

**THE INTERNATIONAL ASSOCIATION  
FOR THE PROPERTIES OF  
WATER AND STEAM**

**MEMBERS**

Argentina and Brazil  
Britain and Ireland  
Canada  
Czech Republic  
Denmark  
France  
Germany  
Italy  
Japan  
Russia  
United States of America

**ASSOCIATE MEMBERS**

Greece

**EXECUTIVE SECRETARY**

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**Minutes  
of the  
General Meeting  
of the  
International Association for the Properties of  
Water and Steam**

**Kyoto, Japan  
31 August 2004**

**Prepared by: Barry Dooley**



**Minutes of the  
General Meeting  
of the  
International Association for the Properties of  
Water and Steam  
Kyoto, Japan  
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Tuesday, 31 August 2004, 5:25pm

IAPWS President Watanabe opened the General Meeting and welcomed the 57 people in attendance.

1. Adoption of Agenda

A preliminary agenda had been circulated to all IAPWS members and to the IAPWS website by the Executive Secretary in April 2004. Copies of this agenda were also available for everybody at the meeting. There were no suggested changes to the agenda and thus the President requested that it be adopted. It forms Attachment 1 of these minutes.

2. President's Report on Activities of IAPWS 2000 - 2004

President Watanabe next provided his report on IAPWS and EC activities since the last General Meeting in Toronto, Canada in September 1999:

- 2.1 The Argentinean national committee had formed a joint membership with Brazil and become the Argentina and Brazil Binational Association (ABBA). The UK committee had formed a joint membership with Ireland and become the British and Irish Association for the Properties of Water and Steam (BIAPWS). Greece had become a new Associate member of IAPWS.
- 2.2 The four IAPWS Working Groups continued to be very active. The Industrial Calculations (IC) WG had changed their name to Industrial Requirements and Solutions (IRS) WG.
- 2.3 Attachment 2 delineates the locations of the annual meetings of the EC and the past presidents.
- 2.4 The Statutes and By-Laws were amended at the Kyoto EC Meeting to remove some duplication in the existing Statutes and By-Laws, and to introduce the latest IAWPS Awards (Honorary Fellow, Gibbs Award and Helmholtz Award). The President asked if there were any comments or

objections. None were raised so the Amendments were approved by the General Meeting .

- 2.5 The following people had been made IAPWS Honorary Fellows since the last General Assembly: J.R. Cooper, J. Sengers, B. LeNeindre, O. Sifner, A. Nagashima, R. Fernandez-Prini, and K. Daucik.
- 2.6 The President next delineated the Releases, Guidelines, Advisory Notes and ICRNs that were currently in existence and made note of those issued since the last General Meeting. These are provided in Attachments 3 - 6. He also indicated that these products are listed on the IAPWS Web site.
- 2.7 The President finalized his report by asking if anybody had any questions or other items to add. There were no other items.

3. Executive Secretary's Report on Activities of IAPWS 2000-2004

The Executive Secretary provided information on the IAPWS financial situation. The record of the two IAPWS Bank Accounts was presented.

The Executive Secretary also indicated that the IAPWS Financial records had been audited and approved each year by VDI in Germany and Mr. Miyagawa in Japan.

The IAPWS Dues Structure had remained the same.

4. Selection of Host Country and Year for the 15th ICPWS

The Executive Secretary next raised the issue of the location for the next ICPWS and indicated that no National Committee had come forward and offered to host the 15<sup>th</sup> ICPWS in 2008. He then indicated that the Britain and Ireland Committee had been given until the end of 2004 to have first refusal to host the next ICPWS. The German Committee had asked if they would be the backup.

5. Proposed Activities During Period to Next ICPWS

The President indicated that member countries faced certain problems but that IAPWS was in good shape as evidenced by the attendance of about 230 people at the 14<sup>th</sup> ICPWS. He indicated that at the first international conference there had been 24 people in attendance. One major challenge for IAPWS is the current activity of the EC to restructure the organization to reflect the current industry directions. He particularly wanted to mention fuel cells and nuclear power, which needed to be strengthened within IAPWS.

IAWPS has a strong website which generates lots of interest and promulgates much information on water and steam across a wide audience.

The future challenges for IAPWS are to engage new member countries and to develop working relationships with other organizations

6. New Business

The President requested if there were any items of new business. None were raised.

7. Adjournment

The General Meeting adjourned at 5.57pm.

