### **Executive Committee Meeting Minutes**

American Nuclear Society – Thermal Hydraulics Division Executive Committee Meeting Mariott Philadelphia Downtown Hotel, Philadelphia, PA, USA 4:30 – 6:00 PM, Sunday, June 17, 2018 Location: Rm # 305/306

### Attendees:

Igor Bolotnov, Lane Carasik (EC Member), Fan-Bill Cheung, Jinyong Feng, Bin Han, Yong Hoon Jeong, John Kelly (Board Liaison), Daniel Labrier, Mengnan Li, John Luxat (EC Member), Wade Marcum (Treasurer), Robert Martin, Elia Merzari (EC Member), Guillame Mignot, Kurshad Muftuoglu (Chair), Hisashi Ninokata (EC Member), W. David Pointer (Vice Chair), Dillon Shaver, Chul-Hwa Song (Secretary), Xiaodong Sun, Jun Wang, Bao-Wen Yang (EC Member), Matt Zimmer

### Proxies:

- A. Manera assigned to X. Sun
- X. Cheng assigned to W.D. Pointer
- P. Bardet assigned to W.D. Pointer

Sign-in sheets are included in Appendix-A.

1. Opening (Muftouglu)

Dr. K. Muftuoglu, 2017-2018 Thermal Hydraulics Division Chair, opened the Annual Meeting of the American Nuclear Society Thermal Hydraulics Division Executive Committee at 16:30 on Sunday, June 17, 2018. Quorum was established with 12 voting members, including 3 proxies, present.

2. Approval of Meeting Agenda (All)

The proposed agenda was distributed on-line before the meeting and on-site, as attached in <u>Appendix-B</u>, and reviewed by those in attendance. One additional item was proposed to include under item 14.d by Dr. E. Merzari.

Motions from the Program Committee:

i. Discussion on the Rule Changes

MOTION to Approve the Agenda MOTION Amended by Dr. E. Merzari SECONDED by Dr. W. Marcum APPROVED with Amendment without objection

3. Approval of Minutes from 2017 ANS Winter Meeting (All)

Draft meeting minutes for the THD Executive Committee Meeting at the 2017 ANS Winter Meeting were distributed on-line before the meeting, as attached in <u>Appendix-C</u>,

for review. Corrections and editorial changes were offered on-site by Prof. J. Luxat and Dr. E. Merzari that have not yet been implemented.

MOTION by Dr. Muftuoglu to Approve the Agenda MOTION Amended by Prof. W. Marcum SECONDED by Prof. J. Luxat APPROVED with Amendment without objection

### 4. Visitors from Student Conferences

Preparing for 2019 ANS Student Conference at Virginia Commonwealth University on April 4-6, 2019 has been briefly introduced by the TPC chair, Ms. Sarah Morgan (VCU), providing the Call for Papers to Dr. C.-H. Song. The flyer provided is included in <u>Appendix-D</u>.

It has been confirmed that the ANS-THD has traditionally been providing financial support of 500 USD to this event annually.

- Action Items from 2017 Winter Meeting
  - a. Request for Young Professionals Congress Support (Carasik/Merzari)

No additional action. Completed.

b. Scholarship Policy and Coordination Committee (Muftuoglu)

Dr. K. Muftuoglu reported that Award Scholarship Fund Committee has already been established, and contribution from NURETH-17 (\$31,180) makes substantial funds available.

There was a discussion on establishing two new scholarship programs, one for the late Prof. Hochreiter and the other for Vinny Esposito with \$25,000 donation to start fund by Esposito. Matching funds are needed from the THD division. There was a decision of starting the follow-up discussion on these two items.

MOTION by Dr. E. Merzari to begin the process to allocate \$40,000 from the THD unrestricted funds for a \$2000 yearly graduate scholarship MOTION Amended by Dr. L. Carasik to name scholarship the "Larry Hochreiter Scholarship" SECONDED by Dr. K. Muftuoglu APPROVED without objection

The scholarship for Esposito was started with an offer of a \$25,000 donation. Matching fund from the THD division is needed to establish this scholarship. Since it is uncertain whether this scholarship would be for graduate or undergraduate, it was necessary to ask the Family first what they wish. No preference, but an inclination from the family was shown toward an undergraduate scholarship.

MOTION by Dr. E. Merzari to allocate \$15,000 from the THD restricted funds to match the \$25,000 offered by Esposito family to establish \$2000 yearly Student

Scholarship.
SECONDED by Dr. K. Muftuoglu
APPROVED without objection

Completed.

- c. Re-start Service Award (Aumiller)
  - Dr. K. Muftuoglu confirmed that no report has been made yet and introduced that Dr. W.D. Pointer is volunteered to prepare this item for later discussion.

ACTION ITEM – Dr. W.D. Pointer prepares this item for later discussion.

- d. Update the THD website (Shaver)
  - Dr. D. Shaver reported that the THD website is being regularly updated.
- 6. Report from Professional Divisions Workshop (Muftuoglu)
  - Dr. K. Muftuoglu confirmed that Dr. W.D. Pointer and himself attended the Professional Divisions Workshop held in the morning of June 17, 2018.
- 7. Report from President's Meeting with Division Chairs (Muftuoglu)
  - Dr. J. Kelly, THD liaison to ANS H/Q and the incoming ANS President, expressed his appreciation to the THD working to align with the goals of ANS. He reiterated the need for ANS to offer value for students and professionals to drive participation. Be a voice for nuclear energy in the US and globally in terms of policy. He mentioned that the discussion of identifying limited topical meetings during a single year by ANS H/Q is one that is being worked out at present even though the policy as it stands will be on a first-come-first-serve basis.
- 8. Treasurer's Report (Marcum)

Prof. W. Marcum explained Treasurer's Report with the financial data to be reported in the 2018 Spring Newsletter. \$31,180 raised from NURETH-17 making it the most substantial amount raised from NURETH. (See the Treasurer's Report attached in <a href="https://example.com/appendix-E">Appendix-E</a>)

ACTION ITEM – Communicate the restricted fund budgeting with ANS H/Q.

- 9. Program Committee Report
  - a. 2018 ANS Annual Meeting Program in Philadelphia, PA (Merzari)
    - EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting
  - b. 2018 ANS Winter Meeting Program in Orlando, FL (Merzari)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

c. Planning for the Future 2019 Annual Meeting in Minneapolis, MN (Merzari/Bolotnov)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

d. Journal Special Issues: NURETH-17

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

e. ICAPP'18 Update (Sun/Bolotnov)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

f. ATH'18 Update (Merzari)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

g. NUTHOS-12 Update (Sun)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

h. NURETH-18 Update (Marcum)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting.

