chair; Prof. Karen Vierow (Texas A&M) as Treasurer; and Prof. Kune Suh (Seoul National University) as Secretary. With this strong leadership, I'm sure that the THD will enjoy even more successes in the upcoming year. However, as in the past, these successes do depend on your participation. Please continue to offer the THD Executive Board your suggestions and assistance.

Joy Rempe, joy.rempe@inl.gov
2006-2007 Chair
ANS Thermal Hydraulics Division

TAA Nomination Solicitations

The THD Honors and Awards Committee is currently soliciting nominations for the THD Technical Achievement Award.

TAA Description:
The THD Technical Achievement Award is an annual award consisting of an engraved plaque with an appropriate citation and a monetary award of $1000. The Technical Achievement Award is presented at the ANS Winter Meeting or a Topical Meeting supported by the Division.

TAA Selection Method and Procedures:
Nominations for this award are made directly by the Division membership or others in the technical community. Nominations accompanied by at least three

supporting letters must be submitted in writing to the THD Honors and Awards Chair by July 1. The selection committee is the THD Honors and Awards Committee. Nominations are valid for three years from the date of submittal, but are only re-entered by the nominator sending an addendum, updating the original nomination or sending a letter requesting that their candidate be reentered on the next ballot.

Last fall, the ANS Honors & Awards Committee approved an application submitted by the THD to recognize the TAA as a national award. The ANS Board of Directors concurred. The THD TAA is now a national award which will be recognized at ANS Honors & Awards events.

Nomination packages should be submitted to:
Dr. Whee Choe, whee.choe@txu.com

Nomination forms are available at:
http://thd.ans.org/Awards/Awards.htm

Young Professional Thermal Hydraulics Research Competition Solicitations

The THD is sponsoring a special session entitled "Young Professional Thermal Hydraulics Research Competition" at the November 2007 ANS Winter Meeting in Washington, DC. This is the second installment of the highly successful session that was originally held in June 2006 in Reno, NV.

The professional development session is designed to enhance the technical writing and presentation skills of young professionals working in the area of Thermal Hydraulics through preparation and presentation of an abstract related to the Thermal Hydraulics profession. Accepted abstracts and presentations will be critiqued by a panel of judges that will provide constructive feedback on ways participants can improve their written and verbal communications skills in a technical forum.

All THD members who are less than 36 years old or have less than five years of experience working in the area of Thermal Hydraulics are encouraged to participate. A plaque will be awarded to the participant selected by the judging panel that gave the best oral presentation in the session. All experienced professionals who are interested in judging the presentations are asked to contact the session organizer, Donald Todd.

Finally, THD members are strongly encouraged to attend the session in November. Please come out and show your support to the next generation of engineers working in our field of Thermal Hydraulics. You might even learn a few things, too!

For more information, please see the link below or contact Donald Todd at donald.todd@areva.com

http://thd.ans.org/YP-THRC.doc

Honors and Awards Committee Report

The Thermal Hydraulics Division Honors & Awards Committee presented the following 2006 THD awards at the ANS 2006 Winter Meeting.

2006 THD Technical Achievement Award
Professor Fan-Bill Cheung
Department of Mechanical and Nuclear Engineering
The Pennsylvania State University

The Technical Achievement Award is the highest award given by the THD. It is presented annually to a member of the THD in recognition of outstanding past or current technical achievement. It is based on a major contribution to the state of the art, an important publication, a major technical achievement, or a sustained record of accomplishment and technical excellence in the art or science of thermal hydraulics.

The 2006 TAA was presented to Professor Fan-Bill Cheung for his outstanding contributions to the fundamental understanding of critical heat flux for downward facing boiling, degraded core heat transfer, turbulent convection in a volumetrically heated layer, and thermal hydraulic phenomena of importance to nuclear reactor safety, and for his significant impact on the thermal hydraulics community as a researcher, educator, and leader promoting technical excellence and international scientific exchanges.

Recipients for the THD awards were honored at the THD Awards ceremony at the 2006 ANS Winter Meeting. During this event, Professor Cheung delivered his TAA Lecture entitled, "Enhancement of Critical Heat Flux for Downward Facing Boiling".

