

**Minutes: Properties Subcommittee,
ASME Research & Technology Committee on Water and Steam in Thermal Systems
Orlando, FL, October 25-26, 2007**

Attendance:

Jim Bellows, Siemens Power Generation (Chair)
Dan Friend, NIST (U.S. IAPWS Delegate)
John Gallagher, NIST
Allan Harvey, NIST (Secretary)
Rich Harwood, Siemens Power Generation
Peter Murphy, General Electric
Bill Parry, General Electric

[NOTE: Items numbered as on Preliminary Agenda, which is attached. Numbering reflects order on agenda, not order in which items were actually discussed.]

1 & 2. Approval of Agenda and Review of Action Items from Previous Minutes

A preliminary agenda (attached) was distributed and approved with the provision that the order of considering items would be changed. Minutes of the Spring 2007 meeting had been approved by email. Action items were reviewed. Leftover **Action** items carried over are as follows. [Bellows to circulate IAPWS PCC minutes to ASME's PPEC committee and Water Technology subcommittee. Bellows to write cover letters to go with gifts of IAPWS monograph to GE and Siemens sponsors. Harvey and Parry to look at tightening software convergence tolerances on H and S for next version.]

3. ASME Steam Tables Book

Allan Harvey reported that total sales as of 10/10/07 are 1183, reflecting 122 books sold in the last 12 months. No new Errata have been found. Annual sales have been "flat" for several years.

Sales of the Compact Edition have been 2287 in a little less than one year. The majority of these have been bulk orders. This booklet is now listed as a resource on the portion of the ASME website concerned with preparation for the Professional Engineering exam.

Plans were discussed for preparing a Second Edition with the new Region 5 and viscosity formulations. The plan is to have everything ready to go by the time of the IAPWS meeting in September 2008, so that printing can begin immediately when the viscosity release is approved.

[**Actions:** Harvey to produce new tables and text, coordinate with ASME Press, check with ASME Press about pricing (with royalty), a cover that distinguishes the new edition, etc. Gallagher to produce new charts. Harvey to send new viscosity routine to Gallagher and find out what format ASME Press wants for charts. Harvey and Bellows to produce Foreword for 2nd Edition.]

There was extensive discussion of the proposal to adopt the comprehensive book produced by Profs. Wagner and Kretschmar (and published by Springer) as the "ASME" steam tables. It was finally decided to decline the offer and continue with our own book.

[**Action:** Bellows (with input from Harvey) to inform Wagner and Kretschmar of decision.]

4. ASME Software for IAPWS-IF97

Total sales are 539 "Professional" version, reflecting 18 Professional in the past 12 months, a nearly constant rate over the past few years.

No new bugs had been reported in Version 1.1, but one user had reported apparently spurious warnings for some calculations around 28 MPa and 680 K.

[**Actions:** Gallagher to provide Parry with details, Parry to investigate.]

Bill Parry reported that there had been little progress on the DLL and Excel add-in for steam properties, but that a form of it was being widely used within GE. Some plans for moving forward were adopted. It was decided that this should be a separate product for ASME, with pricing (potentially including royalties) and title to be worked out. If we hit a major obstacle with this version, we can look at outsourcing the project.

[**Actions:** Parry and Harwood attempt to get working on Harwood's laptop. Parry to consult an expert to get installation straightened out, and check performance on Vista. All test as much as possible once an installable version is received. Bellows to get student help in testing starting in January.]

5. Web sites

There was nothing new to report on this item, other than the addition of some password-protected space linked to the IAPWS website where Working Group documents could be placed.

6. U.S. Implementation of New Formulation for General and Scientific Use

Allan Harvey reported that sales of Version 2.2 in Fiscal 2007 had been 42 (19 with source code), with sales roughly constant for several years. A minor update for a new IAPWS viscosity standard (and possibly new melting and sublimation lines) will be needed in 2008. Eventually (perhaps dictated by the spread of 64-bit machines, where the current product probably will not work) the executable product will be switched to a new platform to match related NIST databases.

7. Transport Properties

Dan Friend reported that the new IAPWS formulation for the viscosity was in its final editorial review prior to being sent out to postal ballot for official adoption in 2008. Work has started on the thermal conductivity. IAPWS has adopted slightly revised formulations for transport properties of D₂O at its 2007 meeting.

8. IAPWS Issues

Possible nominations for IAPWS Fellow were discussed, and a candidate was decided upon [**Action:** Friend and Bellows to work on preparing nomination.] Members were encouraged to think about qualified nominees for the Helmholtz award.

[**Action:** Bellows to send reminders to some people.]

Dan Friend reported on various aspects of the 2007 IAPWS meeting in Lucerne.