There was an announcement by Prof. Marcum on holding a preparatory meeting to be held on Tuesday evening at 07:00 pm in room 308.

i. NUTHOS-13 Update (Luxat)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

j. Motions from the PC Meeting (Merzari)

EC Members were reminded by Dr. E. Merzari that 3 motions were presented by the Program Committee, a standing committee, which do not require a second.

i. Approval of Program Committee Membership:

Outgoing PC Members: M. Avramova (NCSU), P. Ferroni (WEC), J. Lane (Zachary), Y.H. Jeong (KAIST), Donna Guillen (INL) and W. Marcum (OSU)

- Newcomers: Six (6) outgoing PC members were proposed to renominate along with four (4) newcomers who are J.Y. Feng (MIT), C. Brooks (UIUC), Jun Liao (WEC) and Ferry Roelofs (NRG)
- ii. New THD Representative to NPC (Prof. I. Bolotnov)
  - Prof. I. Bolotnov was proposed as new THD representative to NPC
- iii. Initiation of Conference Selection Committee's Activity for selecting the NURETH-19 host country.
  - The Conference Selection Committee is recommended to start its relevant activity by distributing the call-for-proposals to potential host countries.

MOTION by the EC Chair to approve APPROVED without any objection (for all three motions)

### 10. Membership Committee Report

S.Y. Lee

Dr. W.D. Pointer, on behalf of the Membership Committee, briefly reviewed the current membership status as reported in the 2018 Spring Newsletter of the division.

He explained that there shows a very small decrease (1251 to 1239) in the number of THD members in CY 2017, while a small decrease is also shown in the overall number of members in the ANS H/Q, resulting in rather an increase of THD portion in the number of all ANS members. Long-term trend is an increase in THD from about 900 since 2007. THD remains the fourth-largest division in ANS.

### 11. Division Website Report

Shaver

Dr. D. Shaver reported that two notices have been posted to the THD website: the announcement of the 2018 Young Professional Thermal Hydraulic Research Competition and the extension of the ATH paper submission deadline to June 30.

He mentioned that the website is being periodically updated even though there is still some outdated information.

Then it was discussed that the contact list is out of date and decided that it is redundant and that it should be removed altogether.

### 12. Honors and Awards Committee Report

Aumiller/Muftuoglu

- Dr. K. Muftuoglu explained the current status of the H&A Committee activity and the need of selecting the H&A Committee Chair. And he emphasized the need of changing the rule on selecting the chair and members of the H&A Committee in THD.
- Dr. E. Merzari, as PC Chair, explained in detail the relevant issues and proposed a change in the rule (R9.4), as below (see also Appendix-F):

### from:

- c. Officers
  - 1. On the fourth year of service to the Honors and Awards Committee, the past Division Chair shall serve as the Honors and Awards Committee Chair

to:

### c. Officers

- 1. One of the general members shall be appointed by the EC on the recommendation of the Nominating Committee to serve as the Honors and Awards Committee Chair for a 3 year term.
- 2. On the fourth year of service to the Honors and Awards Committee, the past Division Chair shall serve as the Honors and Awards Committee Vice-Chair for a 1 year term.
- 3. The Vice-Chair will fill in for the Chair as necessary and assist the Chair in conducting the duties of the office.

Prof. J. Luxat emphasized that it is important to select the TAA recipients on time as planned.

### 13. Nominating Committee Report

S.J. Kim

Dr. W.D. Pointer reminded the EC that motions from the Nominating Committee, as a standing committee, do not require a second. Dr. W.D. Pointer, on behalf of the Nominating Committee, presented the following results of the 2018 election slate:

Chair Dr. W. David Pointer Vice Chair Dr. Chul-Hwa Song Secretary Prof. Wade Marcum Dr. Elia Merzari

Executive Committee (5 at-Large): F.-B. Cheung, Y.H. Jeong, D. Shaver, X. Sun, and M. Matthew (NCSU)

Dr. K. Muftuoglu, on behalf of the Nominating Committee, thanked the following EC members whose terms will be expiring for their years of service:

Outgoing EC Members: P. Ferroni, D. Guillen, J. Kim, S.J. Kim

MOTION to approve the election slate as presented. APPROVED without objection

Dr. E. Merzari suggested Prof. H. Ninokata as new H&A Committee member at large and Prof. Ninokata showed his willingness of serving on the committee as member.

MOTION by Dr. Merzari to appoint Prof. H. Ninokata as the H&A member SECONDED by Dr. J. Luxat APPROVED without objection

### 14. New Business

a. Actions from Professional Divisions Workshop

Muftuoglu

No items to discuss

b. Actions from President's Meeting with Division Chairs

Muftuoglu

No items to discuss

c. Interactions with Other ANS Entities – Committees, etc.

Muftuoglu

No items to discuss

d. Discussion on the Rule Changes (Proposed by Dr. E. Merzari)

Muftuoglu

Dr. E. Merzari proposed to discuss about the change of the rule on selecting the chair and members of the H&A Committee by emphasizing the important role of this committee. He also pointed out that we have several urgent matters of selecting the recipients of 5 awards. He also proposed the chair term be for three years rather than one year.

Dr. K. Muftuoglu added some explanation of handling this item and opened the discussion.

Motion to change the rule from "on the fourth year of service on the H&A Committee, the past division chair shall serve as H&A Committee Chair" to Vice Chair.

MOTION to approve by Dr. W.D. Pointer SECONDED by Dr. E. Merzari APPROVED without objection

Dr. W.D. Pointer explained rather complicated current situation inside the H&A committee and proposed to select temporarily an Ad Hoc Chair of the H&A Committee with a mission of only selecting the 2017 and 2018 TAA recipients. And Prof. X. Sun was proposed for this role of Acting Chair.

MOTION by Dr. W.D. Pointer to Approve Prof. X. Sun as the Acting Chair on Selecting 2017 TAA Recipient SECONDED by Prof. J. Luxat APPROVED without objection

e. Other business Muftuoglu

No item suggested to discuss

Dr. W.D. Pointer, current Vice Chair and incoming Chair of the THD, delivered the Plaque of Appreciations to the outgoing THD chair, Dr. K. Muftuoglu, by recognizing his great efforts for the advancement of THD, and all the meeting participants thanked him for his multiple years' service.

Lastly, Prof. H. Ninokata introduced the ISReCTHA-2018, which will be held on August 29-31, 2018 in Lecco, Italy by distributing the call for participations (see the <u>Appendix-G</u>).

The Executive Committee meeting was adjourned at 6:27 pm.