2006 ANS THD Best Paper Award
"The 2005 CHF Look-up Table", D. C. Groeneveld, J. Q. Shan, A. Z. Vasic, L. K. H. Leung, A. Durmayaz, J. Yang, S. C. Cheng, A. Tanase.

Published in the Proceedings of the 11th International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-11), Popes Palace Conference Center, Avignon, France, October 2-6, 2005.

2006 ANS THD Young Professional Thermal Hydraulics Research Competition
Jeffrey Kobelak, Westinghouse
"Thermal Hydraulics Differences in Application of ASTRUM to 2-, 3-, and 4- Loop Plants," for presentation at the ANS Annual Meeting in Reno, NV, June 2006.

New ANS THD Fellow
Dr. Cetin Unal
Los Alamos National Laboratory

Finally, we are pleased to announce that one of our long-time contributors to the THD, Dr. Cetin Unal, has been selected as an ANS Fellow for his distinguished career in nuclear thermal hydraulics safety research, development of reactor thermal hydraulics and safety codes, waste management research, development of unique measurement techniques for nuclear waste, safety analysis of nuclear facilities and defense nuclear reactors, fundamental modeling of saturated nucleate boiling and critical heat flux and weapon certification methodologies including the quantification of margins and uncertainties in weapon performances.

Jong Kim, jkim@epriww.com
2006-2007 Chair
THD Honors & Awards Committee

Treasurer's Report

For FY 2007, the Division's income of $17,996 comes from the FY 2006 carry forward and our member allocation. THD expenses are from support for the student conference at Oregon State University in April 2007, student travel support to the ANS Annual Meeting (June 2007) and the ANS Winter Meeting (November 2007), and scholarships including the NEED program.

Revenue		
Type	**Item**	
Member Allocation	$1/THD Member	867
Carry Forward from 2006		17,129
TOTAL REVENUE		**17,996**
Expenses		
Type	**Item**	
Student Conference Support	Oregon State Univ. meeting	3,000
Student Travel Support	June 07 Meeting	250
Student Travel Support	Nov. 07 Meeting	250
Scholarship/NEED	Scholarship/NEED and THD award support	500
TOTAL EXPENSES		**4,000**
Balance as of 8/31/06		**13,996**

Chang Oh, chang.oh@inl.gov
2006-2007 Treasurer
ANS Thermal Hydraulics Division

Program Committee Report

The Division's strong support at the national meetings continues. The Thermal Hydraulics Division organized 5 contributed paper sessions and one panel discussion at the Winter Meeting in Albuquerque.

For the 2007 Annual Meeting in Boston, the THD is sponsoring sessions with the following topics. Based on the content of received summaries, good discussions are anticipated in every session.

- Uncertainty Treatment in Nuclear Science and Engineering [Organizer: Robert P. Martin (AREVA NP)] (Monday PM) 4 papers
- Nanofluids, Surfactants and Particles in Thermal Hydraulics (Tuesday AM) 7 papers
- General Thermal Hydraulics [Organizer: Joy Rempe (INL)] (Tuesday PM) 6 papers
- Thermal Hydraulics of Steam Generators (Wednesday AM) 3 papers
- Computational Thermal-Hydraulics [Organizer: Yassin Hassan (Texas A&M)]

Session I (Wednesday AM) 4 papers, Session II (Thursday AM) 5 papers
- Thermal Hydraulics of Generation IV Systems [Organizer: Fan-Bill Cheung (Penn State)] (Wednesday PM) 8 papers

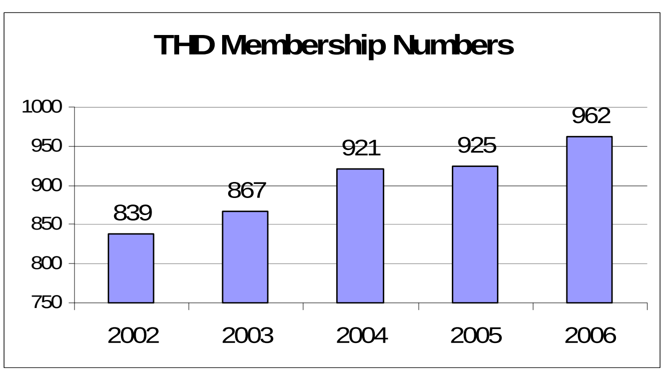
For more information, please visit the ANS website: http://www.ans.org/meetings/index.cgi?c=n. To receive more information on THD meeting activities, to propose a session, or to help with paper reviews, please contact the Division's Program Committee chair.