There is one proposed ICRNs from IAPWS (on seawater) to be commented upon; we must respond with our approval or suggestions for changes by January 31. There was also discussion of how to better publicize these documents.

[**Actions:** Harvey to remind people of seawater document when sending out minutes. Friend to communicate any official U.S. response to the IAPWS Executive Secretary before January 31. Harvey to write up a brief article (a couple of paragraphs) on ICRNs. Harvey to see about getting it into *Mechanical Engineering* and *Chemical Engineering Progress*; Bellows to see about getting it into *Chemical & Engineering News*.]

The upcoming September 2008 ICPWS in Berlin (www.icpws15.de) was discussed.

[**Action:** Friend to publicize at AIChE, Harwood to look into publicizing at PowerGen.]

9. Membership and Officers

There were no changes in membership (some addresses were updated). Jim Bellows expressed the desire to step down as Chair following our April 2008 meeting; this will be an Agenda item then.

10. Old Business

The committee worked out language for letters to be sent with IAPWS monographs.

[**Actions:** Bellows to present to appropriate person at Siemens. Parry to present to appropriate person at GE.]

There was extensive discussion of the ongoing issues of royalties from ASME for our products, where we had been left out of the latest decisions (which were limited to technical journals). A letter to the Chair of the Board on Research & Technology Development was suggested; some time was spent discussing the contents and tone.

[**Actions:** Harvey to prepare draft of letter, to be sent (prior to the Nov. 12 BRTD meeting) in his role as Chair of WSTS Committee. Parry and Bellows to review.]

Questions arose as to the status of our funding and reports with EPRI.

[**Action:** Bellows to investigate status and send reports/requests if needed.]

11. New Business

Nothing on this item.

12. Next Meetings

In Spring 2008, we will meet at NIST-Gaithersburg on Wednesday and Thursday (just the morning on Thursday), April 16-17. We will work on the possibility of holding the Fall 2008 meeting at Alstom Power in Connecticut.

[**Actions:** Bellows to contact Frank Gabrielli about Fall 2008 plans.]

Symposium

A Symposium was held on Friday morning, October 26, with topics as described on the attached agenda.

Respectfully submitted,
Allan Harvey, Subcommittee Secretary

Preliminary Agenda: ASME Subcommittee on Properties of Water and Steam

Location: Siemens Power Generation, Orlando, FL Q2 2S15-01

Time: Thursday, October 25, 2007, 8:45 AM to 5 PM

- 1. Approval of Agenda**
- 2. Review of Action Items from Spring 2007 Minutes**
- 3. ASME Steam Tables book and booklet**
 - 3.1. Report on sales Allan Harvey
 - 3.2. Plans for Second Edition of book Harvey, All
 - 3.3. Possible cooperation with Springer Verlag All
- 4. ASME Software for IAPWS-IF97**
 - 4.1. Report on sales Allan Harvey
 - 4.2. Technical support, bugs John Gallagher, Allan Harvey
 - 4.3. DLL/Excel product Bill Parry
 - 4.4. Future plans (cooperation with Kretzschmar?) Parry, All
- 5. U.S. Subcommittee and IAPWS Web pages** Allan Harvey
- 6. Update on implementation of general/scientific formulation** Allan Harvey
- 7. Report on transport properties** Dan Friend
- 8. IAPWS issues**
 - 8.1. IAPWS Awards Dan Friend
 - 8.2. Highlights of 2007 meeting in Lucerne Dan Friend
 - 8.3. IAPWS documents for consideration Dan Friend
 - 8.4. Current WG activities Harvey, Parry, Bellows, Lvov
 - 8.5. Preview of 2008 ICPWS in Berlin Allan Harvey
- 9. Membership and Officers** All
 - 9.1. Chairmanship succession Bellows, All
- 10. Old Business**
 - 10.1. Books to sponsors of 2001 meeting Bellows
 - 10.2. Royalties Bellows, Harvey
- 11. New Business**
 - 11.1. 5-year plan for committee Bellows, All
- 12. Next Meeting – Time, Place, etc.**
 - 12.1. Gaithersburg meeting April 2008 Harvey
 - 12.2. Fall 2008 location and timing Bellows, All
- 13. Adjournment**

Seminar on Thermophysical Properties and their Uses

Location: Siemens Power Generation, Orlando, FL Q1 4E16

Time: Friday, October 26, 2007, 9:00 AM to Noon

Allan Harvey, National Institute of Standards and Technology, "Steam Tables: Past, Present, and Future"

William T. Parry, GE Steam Turbine, "Turbine Stage Design Fundamentals"

James Bellows, Siemens Power Generation, "Mass Transfer and Deposition of Impurities in Steam Turbines"

To be determined, talk on Siemens Use of Working Fluid Properties

General discussion of properties of working fluids and needs for thermophysical and transport properties