### APPENDIX A

### **Executive Committee Meeting Sign-up Sheets**

June 17, 2018	Initial when present
Name Only those listed below are voting members of your division	finda when present
Kurshad Muftouglu, Chair	Wh.
David Pointer, Vice Chair	
Chul-Hwa Song, Secretary	attitony tow
Wade Marcum, Treasurer	WRU
Seungjin Kim, Immediate Past Chair	
John Kelly, Board Liaison	
Fatih Aydogan	
Philippe Bardet	
Lane Carasik	Sandonisale
Xu Cheng	orienajas
Yassin Hassan	
Jeffrey Lane	
Yang Liu	
John Luxat	8
Annalisa Manera	100 70
Elia Merzari	9/1
Nisashi Ninokata	1011.1.1
Piyush Sabharwall	1 anokala
Bao-Wen Yang	Barnery ang
Others, please PRINT in	(if there is not enough space, feel free to use the other side or sheet)
Dillon, Shaven	
A A A A	

- Dr.s W. D. Pointer and J. Kelly did not sign up on the Attendee Sheet above even though they attended the EC meeting.
  Prof.s A. Manera, X. Cheng and P. Bardet assigned their Proxy to Prof. X. Sun and Dr.
- Prof.s A. Manera, X. Cheng and P. Bardet assigned their Proxy to Prof. X. Sun and Dr. W.D. Pointer, as shown in page-1 of this document.

# Thermal Hydraulics Division Executive Committee Meeting Marriott Philadelphia Downtown Hotel Philadelphia, PA June 17, 2018



### Others, please PRINT in

Name	E-mail
Daniel Labrier	Sailaune migrat Doregonstate edu
Guillaume MIGNOT	sui l'aune mignet gorgonstate edy
Jun Wang	Jwang = 64 @ Wisc-edu jinyong + @ mit. Edu
Jingong Feng Xiaodong Suri	jinyong fe mit. Paru
	Xdsun Qumich. edy
Igor Bolotnov	iabolotn@ncsu.edu
Bin Han	hanbin 1991 Ostu. sjtu. edu. cu
Yong Hoon Jeong	jeongyh@kaist.ac.kr
Matt Zimmer	mdzimmer@ncsu.edu
Mengran G	mli 21@ hc sy. edu
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Article B10.2 - A quorum for the transaction of business at all Division (or TG) meetings shall consist of fifteen (15) qualified voters or twenty (20) percent of the qualified voters.

### **APPENDIX B**

## Executive Committee Meeting Agenda (Approved at the Meeting)

### PROPOSED AGENDA

American Nuclear Society – Thermal Hydraulics Division Executive Committee Meeting Mariott Philadelphia Downtown Hotel, Philadelphia, PA, USA 4:30 – 6:00 PM, Sunday, June 17, 2018 Location: Room # 305/306

1.	Opening	Muftuoglu
2.	Approval of Meeting Agenda	Muftuoglu
3.	Approval of Minutes from 2017 ANS Winter Meeting	Song/Muftuoglu
4.	Visitors from Student Conferences	
5.	Action Items from 2017 Winter Meeting a. Request for Young Professionals Congress Support b. Scholarship Policy and Coordination Committee c. Re-start Service Award d. Update the THD website	Carasik/Merzari Muftuoglu Aumiller Shaver
6.	Report from Professional Divisions Workshop	Muftuoglu
7.	Report from President's Meeting with Division Chairs	Muftuoglu
8.	Treasurer's Report	Marcum
10	Program Committee Report  a. 2018 ANS Annual Meeting Program in Philadelphia, PA b. 2018 ANS Winter Meeting Program in Orlando, FL c. Planning for the Future 2019 Annual Meeting in Minneapol d. Journal Special Issues: NURETH-17 e. ICAPP'18 Update f. ATH'18 Update g. NUTHOS-12 Update h. NURETH-18 Update i. NUTHOS-13 Update j. Motions from the PC Meeting  Membership Committee Report  Division Website Report	Merzari Merzari Iis, MN Merzari Yang/Merzari Sun/Bolotnov/Merzari Merzari Sun/Merzari Luxat Merzari Merzari S.Y. Lee
12	Honors and Awards Committee Report	Aumiller
13	Nominating Committee Report	S.J. Kim
14.	New Business All a. Actions from Professional Divisions Workshop	Muftuoglu

- b. Actions from President's Meeting with Division Chairsc. Interactions with Other ANS Entities Committees, etc.
- d. Rule changes (newly added)
  e. Other business

Muftuoglu Muftuoglu Merzari/Muftuoglu Muftuoglu

### APPENDIX C

### ANS 2017 Winter Executive Committee Meeting Minutes (Approved at the Meeting)

### **Executive Committee Meeting Minutes**

American Nuclear Society – Thermal Hydraulics Division Executive Committee Meeting Mariott Wardman Park, Washington, D.C., USA 4:30 – 6:00 PM, Sunday, October 29, 2017 Location: Maryland C

### Attendees:

Maria Avramova, Fatih Aydogan (EC Member), Igor Bolotnov, Lane Carasik (EC Member), Chih-Wei Chang, Fan-Bill Cheung, Paolo Ferroni, Yassin Hassan (EC Member), Lui HU, Jun Liao, Yang Liu (EC Member), Davis Liscowski, John Luxat (EC Member), John Kelly-(Board Liaison), Jong Kim, Annalisa Manera (EC member), Giovanni Maronati, Robert Martin, Elia Merzari (EC Member), Kurshad Muftuoglu (Chair), Hisashi Ninokata (EC Member), W. David Pointer (Vice Chair), Piyushi Sabharwall (EC Member), DuWayne Schubring, Chul-Hwa Song (Secretary), Xiaodong Sun, Sipeng Wang, Bao-Wen Yang (EC Member), Matt Zimmer

### Proxies:

Prof. S.J. Kim assigned to Dr. C.-H. Song

Scanned copy of the sign-in sheets is included in Appendix A.

### 1. Opening (Muftouglu)

Dr. K. Muftuoglu, 2017-2018 Thermal Hydraulics Division Chair opened the Winter Meeting of the American Nuclear Society Thermal Hydraulics Division Executive Committee at 16:31 on Sunday, October 29, 2017. Quorum was established with 15 voting members present.

Dr. K. Muftuoglu invited all the participants, including Non-EC members as well as first-attendees, to introduce themselves.

### 2. Approval of Meeting Agenda (All)

The proposed agenda was distributed and reviewed by those in attendance and no item was newly proposed.

MOTION by Dr. D. Pointer to approve the agenda SECONDED by Dr. Carasik APPROVED without objection

### 3. Remarks by Dr. John Kelly (Board Liaison)

Dr. Kelly, ANS President Elected and THD Liaison, briefly introduced the current status of ANS HQ in terms of finance and number of members pointing out the decreasing situation of HQ Revenue and members mainly due to the decrease of members from industry and the increase of retiring members.

Dr. Kelly also mentioned that DOE has been asked to review nuclear policies in a step toward revitalization of US nuclear industry. A need to rethink licensing basis (e.g., LB-LOCA) to account for extensive operating experience based on risk-informed approach has been proposed and this could be significant cost saver. It is needed to look for policies and regulations that can be put into more of a risk informed perspective and the ANS THD should be prepared to support this technical review.