Kurshad Muftuoglu, muftuoak@westinghouse.com
2006-2007 Chair
THD Program Committee

Membership Committee Report

Of the 10,772 ANS members, 962 members have selected the THD as one of their professional divisions. As the chart below demonstrates, the THD is showing strong growth. As a reference, membership in the THD peaked in 1993 with 1184 members. As a consequence of an aging workforce and our industry's recession through the rest of 90s, our membership reached a minimum of 691 in 1999. Thankfully, we have weathered that storm with several successful topical meetings and the excitement in nuclear and nuclear thermal-hydraulics has returned. With strong thermal-hydraulic programs planned for the next couple of years (i.e., NURETH-12 and NUTHOS-7), we expect to cross the 1000 member threshold in the very near future!

Robert Martin, robertp.martin@areva.com
2006-2007 Chair
THD Membership Committee



NURETH-12 Announcement

The 12th International Meeting on Reactor Nuclear Thermal Hydraulics (NURETH-12) will be held from September 30 to October 4, 2007, at the Sheraton Station Square in Pittsburgh, Pennsylvania. The website for more information and abstract submission is at www.nureth12.org. We have a strong Technical Program Committee with experts in all areas of the conference topics. The key dates are as follows:

Electronic Submission of Abstracts	March 2, 2007
Author Acceptance Notification	March 15, 2007
Submission of Full Papers	March 31, 2007
Comments to the Authors	May 15, 2007
Final Paper Deadline	July 1, 2007
Author Registration Deadline	August 15, 2007
Early Registration/Hotel Reservation	August 31, 2007
Conference:	**September 30-October 4, 2007**

Kurshad Muftuoglu, muftuoak@westinghouse.com
NURETH-12 Assistant General Chair

Recent Developments on ESBWR Thermal-Hydraulics and Safety Analyses

Pradip Saha, pradip.saha@ge.com
Bharat Shiralkar, Yee Kwong Cheung, Wayne Marquino

The ESBWR is a 4500 MWt reactor that uses natural circulation for normal operation and has passive safety features. Some of the early natural circulation BWRs (e. g., Dodewaard at 183 MWt and Humboldt Bay at 165 MWt) provided valuable operating data and experience. After several decades of successful forced circulation BWR design, construction and operation, GE is now offering the large natural circulation ESBWR to produce a simpler, safer, more reliable, and more economical nuclear power plant [1]. Most of the components in the ESBWR are standard BWR components (steam separators/dryers, control rods and guide tubes, core support structures, etc.) that have been operating in the field for years. The main difference is the taller Reactor Pressure Vessel (RPV), which provides the additional driving head for natural circulation flow through the core, as well as a larger water inventory for a postulated Loss-of-Coolant Accident (LOCA). Additional steam in the RPV also provides a cushion during pressurization transients, leading to a softer response with no Safety Relief Valve (SRV) discharge.

The operating parameters of the ESBWR are within the range of operating BWR plant data. Although the power/bundle and flow/bundle for the ESBWR are both lower than that for a modern jet pump plant at rated operating conditions, yet the ratio of power to flow is similar to that for an uprated BWR at Maximum Extended Load Line Limit Analysis Plus (MELLLA+) conditions. GE uses the state-of-the-art, extensively validated TRACG code [2], approved by the NRC staff for analyzing ESBWR LOCA and stability performance. The enhanced natural circulation flow rate in the ESBWR greatly improves stability performance relative to the operating BWRs at natural circulation conditions [3]. Thus ESBWR is a very stable reactor that easily meets the very conservative design/licensing criteria. In addition, TRACG simulations of ESBWR startup have demonstrated that at expected heatup rates, the startup can be accomplished without difficulty [4].

The ESBWR incorporates advanced, passive safety features, namely, the Isolation Condenser System (ICS), Gravity-Driven Cooling System (GDCS), and Passive Containment Cooling System (PCCS) as shown in Figure 1. The ICS, consisting of four passive high-pressure loops, each containing a heat exchanger that condenses steam on the tube side, is used for high-pressure inventory control and decay heat removal under isolated conditions. Postulated loss-of-coolant accidents (LOCA) are mitigated by rapid depressurization of the RPV by the automatic depressurization system (ADS) followed by gravity-driven water flow from the GDCS pool into the RPV. Scaling studies [5] have shown that the test data obtained from the sub-scale integral facilities, GIST and GIRAFFE-SIT, are still applicable to the ESBWR LOCA situations. Finally, the PCCS consisting of six safety-related passive low-pressure loops provides long-term containment heat removal following a LOCA.

