



THERMAL HYDRAULICS DIVISION NEWSLETTER

Fall 2005



Message from the Chair

It is an exciting time to be part of the ANS Thermal Hydraulics Division! Thanks to a resurgence of interest in nuclear power and a string of very success international thermal-hydraulics topical meetings, contribution by both old and new members is fueling an enthusiasm in our division that has exceeded expectations. As a result, membership continues to rise, the division is financially strong and opportunities for our membership to contribute are plentiful.

The ANS THD and the Société Française de l'Energie Nucléaire just recently held the NURETH-11 meeting in Avignon, France (see story elsewhere in this newsletter). This was a highly successful meeting following two other recently held international thermal-hydraulic meetings: NURETH-10 in 2003, and NUTHOS-6 in 2004. The quality and breadth of work being presented at these meetings is remarkable. New work is appearing across the spectrum of thermal-hydraulic topics including fundamental two-phase flow, CFD, thermal-hydraulics modeling, boiling heat transfer, scaling, containment analysis, severe accidents, computer code assessment, and gas reactors experiments and system modeling

While much of this relates to development in the area of new light water reactor systems and interest in Gen IV concepts, there continues to be a healthy contribution in basic thermal-hydraulics research and technical support for current generation nuclear power plants. While the program for the 2005 ANS Winter Meeting is set, there is still time to contribute to the 2006 ANS Annual Meeting in June to be held in Reno, NV. The Reno meeting includes the 2006 International Congress on Advances in Nuclear Power Plants (ICAPP) meeting. Be sure to check out both the ANS (<http://www.ans.org/>) and ANS THD (<http://thd.ans.org/>) websites containing the most current information pertaining to our division's activities.

Robert P. Martin

Chairperson (2005-2006)
Thermal-Hydraulics Division



NURETH-11 A Great Success!

The NURETH-11 meeting was held October 2-7 within the confines of the historic Palais des Papes (Popes' Palace) in Avignon, France. The NURETH meeting series is the premier international thermal-hydraulics technical conference held every 2-4 years. The ANS Thermal-Hydraulic Division is the primary sponsor of this meeting and either a domestic local ANS section or international professional division serves as host. The format of this meeting, like similar large-scale technical meetings, involved a mix of plenary lectures by recognized thermal-hydraulic leaders and technical sessions by contributing authors.

There were nearly 500 meeting registrants representing approximately 31 countries. While the French nuclear organizations, AREVA, IRSN, EDF, and CEA, served as major sponsors, the meeting was well attended by most of the larger nuclear organizations around the world, including the USNRC, Westinghouse, AECL, and several European and Asian regulatory and utilities. Presentation of nearly 400 papers plus additional presentations appearing in two special topics sessions provided the technical portion of the meeting.

The meeting was particularly unique in that it attracted several long time technical leaders in the field of thermal-hydraulics. Dr. Graham Wallis, professor emeritus at Dartmouth University and Chairman of the USNRC's Advisory Committee on Reactor Safeguards, provided a plenary presentation; Dr. Richard Lahey, professor emeritus at Rensselaer Polytechnic Institute, also provided a plenary presentation; and Dr. Novak Zuber, retired USNRC, was presented a Medal of Honor from the Société Française de l'Energie Nucléaire for his lifetime achievements.

The diversity of the subject matter is usually best at international meetings and the NURETH-11 meeting was no exception. The meeting began with Graham Wallis' plenary on "Uncertainties and Probabilities in Nuclear Reactor Regulation". This was a fascinating presentation about how

one regulatory agency has struggled to translate statistical measures into regulation. Specifically, this related to establishing appropriate coverage for the multi-variant LOCA acceptance criteria (i.e., PCT, maximum local oxidation, and core wide oxidation). The second plenary presentation, provided by Prof. Lahey, explored the experimental and analytical evidence supporting the observed production of neutrons and tritium due to thermonuclear fusion within imploding bubble clusters.

The highlight of the meeting was the gala banquet held within one of the grand halls of the Popes' Palace. The highlight of the banquet was a speech by Jacques Bouchard, formerly Director of the Nuclear Energy Division and now special advisor to the Administrateur Général of CEA and the presentation of the Société Française de l'Energie Nucléaire Medal of Honor to Dr. Novak Zuber for "scientific and technical contribution in the field of nuclear thermal-hydraulics" and his "contribution to the two-phase flow modeling."

The ANS Thermal-Hydraulic Division is indebted to the meeting host the Société Française de l'Energie Nucléaire for selecting such a wonderful venue and providing perfect weather. In addition, the efforts of all the authors, session chairs, and reviewers were invaluable to the meeting's ultimate success.

Robert Martin
NURETH-11 Steering Committee

2005 ANS THD Awards

Thermal Hydraulics Division (THD) offers several awards each year; Distinguished Service Award, Best Paper Award, and Technical Achievement Award.

The Technical Achievement Award is the highest award given by the THD. It is normally 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.