4. Approval of Minutes from 2017 ANS Annual Meeting (All)

Draft meeting minutes for the THD Executive Committee Meeting at the 2017 ANS Annual Meeting were distributed by Dr. D. Pointer for review. Some minor corrections, including a correction (Prof. Merzari  $\rightarrow$  Dr. Merzari), were offered by Dr.s X. Sun and C.-H. Song, are to be implemented in the final version.

MOTION by Prof. J. Luxat SECONDED by Dr. P. Sabharwal APPROVED without objection

Visitors from Student Conferences

Preparing for Student Conference at the University of Florida has been briefly introduced by the TPC chair, Mr. Zander Mausolff, providing the Call for Papers to Dr. C.-H. Song. Details of this event are on the ANS website. It has been confirmed that the ANS-THD has traditionally been providing financial support of 500 USD to this event annually. The THD members are encouraged to join this event as reviewers and judges. The flyer provided is included in Appendix B(1).

- Action Items from 2017 Annual Meeting
  - a. Request for Young Professionals Congress Support (Merzaril)
    - Dr. Merzari reported that THD was represented at networking lunch
  - b. Populate ANS Collaborate (Pointer)
    - Dr. Pointer reported that the Collaborate site is active.
  - Scholarship Policy and Coordination Committee (Muftuoglu)
    - Dr. Muftuoglu reported that this item is still in progress and to be updated.
  - d. Establish Ad Hoc Finance Committee (Muftuoglu)
    - Dr. L. Carasik volunteered to join this committee as member together with the division Chair/Vice-Chair/Secretary.
  - e. Re-start Service Award (Aumiller)

ACTION ITEM - Dr. Muftuoglu will follow up with Dr. Aumiller.

f. Update the THD website (Shaver)

Dr. D. Shaver completed creation of the 'excellence in review' award page and also completed update of professional division.

ACTION ITEM – Dr. Pointer to send final meeting minutes to Dr. Shaver for posting

Report from Professional Divisions Workshop (Muftuoglu)

Dr. Muftuoglu reported that ANS Professional Divisions Committee has established a Bi-Annual Leadership Activity Roadmap. (See the roadmap in Appendix B(2)).

8. Report from President's Meeting with Division Chairs (Muftuoglu)

Dr. Muftuoglu reviewed the presentation given by ANS President, Bob Coward.

ACTION ITEM – Begin to think about how we can help to support the re-evaluation of nuclear policy for the future (Proposed by Dr. Kelly)

9. Treasurer's Report (Marcum)

Prof. W. Marcum explained Treasurer's Report with a budgetary proposal by teleconference. (See the Treasurer's Report in Appendix B(3))

ACTION ITEM – Prof. Marcum to propose THD budget by email

ACTION ITEM – Dr. Pointer will set up doodle poll for teleconference in the last week of November or first week of December

### Program Committee Report

a. 2017 ANS Winter Meeting Program in San Francisco, CA (Merzari)

Dr. Merzari referred the EC to the Program Committee Report since all were present for the Program Committee Meeting

b. 2018 ANS Annual Meeting Program in Philadelphia, PA (Merzari)

Dr. Merzari referred the EC to the Program Committee Report since all were present for the Program Committee Meeting

ATH 2018 Report (Merzari)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

d. NURETH-17 Report (B.W. Yang)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting.

The following statistics on the NURETH-17 were introduced by Prof. B.W. Yang who was the TPC Chair of the conference:

- 1020 abstracts submitted and 732 final papers were included in the proceedings (259 papers from China, 112 from U.S.)
- 686 presentations and 789 registered attendees from over 35 countries
- 939 participants additionally with 150 staff
- The following Awards provided during the Conference Banquet: 3 NURETH Fellows, 9 Best Papers, 5 Young Professionals, 10 Student Scholarship Awards, 3 Best Poster Award, 5 Best Reviewer Award
- e. NUTHOS-12 Report (Sun)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

NURETH-18 Report (Merzari)

EC Members were referred to the Program Committee Report since all were present for the Program Committee Meeting

g. Motions from the PC Meeting (Merzari)

Members of the EC were reminded by Dr. Merzari that motions presented by the Program Committee, as a standing committee, do not require a second.

i. Approval of Program Committee Membership

MOTION by PC chair (Dr. Merzari) to appoint Dr. Benhamadouche as PC member APPROVED without objection

11. Membership Committee Report

S.Y. Lee

No report

Division Website Report

Shaver

No additional updates

13. Honors and Awards Committee Report

Aumiller

Update has been provided by Dr. Muftuoglu, which include the followings:

- TAA: The committee has not finalized the selection of 2017 TAA, and will finalize and announce winner before the end of this year if decision can be reached.
- Best Paper Award: This award has not yet been finalized, and will be finalized before end of the year
- 14. Nominating Committee Report

S.J. Kim

The Nominating Committee will recommend Nominations to the EC.

### New Business

a. Actions from Professional Divisions Workshop

Muftuoglu

No actions

Actions from President's Meeting with Division Chairs

Muftuoglu

No actions

c. Interactions with Other ANS Entities - Committees, etc.

Muftuoglu

Dr. Muftuoglu reviewed the responsibilities of Division liaison.

 d. Interactions Discussion with Past ANS President (Prof. A. Klein) on the leadership of ANS-THD for Nuclear Grand Challenge (Accelerate Utilization of Simulation and Experimentation), Scheduled on 17:15.

Muftuoglu

This item has been addressed out of order to accommodate the schedule of Prof. A. Klein. Prof. Klein emphasized the leadership of ANS-THD for NGC (See the Request by Prof. Corradini in Appendix B(4))

Dr. Merzari suggested that we could leverage overlap between NURETH and M&C in Portland to address this challenge. It will not establish timeline and metrics, but rely on natural leadership and It is need to use all available resources inside and outside the society

e. Discussion on the Request to ANS HQ, THD and NISD by Prof. M. Corradini on Co-sponsoring an Initiative Preserving Key Nuclear Safety Data. (See the Request by Prof. Corradini in Appendix B(5))

Muftuoglu

Prof. F.B. Cheung explained this Initiative, and stressed that this may already be a relevant ANS position.

MOTION to endorse by Dr. L. Carasik SECONDED by Dr. E. Merzari APPROVED without objection

f. Student Member of the EC

Muftuoglu

ACTION ITEM - Prof. S.J. Kim will recommend that.

