

**ASME Subcommittee on Properties of Water and Steam**  
**Fall meeting, October 19-20, 2003**

**Location: Parkview West Room, Omni William Penn Hotel, Pittsburgh, PA**

**Time: Sunday 2:30-5:30 PM, Monday 8:30 AM – Noon**

**Attendees**

Richard Jacobson, Johanna Levelt Sengers, Jan Sengers, Serguei Lvov, Allan Harvey, Dan Friend, John Gallagher, James Bellows, William Parry

Agenda and minutes approved.

**Steam Tables book and Software**

as of 4/30/03

- 460 professional software, 31 student software
- Last 12 months: 125 books, 21 professional software, 2 student

Issue of a site license policy statement should be brought up to Michael Tinkleman. We are not interested in spending a lot of effort on it.

Issue of royalties needs to be pursued.

Ideas include:

Reinstitute royalties

ASME should

- Recover cost of preparation of product
- Adder for development of future product—negotiated with committee (10% of purchase price as a default)

Committee endorses royalties.

We will need to consider revising book when new transport properties come out. *Agenda item for fall 2004.*

There is a need to bring the metastable region back to IAPWS. People are starting to question the current formulation. Bill Parry will document the problem to us and IRS and we support investigation of the issue.

Rich Jacobson has uncovered an issue on the dissociation of water to hydrogen and oxygen. He will get a better definition of the issue and take it to TPWS.

Software is now version 1.1 with corrections. Corrections can be downloaded from website.

Zero requests for technical support to John Gallagher, implying no new known bugs.

Still interested in version capable of use with EXCEL. It would require a .dll and add-ins. What would competitors to EXCEL require? GE is working on dll and add-ins. The subcommittee would be interested in marketing this product. Allan will check with Phil DiVietro before Bill Parry pushes hard. We would be willing to market properly tested equivalents for EXCEL competitors.

We need a user friendly interface to the steam tables.

Inclusion of new backward equations. No plan, but hope that GE can do this for us. *Revisit in Spring 2004.*

Testing: We need a formal test set. Bill will try to collect the test set that was used for the current code. Allan and Dan will investigate the possibility that students at the University of Colorado might be interested.

### **Calculation of Water Dissociation Constant**

There will be no new experimental data in the near future. Currently have about 300 data. Marshall and Franck equation does not fit low density data well. Lvov has equation that fits all data within experimental error and a program to calculate the values. The committee encourages Serguei complete the work of the task group on  $K_w$  by developing a draft guideline to replace the current release and sending it to the TPWS and PCAS chairs before in the next few months.

### **New directions**

Potential new initiatives within the committee (Perspective: What are the needs of industry in the next 20 years (fuel cells, hydrogen electrical economy, etc.))

- Strengthening chemistry component of committee
- Task group to look at new directions
- More details in May

### **Custodial fund**

Purpose of custodial fund: IAPWS dues and expenses, IAPWS meetings, miscellaneous expenses. Significant source of money is EPRI for the purposes of the committee.

Ideas:

- 5 years of IAPWS dues (8000 SFR) + 5 years of expenses (\$2K/year) =  $\sim 6K \times 5 \text{ years} = \$30K$ .
- Creation and update of software for steam properties (e.g. adding backward equations)
- Other new initiatives (see above)

Costs expected to increase.

### **IAPWS**

Issues

- PCC problems in US
  - Len Olavessen will chair a task group, JCB participates, to get PPEC input. He will prepare a draft list and circulate within PPEC and get their general concurrence (Report in spring meeting). This is expected to be a continuing process.

- Report on IAPWS restructuring

### **IAPWS Representative**

- Anneke Sengers resigns as IAPWS representative as of January 1, 2004.
- Dan Friend will be new IAPWS representative as of January 1, 2004.

### **IAPWS Statutes**

- Fellows criteria and procedure

### **Proposal for IAPWS Fellow**

It was unanimously agreed to nominate Mr. Miyagawa from Japan—Anneke will do this.

Members are reminded that Helmholtz Award nominations are due January 31, 2004.

Anneke Levelt Sengers reported further on the 2003 IAPWS meeting. Those interested further can see the minutes under the “Meetings” section of [www.iapws.org](http://www.iapws.org).

### **Kyoto Planning**

Dan Friend will contact Kenji Yasuoka about reactivating the simulation task group while at the conference planning meeting in January in Japan. He should send Yasuoka a membership list of the task group.

ICPWS task group (Dan Friend and James Bellows) will investigate the need for funding up to \$3000 for selected US participants to enhance the US representation at the meeting. They are authorized to commit that amount of money on behalf of the subcommittee—Approved. [This would be in response to letters requesting financial support and for encouragement of selected graduate student coauthors. Best plan is to pay selected registration fees through the Japanese committee.]

Jan Sengers will tell Jefferson Tester at MIT that his registration fee will be waived.—Approved [Part of the \$3000].

NIST Scientific formulation report from Allan Harvey: will produce a new Version 2.21 in the next few months to incorporate minor fix in IAPWS viscosity release and fix 2 or 3 minor bugs. In the past year, 48 sales of NIST implementation (19 with source code) and 1 license.

Transport properties report by Dan Friend. Viscosity formulation is to be drafted for first presentation to Working Group in Kyoto. Work on a replacement Thermal Conductivity release will lag behind by a year or two.

### **Membership**

Every US participant in the ICPWS will be invited to the May meeting – Dan Friend will see about getting this list from the organizing committee. Larry French of GE no longer working in area, withdrawn from membership.

Chair will ask Len Olavessen to get the PPEC spring 2005 meeting place before our April 28-29, 2004 Meeting

Adjourned

**Preliminary Agenda**  
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- 1) Approval of Agenda**
- 2) Approval of Minutes**
- 3) ASME Steam Tables book**
  - 3a) Report on sales Allan Harvey
  - 3b) Errata Allan Harvey
  - 3c) Future plans All
- 4) ASME Software for IAPWS-IF97**
  - 4a) Report on sales and new Version Allan Harvey
  - 4b) Technical support John Gallagher
  - 4c) Known bugs and problems John Gallagher, Allan Harvey
  - 4d) Plans for new backward equations Allan Harvey, Bill Parry
  - 4e) Testing of future versions Bellows, Harvey, Parry
- 5) Calculation of Water Dissociation Constant** Serguei Lvov
- 6) IAPWS issues**
  - 6a) Report on 2003 IAPWS meeting Anneke Sengers
  - 6b) Discussion of changes in IAPWS All
  - 6c) IAPWS Awards Anneke Sengers
  - 6d) Update on IAPWS Monograph Allan Harvey, Don Palmer
  - 6e) 14th ICPWS in Kyoto, Japan
  - 6f) Scholarships for ICPWS attendees?
- 7) U.S. Subcommittee and IAPWS Web pages** Allan Harvey
- 8) Update on implementation of general/scientific formulation** Allan Harvey
- 9) Report on transport properties** Dan Friend
- 10) Membership**
- 11) New Business**
- 12) Next Meeting – Time, Place, etc.**
- 13) Adjournment**