On behalf of the ANS/THD Honors & Award Committee, I am very pleased to report that this year's competition was very exciting and very close between highly qualified candidates. Therefore, the H&A committee, with the approval of ANS THD executive committee, decided to honor two distinguish individuals for the technical achievement award; Prof. Vijay Dhir and Dr. William T. Sha.



Prof. Vijay Dhir

The technical achievement award is presented to Prof. Vijay Dhir in recognition of his outstanding contributions to phase change heat and mass transfer, two phase flow and thermal hydraulics of nuclear systems through the study of hydrodynamic theory of the peak heat flux in boiling, two phase flow in porous media and coolability of heat generating porous beds, the quenching of Zircaloy clad rod bundles, the modeling of reflood heat transfer phase of the large LOCA design base accident, the stratification in sodium cooled fast reactors, and the modeling of nucleate boiling and developing numerical analyses to describe the complex processes occurring at the surface.



Dr. William T. Sha

Dr. William. T. Sha receives the Technical Achievement Award in recognition of his many outstanding and unique contributions to the field of two phase flow and nuclear reactor design and safety analysis through the development and application of novel computational techniques for analyzing thermal hydraulic behavior and phenomena, the development of novel porous media formulation of governing conservation equations used in the COMMIX code, the development of the boundary-fitted coordinate transformation method used in the BODYFIT code.

The Best Paper Award is given annually for the best full paper presented at one of the previous Division-sponsored thermal hydraulics sessions or topical meetings. The award is made on the basis of originality, creativity, impact and scientific integrity. Recommendations for the Best Paper Award come from chairs of technical meeting sessions and from members at-large (through the Program Committee Chair).

This year's best paper award is from the NUTHOS-6 conference. The award was given to E. Baglietto and H.

Ninokata for their paper entitled “CFD Modeling of Secondary Flows in Fuel Rod Bundles”.

The Distinguish Service Award is given to THD members, officers, and individuals who significantly contributed to the division activities. No nominations were received by the THD for this award this year. If you’d like to recognize someone for this award, please send your nomination to any of the officers or a THD H&A committee member (contact information provided elsewhere in this newsletter).

The ANS/THD Technical Achievement awards ceremony will be held at the upcoming 2005 ANS Winter Meeting on November 14, 4-7 pm. The ceremony is tentatively schedule for the Governors Boardroom following the panel session on Risk-Informed Revisions to 10 CFR 50.46. Flyers will be posted in the Registration Area confirming the ceremony location.

As a final note, ANS Honors and Awards Committee awards, in responding to an insufficient number of nominations for the many larger society awards, is soliciting the help of all ANS members in identifying potential candidates. The list of these awards can be found on the ANS web page (<http://www.ans.org/honors>).

Cetin Unal

ANS/THD Honors & Awards Chair

Report on the THD Program Committee

Program committee activities mainly involve organization of topical meetings and support to ANS national meetings. The major topical meeting of 2005 was NURETH. The Eleventh International Meeting on Nuclear Reactor Thermal-Hydraulics was held in Avignon, France between October 2 and October 6. There was a large participation with more than 300 papers presented. Overall, this was a very successful meeting. The organization committee was lead by Hervé Lemonnier and Jean-Claude Bouchter. At the closing, the first announcement for NURETH-12 was made.

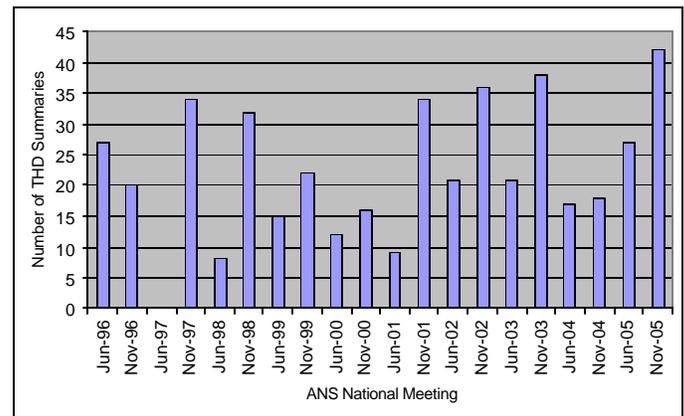
NURETH-12 will be held in 2007 in Pittsburgh, Pennsylvania. The conference dates are September 30 through October 4. The ANS Pittsburgh Section is hosting the meeting. The general chair of the meeting is Prof. Hochreiter and the technical program chair is Prof. Cheung. The call-for-papers is to be issued next January.

The ANS Annual Meeting was held in San Diego, California at the Town and Country Resort and Convention Center from June 5 to 9, 2005. Our strong support to the national meetings continues. We have sponsored 4 sessions. There were 28 papers presented at these sessions.

The ANS Winter Meeting will be held at the Omni Shoreham Hotel at Washington, D.C. between November 13 and 17, 2005. The THD is sponsoring 6 contributed paper sessions and a panel discussion session. We have received 42 summaries. The panel discussion is titled “Risk Informed Revisions to 10CFR50.46”. Experts from industry and academia will discuss the up-coming changes to the acceptance criteria for ECCS performance.