The Executive Committee meeting was adjourned at 6:05 pm

### APPENDIX A

### Executive Committee Meeting Sign-in Sheets

Thermal Hydraulics Division Executive Committee Meeting Marriott Wardman Park Hotel Washington DC October 29, 2017



Name	Initial at
Only those listed below are voting members of your division	Initial when present
Kurshad Muftouglu, Chair	0 28%
David Pointer, Vice Chair	10000
Chul-Hwa Song, Secretary	000
Wade Marcum, Treasurer	Child Have SONG Sa
Seungjin Kim, Immediate Past Chair	0
John Kelly, Board Liaison	Proxy to C. H. SHV & DO
Fatih Aydogan	J. Sitting
Philippe Bardet	AB .
Lane Carasik	
Xu Cheng	Sore Merricko
Yassin Hassan	.0.10
	XAA
Jeffrey Lane	
Yang Liu	Vadio
John Luxat	Drug ce
Annalisa Manera	doing
Elia Merzari	Slille -
Nisashi Ninokata	The Marchal
Piyush Sabharwall	but
Bao-Wen Yang	Hannen Law
Others, please PRINT in	(if there is not enough space, feel free to use the other side)
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Article B10.2 - A quorum for the transaction of business at all Division (or TG) meetings shall consist of fifteen (15) qualified voters or twenty (20) percent of the qualified voters.

### Thermal Hydraulies Division Executive Committee Meeting Marriott Wardman Park Hotel Washington DC October 29, 2017



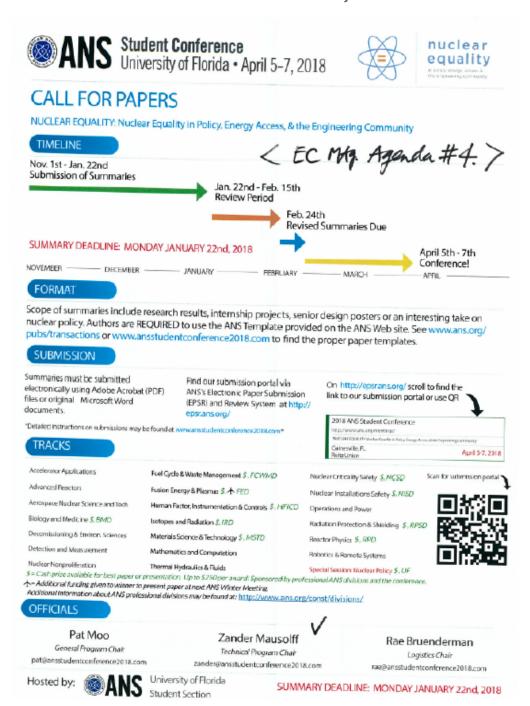
### Others, please PRINT in

Name	E-mail
Ouwagne Schubring	wangstoong@stu.xftu.edu.tn
OuWayne Schubring	dischubing@vtleedU
MARIA AVRAHOVA	mnavramo@ new.eou
Matt Zimmer	mdzimmer@ncsv.edu
JUN LIAO	GANJE westinghouse. com
Rui Hu	The Qanlgor
Robert March	plennous and a
Sobert Martin	remarting buxt. com
Xiaodong San	Xdsun@ amich.edu
Giovanni Maronati	gio, maronati Pemeil. com
Chih-Wei Chang	cchangil @ncsu.edu
	Daniel Bridger

Article B10.2 - A quorum for the transaction of business at all Division (or TG) meetings shall consist of fifteen (15) qualified voters or twenty (20) percent of the qualified voters.

### APPENDIX B(1)

### 2017 Student Conference Flyer



### APPENDIX B(2)

ANS Professional Divisions Committee's Bi-Annual Leadership Activity Roadmap

## American Nuclear Society Professional Divisions Bi-Annual Leadership Activity Roadmap

This roadmap lays out responsibilities by time period for the two-year cycle over which Divisions plan and execute activities in the nominal Vice-Chair/Chair cycle and in the support of sessions at the national meetings. This does not cover all activities in which a Division is expected to be engaged but is focused upon elections, finances, and national meetings for which timely interaction with ANS National is necessary. Additional resources can be found on the websites for the <u>Professional Divisions Committee</u>, <u>Meetings</u>, <u>Bylaws and Rules</u>, and <u>Planning Committees</u>. The <u>Professional Divisions Collaborate</u> page also includes presentations from the PD Workshops, other forms, and discussion threads on issues confronting divisions.

Specific documents to be used for planning and guidance Topical Meeting Manual and associated forms National Meeting Manual Professional Divisions Manual

Division Chair is responsible for assigning responsibilities for each task (if not otherwise specified in the Division Rules)

Elections and Planning

Financial

National Meetings\* (YIAM: Year 1 Annual Meeting, etc.)

<sup>\*</sup>Topical Meetings may not follow a set schedule in accordance with the fiscal or election year. Please consult the <u>Topical Meeting Manual</u> to view the activities and deadlines relative to the date of the Topical Meeting.

Month/Yr	Activity or Deadline
Jan 01	Send names of nominees for Society standing committees to ANS Vice-President/President elect (or to Val)  Deadline for summaries to YIAM. Recruit reviewers.
Feb V1	Submit preliminary set of Panel descriptions and list of panelists to HQ for Y1AM Complete reviews of summaries for Y1AM.  Vice Chair/Chair elect commences Annual Planning
Mar Y1	Compile Division Performance metrics and compare against annual/strategic goals Revised summaries due for Y1AM. Complete final reviews and disposition. Suggest topics for sessions/tracks/panels for the next WM to be put in the CFP
Apr Y1	Chair recruits and identifies fellow officers for the Professional Division Workshop (officer training)  Vice Chair/Chair Elect presents <u>Tactical (Annual) Plan</u> and Goals to EC for consideration and approval. Updates to the 5-Year Strategic Plan are proposed.  Submit final set of Panel descriptions and list of panelists to HQ for Y1AM Begin accepting summaries for Y1WM. Recruit reviewers.
May Y1	Chair distributes draft Executive Committee agenda/proposals to Officers (if EC is meeting