TRACG analyses [6] show that even for the limiting LOCA event: (1) the reactor core remains covered with large margin and there is no fuel heatup in the ESBWR, and (2) the long-term containment pressure increases gradually over several hours, and the peak pressure remains below the design value with large margin. Even the most limiting Anticipated Transients Without Scram (ATWS), i.e., All Main Steam Isolation Valve (MSIV) closure with failure to scram, can be mitigated at high pressure without exceeding the ASME Code emergency limit and the pressure suppression pool from heating to its design limit [7]. The automatic feedwater flow reduction reduces the vessel water level, which in turn reduces the reactor power to approximately one-quarter of the initial value. Finally, the reactor is brought to the sub-critical state by boron injection into the core bypass region from two Standby Liquid Control System (SLCS) accumulators, and the ICS alone is able to condense the steam generated by core decay heat and terminate the pressure suppression pool heatup.

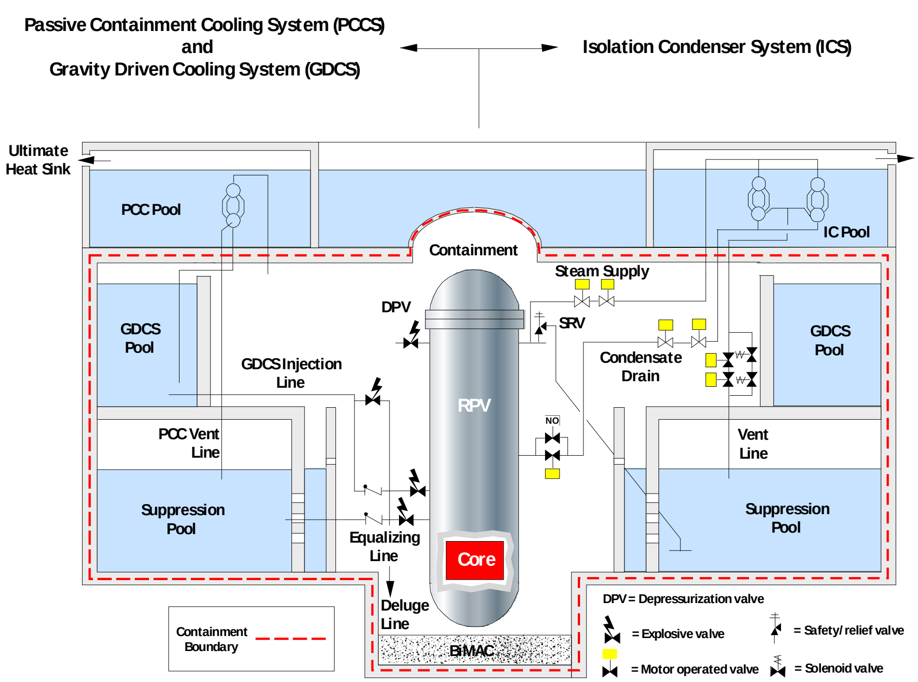


Fig. 1 ESBWR with its Passive Safety Features

In conclusion, GE's 4500 MWt ESBWR is a simple natural circulation BWR, which is very stable during normal operation. A smooth plant startup can be achieved following the appropriate procedure and heatup rate. With the passive safety features, i.e., the ICS, GDCS and the PCCS, the ESBWR will not experience any core heatup during a LOCA and the long-term containment pressure will remain well below the design value. Even the most limiting ATWS event can be mitigated with comfortable margin. Work is in progress to provide additional operational flexibilities by variation of the feedwater temperature.

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Acknowledgements

This material is based upon work supported by the U.S. Department of Energy under a Subaward to Award No. DE-FC07-05ID-14635, a Subaward to Award No. DE-FC07-05ID-14636, and Award Number DE-FC07-07-ID-14778.