The ANS 2006 Annual Meeting will be held in Reno, Nevada. We are organizing 5 sessions in the meeting; they are: Nuclear Hydrogen Systems, Thermal Hydraulics Aspects in Nuclear Space Propulsion, General Thermal Hydraulics, Thermal Hydraulics Research - Young Professional Competition, and Thermal Hydraulics in Gen IV Reactors.

The Young Professional Competition is a special session jointly sponsored by the THD and the Young Members Group. This is a professional development session aimed to enhance the technical writing and presentation skills of young professionals working in thermal-hydraulics area. Accepted abstracts and presentations will be critiqued by a panel providing constructive feedback.



As indicated by the above chart, the THD’s level of participation and support at the national meetings has steadily increased the last few years. This trend clearly indicates the increasing interest in thermal-hydraulics and nuclear subjects, in general.

Organization of the meetings requires participation of many individuals. Foremost, members are encouraged to submit their work to the conferences for dissemination. We also need volunteers who can help with the review of the submitted summaries. Peer reviews are an essential part of scientific publication process and improve the quality of our conferences. Members who are interested in participating as reviewers are asked to contact the program committee chair K. Muftuoglu at [muftuoak @ westinghouse.com](mailto:muftuoak@westinghouse.com).

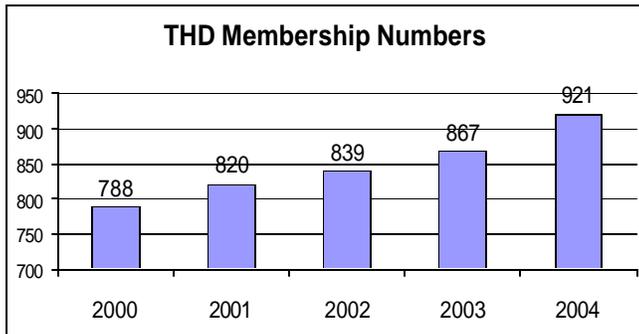
In summary, we have had a successful NURETH meeting and are already preparing for the next one in two years. National meetings are well attended, and THD has increasing support. These successes can be sustained only by strong participation of our members at every level.

Kurshad Muftuoglu

Program Committee Chair

Membership Committee Report

Our current membership stands at 921, based on EOY 2004. Historically, there are significant membership increases with major technical meetings such as NURETH and the ANS meetings; hence, we are expecting to see this number go even higher when ANS Headquarters provides our next report in the Spring. The chart below demonstrates our excellent growth trends.



At the June ANS meeting, the THD was asked to provide a presentation to the ANS Board of Directors. In preparing for that presentation, ANS provided some detailed information about our membership. In addition to the raw numbers of members, the following demographics were identified: 30% of our members are employed by a government agency, 20% are from industry, and 50% are from academia. Interesting enough is that the EC committee has similar representation, with 40% from both the government and academia group and 20% from industry.

Robert Martin for **Tom Larson**
Membership Committee Chair

Nominating Committee Report

The Nominating Committee is responsible for the nomination of THD members to leadership positions on both the Program and Executive Committees. The THD Nomination Committee has identified the following slate of candidates for the 2006-2007 Executive Committee:

Division Chair: Joy Rempe, Joy.Rempe@inl.gov
(assumes position as 2005-2006 Vice Chair/Chair Elect)
Vice Chair: Shripad Revankar, shripad@purdue.com
Secretary: Karen Vierow, Vierow@purdue.com
Treasurer: Chang Oh, Chang.Oh@inl.gov

Executive Committee Members (3-year term)

Hisashi Ninokata, hninokat@nr.titech.ac.jp
Fan Bill Cheung, fx4@psu.edu
Whee Choe, whee.choe@txu.com
Don Todd, Donald.Todd@framatome-anp.com
Yassin Hassan, y-hassan@tamu.edu

The THD would like to encourage members interested in getting more involved to contact one of the officers listed above. In particular, the division is always in need of volunteers as technical meeting session organizers and paper reviewers.

Yassin Hassin
Nominating Committee Chair

2005-2006 THD Officers:

Division Chair: Robert Martin, Robert.Martin@framatome-anp.com
Vice Chair: Joy Rempe, Joy.Rempe@inl.gov
Secretary: Chang Oh, Chang.Oh@inl.gov
Treasurer: Shripad Revankar, shripad@purdue.com

Executive Committee Members:

David Bessette (2006)
Martin Bertodano (2006)
Cetin Unal (2006)
Karen Vierow (2007)
Jong Kim (2008)

Committee Chairs:

Program Committee – Kurshad Muftuoglu
Honors and Awards Committee – Cetin Unal
Nominating Committee – Yassin Hassan
Membership Committee – Tom Larson

*Newsletter Edited by Chang Oh, 2005-6 THD Secretary,
Chang.Oh@inl.gov*