	in June) Prepare Division <u>Presentation</u> to the Board (if <u>scheduled</u> ) and submit to PDC Staff Liaison Deadline for summaries to Y1 WM. Reviews underway
Jun Y1	Y1AM - PD Workshop - EC meeting Y1AM - National Program Committee Submit updated Succession Plan and Annual Plans to HQ (into your Division folder) Submit preliminary set of Panel descriptions and list of panelists to HQ for Y1WM Treasurer Webinar/Training for newly elected treasurers
Jul Y1	Division Chair appoints the Division Nominating Committee Secretary finalizes EC Minutes and submits to HQ Budget Planning begins for upcoming year Complete reviews of summaries for Y1WM.
Aug Y1	Submit nominations for National ANS Officers and Board Members to the Society Nominating Committee Chair (Past President)  Division EC approves budget for upcoming year Revised summaries due for Y1WM. Complete final reviews and disposition.
Sep Y1	Division Nominating Committee proposes a slate of candidates for the Spring election Chair recruits and identifies attendees for the Professional Division Workshop (officer training)  Treasurer submits Final Division Budget for upcoming year to HQ
Oct Y1	Chair prepares Division <u>Presentation</u> to the Board (if <u>scheduled</u> ) and submit to PDC Staff Liaison Chair distributes draft Executive Committee agenda/proposals to Officers (if EC is meeting in November) Begin accepting summaries for Y2AM. Recruit reviewers. Suggest topics for sessions/tracks/panels for the next AM to be put in the CFP
Nov YI	Y1WM – PD Workshop – EC meeting Y1WM - National Program Committee Y1WM - Chair presents <u>Presentation</u> to the Board (if <u>scheduled</u> ) Division Treasurer submits a <u>proposed budget</u> for the following year to the ANS Accounting Manager Submit final slate of candidates to HQ for the Spring election
Dec Y1	Secretary finalizes EC Minutes and submits to HQ Send Final Disbursement requests to ANS Headquarters—Outreach Department to process before year-end.
Jan Y2	Send names of nominees for Society standing committees to ANS Vice-President/President- elect.  Deadline for summaries to Y2AM.
Feb Y2	Submit preliminary set of Panel descriptions and list of panelists to HQ for Y2AM  Complete reviews of summaries for Y2AM.  Vice Chair/Chair elect commences Annual Planning
Mar Y2	Compile Division Performance metrics and compare against annual/strategic goals Revised summaries due for Y2AM. Complete final reviews and disposition. Suggest topics for sessions/tracks/panels for the next WM to be put in the CFP
Apr Y2	Chair recruits and identifies fellow officers for the Professional Division Workshop (officer training)  Vice Chair/Chair Elect presents <u>Tactical (Annual) Plan</u> and Goals to EC for consideration and

	approval. Updates to the 5-Year Strategic Plan are proposed.  Submit final set of Panel descriptions and list of panelists to HQ for Y2AM  Begin accepting summaries for Y2WM. Recruit reviewers.
May Y2	Chair distributes draft Executive Committee agenda/proposals to Officers (if EC is meeting in June)  Prepare Division Presentation to the Board (if scheduled) and submit to PDC Staff Liaison Deadline for summaries to Y2WM. Reviews underway
Jun Y2	Y2AM – PD Workshop – EC meeting Y2AM – National Program Committee Submit updated Succession Plan and Annual Plans to HQ (into your Division folder) Submit preliminary set of Panel descriptions and list of panelists to HQ for Y2WM Treasurer Webinar/Training
Jul Y2	Division Chair appoints the Division Nominating Committee Secretary finalizes EC Minutes and submits to HQ Budget Planning begins for upcoming year Complete reviews of summaries for Y2WM.
Aug Y2	Submit nominations for National ANS Officers and Board Members to the Society Nominating Committee Chair (Past President)  Division EC approves budget for upcoming year Revised summaries due for Y2WM. Complete final reviews and disposition.
Sep Y2	Division Nominating Committee proposes a slate of candidates for the Spring election Chair recruits and identifies attendees for the Professional Division Workshop (officer training) Treasurer submits Final Division Budget for upcoming year to HQ
Oct Y2	Chair prepares Division Presentation to the Board (if scheduled) and submit to PDC Staff Liaison  Chair distributes draft Executive Committee agenda/proposals to Officers (if EC is meeting in November)  Suggest topics for sessions/tracks/panels for the next AM to be put in the CFP
Nov Y2	Y2WM - PD Workshop - EC meeting Y2WM - National Program Committee Y2WM - Chair presents <u>Presentation</u> to the Board (if <u>scheduled</u> ) Division Treasurer submits a <u>proposed budget</u> for the following year to the ANS Accounting Manager Submit final slate of candidates to HQ for the Spring election
Dec Y2	Secretary finalizes EC Minutes and submits to HQ Send Final Disbursement requests to ANS Headquarters –Outreach Department to process before year-end.

### APPENDIX B(3)

### 2017 THD Treasurer's Report (Proposed)

The following financial report for the Thermal Hydraulics Divisions reflects the state of our divisions account as of September 30, 2017. The present actual balance of the THDs account is \$58,890.75. This is a \$5,737.31 net positive variance when compared to the division's budget. Additional revenue and fewer expenditures than anticipated have resulted in this outcome. Revenue contributions have included \$150 through Dues Allocations beyond that anticipated as well as a \$5000 donation from the NUTHOS-11 meeting (less \$20 resulting from processing charges through ANS HQ). At present the Division's expenditures have been fewer as well including a single expenditures for awards dissemination at the ANS Annual meeting of \$134.75. Student conference support includes the distribution of \$500 to the student conference and a total of 10 scholarship at \$100 each for student travel support to ANS conferences (summing to \$1500 in Student Support). Two additional expenditures were accrued which were not projected within the budget, including a single postage charge of \$7.87 and printing charge of \$0.07 (totaling \$7.94 in Other Expenses). The current status of the budget is healthy with positive net increases in funding balance over the past three consecutive years.

	Actual	Budget	_
	9/30/2017	9/30/2017	Variance
Revenues			
Dues Revenue Allocation	\$ 1,875.00	\$ 1,725.00	\$ 150.00
Contribution Revenue	\$ 4,980.00	\$ -	\$ 4,980.00
Total Revenue	\$ 6,855.00	\$ 1,725.00	\$ 5,130.00
Expenditures			
Awards, Plaques	\$ 134.75	\$ 750.00	\$ (615.25)
Student Support	\$ 1,500.00	\$ 1,500.00	\$ -
Other Expenses	\$ 7.94	\$ -	\$ 7.94
Total Expenditures	\$ 1,642.69	\$ 2,250.00	\$ (607.31)
Net Surplus / (Deficit)	\$ 5,212.31	\$ (525.00)	\$ 5,737.31
Fund Balance at 1/1/2017	\$53,678.44	\$53,678.44	\$ -
Fund Balance at 9/30/2017	\$58,890.75	\$53,153.44	\$ 5,737.31

### APPENDIX B(4)

Prof. Klein's Request on the Leadership of ANS-THD for Nuclear Grand Challenge



### GOING FORWARD

- Encourage members, divisions, and leadership to promote and discuss the Challenges with public policymakers, government officials, community leaders, industry, others
- Encourage divisions to hold focused topical meetings, technical, and plenary sessions to determine paths forward
- Encourage technical journal papers, books, webinars, social media, ANS Collaborate discussions, position statements, curriculum development, Nuclear News and Radwaste Solutions articles, letters to the editor