International Nuclear Engineering Research Initiative Project at INL and KAIST

C. H. Oh, chang.oh@inl.gov

E. S. Kim (INL), H. C. No (KAIST)

The very high-temperature gas-cooled reactor (VHTR) is envisioned as a single- or dual-purpose reactor for electricity and hydrogen generation. The concept has average coolant temperatures at 900°C and operational fuel temperatures above 1250°C. The concept provides the potential for increased energy conversion efficiency and for high-temperature process heat application in addition to power generation. While the VHTR concept has sufficiently a high temperature to support process heat applications, such as coal gasification, desalination or cogenerative processes, the VHTR's higher temperatures allow broader applications, including thermochemical hydrogen production. However, the very high temperatures of this reactor concept can be detrimental to safety if a loss-of-coolant accident (LOCA) occurs. Following the loss of coolant through the break and coolant depressurization, air will enter the core through the break by molecular diffusion and ultimately by natural convection, leading to oxidation of the in-core graphite structure and fuel. The oxidation will accelerate heatup of the reactor core and the release of toxic gasses (CO and CO_2) and fission products. Thus, without any effective countermeasures, a pipe break may lead to significant fuel damage and fission product release. Prior to the start of this Korean/United States collaboration, no computer codes were available that had been sufficiently developed and validated to reliably simulate a LOCA in the VHTR. Therefore, we have worked for the past three years on developing and validating advanced computational methods for simulating LOCAs in a VHTR.

Governing Equations

The GAMMA code was developed specifically for air ingress analysis of the VHTR as part of a ROK/US I-NERI project [1]. The governing equations and numerical methods adopted for this project are described below.

The multi-dimensional governing equations for a chemically reacting flow [2] consist of the basic equations for continuity, momentum conservation, energy conservation of the gas mixture, and the mass conservation of each species. Six gas species (He, N_2, O_2, CO, CO_2, and H_2O) are considered in the present analytical model, and it is assumed that each gas species and the gas mixture follow the equation of state for an ideal gas. The GAMMA code has the capability to handle the thermo-fluid and chemical reaction behaviors in a multi-component mixture system as well as heat transfer within the solid components, free and forced convection between a solid and a fluid, and radiative heat transfer between the solid surfaces. Also, the basic equations are formulated with a porous media model [3] to consider heat transport in a pebble-bed core) as well as solid-fluid mixed components.

The continuity, momentum and sensible energy equations are formulated for the gas mixture in [1], along with the continuity equation for each gas species. For a solid and a pebble bed, the same heat conduction equation is used. A thermal non-equilibrium model for porous media is used to consider the heat exchange between the fluid and the pebbles.

Radiative heat transfer in the enclosure is well-modeled by using an irradiation/radiosity method [4] which assumes that the fluid is non-participating and the radiation exchange between surfaces is gray and diffuse. The net radiative flux from agglomerated surface k, which consists of N_k faces of the original mesh, is given by:

$$\begin{aligned} q''_{rk} &= \left[\left(\sum_{j\neq k}^{M} F_{kj}\right)\varepsilon_k \overline{T}_k^{\,4} - \varepsilon_k \sum_{j\neq k}^{M} F_{kj} J_j\right]\left[\varepsilon_k + \left(1-\varepsilon_k\right)\sum_{j\neq k}^{M} F_{kj}\right]^{-1} \\ J_j &= \varepsilon_j C_j \sigma \overline{T}_j^{\,4} + \left(1-\varepsilon_j\right) C_j \sum_{i\neq j}^{M} F_{ji} J_i \end{aligned} \qquad (1)$$

The ordinary diffusion flux (J_s) is given in two forms, the full multi-component diffusion [5] and the effective diffusion [6] by the assumption that a dilute species, s, diffuses through a homogeneous mixture:

$$\mathbf{J}_s = \rho \frac{W_s}{W^2} \sum_{k=1,k\neq s}^{m} \left[D_{sk} \nabla \left(Y_k W \right) \right] \qquad (2)$$

$$\mathbf{J}_s = -\rho D_{s-mix} \nabla Y_s \quad where \;\; D_{s-mix} = \left(\sum_{k=1,k\neq s}^{m} X_k / \mathbb{D}_{sk} \right)^{-1} \quad (\mathrm{m} \geq 3) \qquad (3)$$

Although Eq. (2) predicts the accurate diffusion behaviors of species in a multi-component mixture, Eq. (3) is generally used in numerical calculation because of its computational efficiency and its accuracy close to that of Eq. (2). Physical properties, such as molar weight, viscosity, thermal conductivity, and sensible enthalpy, for each gas component and gas mixtures, are obtained from the handbooks of gas properties [7-8].