OANS

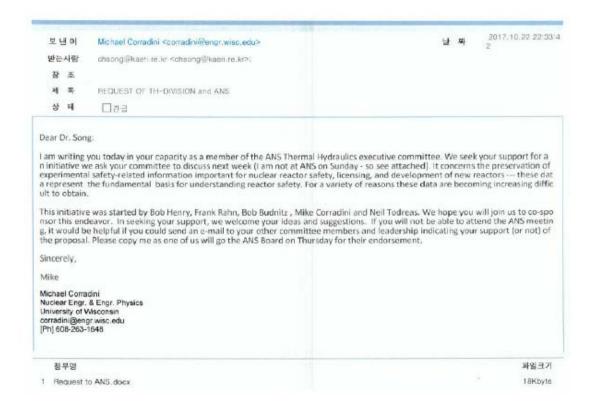
ANS NUCLEAR GRAND CHALLENGES		Engagir <b>N</b> G		
Grand Challenge	Suggested Lead Division(s)	Suggested Cooperating Divisions	Suggested Cooperating Committees	Applicable Policy Statements
Transform the way the nuclear technologies sector thinks about public engagement	OPD	NCSD, BMD, IRD, ETWDD, RPSD	Communications, Government Relations, PWANS	24, 26, 63, 77, 79, 83
Establish the scientific basis for modern low-dose radiation regulation	RPSD & BMD	IRD, OPD, YMG, NISD	Communications, Government Relations, Public Policy, International	28, 41, 74
Close the nuclear fuel cycle	FCWMD	DESD, AAD, MSTD, OPD, RPD	Communications	11, 22, 45, 47, 74, 76, 78

ANS NUCLEAR GRAND CHALLENGES		Engagin NG		
Grand Challenge	Suggested Lead Division(s)	Suggested Cooperating Divisions	Suggested Cooperating Committees	Applicable Policy Statements
Ensure continuous availability of radioisotopes	IRD	BMD, YMG, AAD, FCWMD, NNPD	Government Relations, Public Policy	18, 28, 30, 72
Rejuvenate ruclear technology infrastructure and facilities	DESD & NCSD	NISD, RRSD, HFICD		13, 26, 53
Accelerate development and qualification of advanced materials	MSTD	FED, ANSTD, MCD		12, 25, 40

ANS NUCLEAR GRAND CHALLENGES		Engagir NG		
Grand Challenge	Suggested Lead Division(s)	Suggested Cooperating Divisions	Suggested Cooperating Committees	Applicable Policy Statements
Accelerate utilization of simulation and experimentation	MCD & THD	RPD, FED, RRSD		12, 25, 40, 48, 51
Expedite licensing and deployment of advanced reactor designs	NISD	YMG, THD, ANST, HFICD, NNPD	Government Relations, Public Policy	24, 25, 46, 77, 80
Expedite nuclear education updates and knowledge transfer	ETWDD	YMG, OPD	APPC, SPCC, NEED	21, 29, 48, 61, 66

### APPENDIX B(5)

### Request to ANS HQ, THD and NISD by Prof. M. Corradini et al. on Co-sponsoring an Initiative Preserving Key Nuclear Safety Data



### Request to ANS Exec Committee, and the Thermal Hydraulics and Nuclear Installation Safety Divisions, to Sponsor an Initiative

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Over the years, much important experimental data relevant to nuclear power plant safety has become difficult or impossible to obtain. These data are an important part of the technical basis for our understanding of nuclear reactor safety. Its loss may eventually call into question the design and licensing of reactors because the physical basis of computer codes and engineering analysis can no longer be assured. This paper requests the ANS and its related Divisions to sanction an activity to collect and preserve key safety data. This is not a request for funding, but simply a request to endorse such an activity as critically important to a sustained nuclear future.

### Background←

Much safety information is being lost these days, because there is no coordinated effort being taken to preserve it. Often it is simply discarded by people that have no background regarding the importance of the information. Some limited data for important experiments such as LOFT, Marviken, CST, CVTR, etc. can be found on the internet. However most of the actual source data are hard to find or lost completely. Often the organization originally sponsoring the experiment is no longer in operation. Furthermore, the research facilities may have been decommissioned and the researchers who performed the experiments may be no longer working. Hence, critical experimental details that resided in their memories are lost.

### Objective<sup>↓</sup>

The objective is to ensure critical data are preserved and easy to obtain. The ultimate goal would be an overarching organization that could preserve safety related information from old experiments, including notebooks and observations from retiring engineers and scientists. Equally important would be to archive information from current safety research projects as they are concluded. This could relieve the organization performing the experiments from a custodial role.

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The ultimate goal is to assemble all experimental information important to licensing and safety in a repository that is in the public domain. These experiments include thermal /hydraulic, hydrogen, aerosols, criticality benchmarks, MCCI, fission products just to name a few. The repository could preserve journal and conference papers from decades ago that discuss early safety experiments or which present somewhat different technical approaches or interpretations of the data. Data from critics should be included as long as they are published, rigorous and well vetted through the usual technical review process.

Data preservation could be an important educational component if the project had students working in an organized manner with older experts who could provide guidance on what important data to capture and develop simple ways to do it. That suggests working with one or more universities to establish a data center. Having students and post-docs on the project

would have the further benefit of training a cadre of people who understand what information is

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Unresolved for the time being are copyright and licensing issues. Also unresolved is exactly how the data would be preserved. This would be an initial task for the data center.

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The issue of financial support is also not addressed at this point, but ANS endorsement would add weight to a discussion with potentially interested parties. Other organizations such as NRC, DOE, EPRI, vendors, international laboratories and others might choose to be cosponsors.

### Further Insights↓

Three examples of data loss come to mind, pointing out the urgency of the initiative. The LOFT data was recorded on wide magnetic tape. The last machine that could read the tapes cost too much to maintain so the access to the source data was lost. Second example: when HDR was decommissioned, the experimental data for the tests that were performed were cataloged, boxed-up and sent to Karlsruhe for safe keeping. When it arrived at the KfK, it was promptly lost and never found. Last example: most of the Marviken experiments were performed through OECD. One Marviken containment test was an international standard problem, but when OECD (Paris) was asked for a copy of the test report they could not find it in their files. Luckily, one of the young engineers at Marviken at the time of the experiments had a copy of the report in his garage. That was the only copy that could be found in Sweden. Numerous other examples exist.