Verification

The GAMMA code was used for analyzing the air ingress accident following a double-ended break of the coaxial pipes for a pebble-bed gas-cooled reactor. We selected the 268MWt PBMR [9] as a reference reactor and performed sensitivity analyses on the air volumes in a vault, the onset timings of natural convection, and the coupling of a vault and the reactor coolant system. We assumed that in the 268MWt PBMR, helium at 500^{o}C and 7 MPa enters the pebble core through the riser holes and exits at 900^{o}C and a flow rate of 129 kg/s. Figure 1 shows the schematic diagram of the PBMR and its arrangement in a reactor cavity. The circular pebble-bed core consists of approximately 333,000 fuel spheres and 110,000 graphite spheres in the central reflector zone. The water-cooling RCCS installed in a reactor cavity removes passively the core decay heat.

Figure 2 shows the GAMMA modeling of the PBMR where 2-D geometry models are used for the pebble core and the reactor cavity to consider heat removal by natural convection flow, and for all the solid structures including the pebbles to consider multi-dimensional heat conduction. In all the cavities or plenums, the radiation heat exchanges are considered. For the water cooling

RCCS, a constant temperature of 80°C is assumed to be maintained during the transient. Following the accident, since a reactor trips immediately, the core power is determined directly from the German decay heat curve.

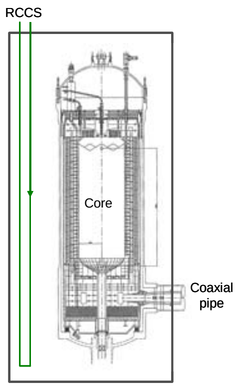

Figure 1 Schematic diagram of PBMR 268 MWt

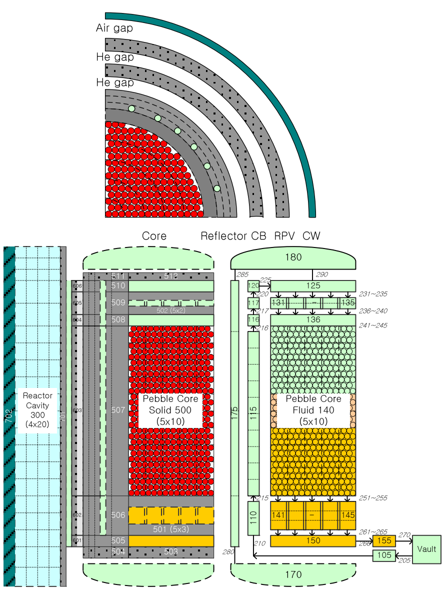

Figure 2 GAMMA nodal scheme for 268 MWt PBMR

The base case run has been performed with the air volume of 50,000 m^3 (German HTR-module data) in a vault.

Figure 3 shows the temperature profile of the VHTR core system based on the vault volume of 50,000 m^3 used as a parametric study. The detailed results are shown in our final report [1].

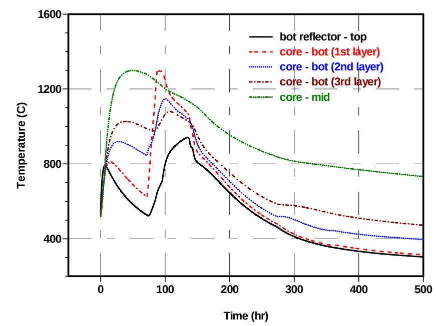

Figure 3. Core and reflector temperatures for the PBMR (V_{air}=50,000 m^3).

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50 Years in Nuclear Power: A Retrospective, by Salomon Levy

Dr. Salomon Levy, respected engineer, researcher, consultant, *Nuclear Engineering and Design* editor and contributor to the Thermal Hydraulic Division, has put his experiences and insights down on paper. Available

June 1, this book describes Dr. Levy's many significant experiences over a period of 50 years in the field of nuclear power generated electricity. The first 25 years deal with the development, design, safety, manufacturing, licensing, and operations of light water reactors and particularly of General Electric (GE) boiling water reactors. The subsequent 25 years cover the formation and operation of engineering/management firm, S. Levy Incorporated (SLI), which provided consulting services to the entire nuclear industry. Please visit the ANS book sales table at national meetings or order online at the ANS Store.

http://www.ans.org/store/

Update on THD Governing Documents

To address problems within outdated division governing documents, the national ANS Bylaws & Rules Committee has formulated a new, "Standard Bylaws for Divisions or Technical Groups" that each division must adopt (with minor modifications, such as the name of their division). As noted in the THD Fall newsletter, the THD Executive Committee (EC) discussed these Bylaws and other existing THD governing documents at our Winter meeting. The EC voted to adopt the version of the Standard Bylaws that is now posted on the THD website. In addition, the EC has adopted the updated version of the THD Rules that is also now posted on the THD website, which document the responsibilities of each THD officer and of THD standing committees and their officers. The THD website also contains two additional governing documents, the Manual and the Procedures. The Manual for the THD, which was last updated in 1988, provides historical information about the THD, its mission, it organization, and it honors and awards. The Procedures, which were last updated in 1988, provides more detailed information about the process that must be followed by THD officers with respect to financial transactions and records, meeting reporting requirements, the selection and administration of THD awards, and the coordination of THD topical meetings. As you can imagine, some of the information in the existing Manual and Procedures is outdated because these documents haven't been updated since 1988. At the upcoming Annual Meeting, a draft updated Procedures, which encompasses information from the existing Procedures and Manual, will be discussed. If you have any concerns or comments, please notify one (or all) of the THD members prior to our June Executive Committee meeting.

Executive Committee
ANS Thermal Hydraulics Division

Nominating Committee Report

The results of the recent ANS elections are in. We have the following new Division Officers and Executive Committee members.

Division Chair: Dr. Shripad Revankar
School of Nuclear Engineering, Purdue University
shripad@ecn.purdue.edu

Vice Chair/Chair Elect: Dr. Chang Oh
Idaho National Laboratory
chang.oh@inl.gov

Treasurer: Dr. Karen Vierow
Dept. of Nuclear Engineering, Texas A&M University
vierow@ne.tamu.edu

Secretary: Dr. Kune Y. Suh
Dept. of Nuclear Engineering, Seoul National University
kysuh@snu.ac.kr

Executive Committee (3 year term)
Dr. Kurshad Muftuoglu
Westinghouse Co.
muftuoak@westinghouse.com

Dr. Xiaodong Sun
Nuclear Engineering Program, Ohio State University
sun.200@osu.edu

Current Year THD Officers:

Division Chair: Joy Rempe, *joy.rempe@inl.gov*
Vice Chair: Shripad Revankar, *shripad@ecn.purdue.edu*
Treasurer: Chang Oh, *chang.oh@inl.gov*
Secretary: Karen Vierow, *vierow@ne.tamu.edu*

Executive Committee Members

Chang Oh (2007)	*chang.oh@inl.gov*
Karen Vierow (2007)	*vierow@ne.tamu.edu*
Jong Kim (2008)	*jkim@epriww.com*
Fan-Bill Cheung (2009)	*fxc4@psu.edu*
Whee Choe (2009)	*whee.choe@txu.com*
Yassin Hassan (2009)	*y-hassan@tamu.edu*

Hisashi Ninokata (2009) *hninokat@nr.titech.ac.jp*
Don Todd (2009) *donald.todd@areva.com*

In addition, this year we have added the following new members to the Program Committee

Cesare Frepoli, Westinghouse Co.
Donna Guillen, Idaho National Laboratory
Theron Marshall, Idaho National Laboratory
Brian Woods, Oregon State University
Steven Arndt, US Nuclear Regulatory Commission
Pradip Saha, General Electric

The Nominating Committee is responsible for the nomination of THD members to leadership positions on both the Program and Executive Committees. The THD would like to encourage members interested in becoming more involved to contact one of the officers listed above. In particular, the division is usually in need of volunteers for technical meeting session organizers and paper reviewers.

Bob Martin, robertp.martin@areva.com
2006-2007 Chair
THD Nominating Committee

Newsletter edited by
Karen Vierow, vierow@ne.tamu.edu
2006-2007 Secretary
ANS Thermal Hydraulics Division