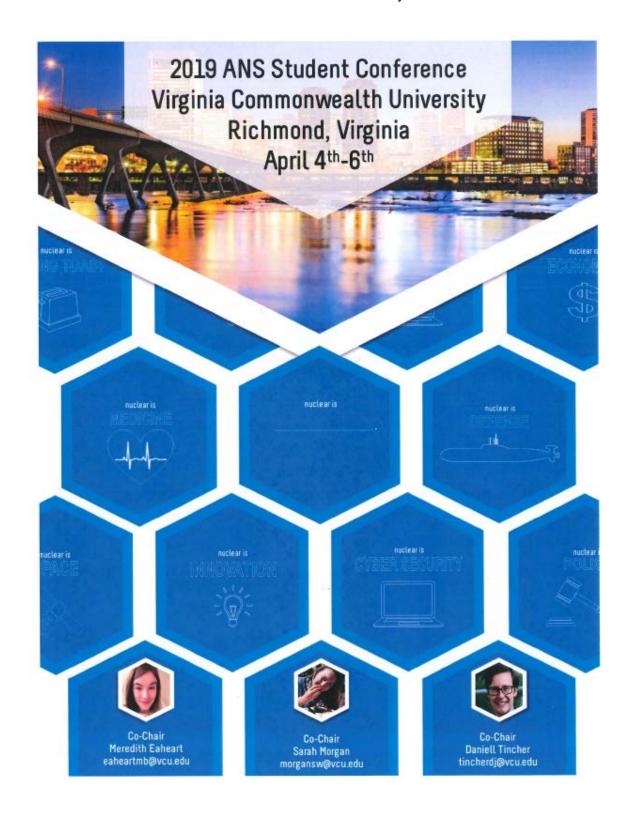
### What we are requesting€

We are requesting an endorsement of the interested ANS divisions and in particular the Nuclear Installations Safety Division and the Thermal Hydraulics Division. With the support of these divisions, we are also seeking the endorsement of this initiative by the ANS Board of Directors. To further advance the project we also request that the ANS Executive committee establish an Ad Hoc committee to develop a plan for future actions/responsibilities, and a set of sequential implementation steps. The ad hoc committee would also be charged with producing recommendations concerning the technology to collect and secure the data along with an organizational structure for the data repository.

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### APPENDIX D

### 2019 Student Conference Flyer



### APPENDIX E

### THD Treasurer's Report

### AMERICAN NUCLEAR SOCIETY Thermal Hydraulics Division 3/31/2018

	Actual 3/31/2018	Budget 12/31/2018	Variance
Revenues			
Dues Revenue Allocation: MEMBERSHIP DUES ALLOCATION	570	2,300	(1,730)
Total Dues Revenue Allocation	570	2,300	(1,730)
Meeting Revenue:		7,252	(7,252)
Total Meeting Revenue Total Revenue	570	7,252 9,552	(7,252) (8,982)
Expenditures			
Awards, Plaques: 14-8015-000000-063140 Div, Awards/Plaques - THD		1,250	(1,250)
Total Awards, Plaques		1,250	(1,250)
Student Support: 14-8030-000000-063140 Div-Student Support-THD		3,000	(3,000)
Total Student Support		3,000	(3,000)
Scholarship & NEED Funding: 14-8035-000000-063140 Division - Scholarship & NEED Funding - T	HD	500	(500)
Total Scholarship & NEED Funding Total Expenditures		500 <b>4,750</b>	(500) <b>(4,750)</b>
Net Surplus/(Deficit)	570	4,802	(4,232)

FUNDS RECEIVED FROM NURETH-17 (\$31,180 ON 4/16/18) WILL BE REFLECTED ON 6/30/18 STATEMENT.

### AMERICAN NUCLEAR SOCIETY Thermal Hydraulics Division 3/31/2018

	Actual	Budget	
_	3/31/2018	12/31/2018	Variance
Revenues Dues Revenue Allocation Meeting Revenue Total Revenue	\$570 <b>570</b>	\$2,300 7,252 <b>9,552</b>	(\$1,730) (7,252) ( <b>8,982)</b>
Expenditures Awards, Plaques Student Support Scholarship & NEED Funding Total Expenditures		1,250 3,000 500 <b>4,750</b>	(1,250) (3,000) (500) ( <b>4,750)</b>
Net Surplus/(Deficit)	570	4,802	(4,232)
Fund Balance at 1/1/18	59,018	59,018	-
Fund Balance at 3/31/18	59,588	63,820	(4,232)

FUNDS RECEIVED FROM NURETH-17 (\$31,180 ON 4/16/18) WILL BE REFLECTED ON 6/30/18 STATEMENT.

### APPENDIX F

### Proposal on the Change of the Rule (R9.4)

### Proposed rule change to modify H&A leadership

This year (2017-2018) we have not awarded the TAA. This is the second time it happens in 5 years. We are effectively asking potential division officers to commit to nine (9) years from treasurer to H&A chair. Even worse between immediate past chair and H&A chair there are several light-load years. It is not surprising that often H&A members become less active in this period. It has happened already twice in recent years, and we have not awarded the TAA in those years.

The H&A chair duties are very important. They represent a core-function of THD. They are also heavy in work-load. And it takes time to ease into office and one year is short: that leads to delays and ineffective promotion of our awards and our members. One of the reasons our program has been successful compared to other divisions is the steady multi-year leadership. I suggest we adopt a similar model for the H&A chair: a three year term. I think our award program is too important to subject it to year-to-year variability.

Proposed Rule change (R9.4). From:

(by timerrani)

c. Officers

 On the fourth year of service to the Honors and Awards Committee, the past Division Chair shall serve as the Honors and Awards Committee Chair

### To:

- c. Officers
- One of the general members shall be appointed by the EC on the recommendation of the nominating committee to serve as the Honors and Awards Committee Chair for a 3 year term.
- On the fourth year of service to the Honors and Awards Committee, the past Division Chair shall serve as the Honors and Awards Committee Vice-Chair for a 1 year term.
- The Vice-Chair will fill-in for the Chair as necessary and assist the Chair in conducting the duties of the office.

### APPENDIX G

### ISReCTHA-2018 Seminar Flyer









### ISReCTHA 2018

International Seminar on Nuclear Reactor Core
Thermal Hydraulics Analysis
August 29-31, 2018, Lecco, Italy

ISReCTHA: International Seminar on Nuclear Reactor Core Thermal Hydraulics Analysis (1) Outline

- Continuation of International Seminar on Subchannel Analysis (ISSCA 1992~1997) and International Seminar on Subchannel Analysis, CFD and CHF (ISACC 2013 ~ 2015); and is held
- On the POLIMI Lecco Campus, Lecco, Italy, Aug 29-31, 2018;
- As an international seminar to conform a forum on the nuclear reactor core and fuel assembly thermal hydraulics analysis
  - including subchannel analysis, CFD and experimental investigations
  - of PWRs, BWRs, LMRs (Na, Pb,Pb/Bi, ..), GCRs (Prismatic/pebble bed/..), Molten Salt Rx, .. , etc.;

### consisting of

- ~ 20 lecturers from industry, research laboratories and academia;
- ~ 30 technical paper presentations;
- On the topics connected to the nuclear reactor core and fuel assembly thermal hydraulics and related safety.
- Young professionals and students are welcome!
- Visit <a href="https://www.eko.polimi.it/index.php/rectha/rectha/">https://www.eko.polimi.it/index.php/rectha/rectha/</a>

Dipartimento di Energia



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