**AGENDA  
for the  
GENERAL Meeting  
of  
IAPWS**

**Kyoto, Japan. 31 August 2004**

**Tuesday, 31 August 2004. 5:25pm**

Opening Remarks and Welcome by IAPWS President

1. Adoption of Agenda
2. President's Report on Activities of IAPWS 2000-2004
  - 2.1 Membership
  - 2.2 Working Group Activities
  - 2.3 Annual Meetings
  - 2.4 Proposed Statutes and By-Laws Changes
  - 2.5 Honorary IAPWS Fellows
  - 2.6 IAPWS Products
    - 2.6.1 Releases
    - 2.6.2 Guidelines
    - 2.6.3 Advisory Notes
    - 2.6.4 ICRNs
  - 2.7 Others
3. Executive Secretary's Report on Activities of IAPWS 2000-2004
  - 3.1 Financial, Auditors and Dues
4. Selection of Host Country and Year for the 15th ICPWS
5. Proposed Activities during Period to Next ICPWS
6. New Business
7. Adjournment



**IAPWS Annual Meetings and ICPWS**

<b><u>Place</u></b>	<b><u>Year</u></b>	<b><u>ICPWS</u></b>	<b><u>President</u></b>
Giens, France	1974	8th ICPWS	Vodar (France)
Ottawa, Canada	1975		Kestin (USA)
Kyoto, Japan	1976		Kestin (USA)
Moscow, USSR	1977		Bradly (UK)
Washington, USA	1978		Bradly (UK)
Munich, Germany	1979	9th ICPWS	Grigull (Germany)
London, UK	1980		Grigull (Germany)
Prague, Czechoslovakia	1981		Tanashita (Japan)
Ottawa, Canada	1982		Tanashita (Japan)
Tokyo, Japan	1983		Sytchev (USSR)
Moscow, USSR	1984	10th ICPWS	Sytchev (USSR)
Washington, USA	1985		Hill (Canada)
Dusseldorf, Germany	1986		Hill (Canada)
Reading, UK	1987		Grigull (Germany)
Vancouver, Canada	1988		Grigull (Germany)
Prague, Czechoslovakia	1989	11th ICPWS	Pichal (Czechoslovakia)
Buenos Aires, Argentina	1990		Pichal (Czechoslovakia)
Tokyo, Japan	1991		Levelt Sengers (USA)
St. Petersburg, Russia	1992		Levelt Sengers (USA)
Milan, Italy	1993		Cooper (UK)
Orlando, USA	1994	12th ICPWS	Cooper (UK)
Paris, France	1995		Watanabe (Japan)
Fredericia, Denmark	1996		Watanabe (Japan)
Germany	1997		Fernandez-Prini (Argentina)
UK	1998		Fernandez-Prini (Argentina)
Toronto, Canada	1999	13th ICPWS	Tremaine (Canada)
Prague, Czech Republic	2000		Tremaine (Canada)
Gaithersburg, USA	2001		Rukes (Germany)
Buenos Aires, Argentina	2002		Rukes (Germany)
Denmark	2003		Watanabe (Japan)
Japan	2004	14 <sup>th</sup> ICPWS	Watanabe (Japan)

**CURRENT IAPWS RELEASES AND SUPPLEMENTARY RELEASES (August 2004)**

- Supplementary Release: "Backward Equations for the Functions  $T(p,h)$ ,  $v(p,h)$ , and  $T(p,s)$ ,  $v(p,s)$  for the Region 3 of the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam". (August 2003).
- Supplementary Release: "Backwards Equations for Pressure as a Function of Enthalpy and Entropy  $p(h,s)$  to the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam". (September 2001).
- Revised Release: "IAPS Formulation 1985 for the Thermal Conductivity of Ordinary Water Substances". (September 1998). (This release replaces the corresponding release of November 1985).
- "Revised Release on the IAPS Formulation 1985 for the Viscosity of Ordinary Water Substance". (September 1997). (This release replaces the corresponding release of 1985).
- "Release on the Refractive Index of Ordinary Water Substance as a Function of Wavelength, Temperature and Pressure." (September 1997) (This release replaces the corresponding release of 1991).
- "Release on the Static Dielectric Constant of Ordinary Water Substance for Temperatures from 238 K to 873 K and Pressures up to 1000 MPa.". (September 1997). (This release replaces the corresponding release of 1977).
- "Release on the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam." IAPWS –IF 97. (September 1997) (This release replaces the 1967 IFC Formulation for Industrial Use).
- "Release on the IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use." (September 1996) (This release replaces the corresponding release of 1984).
- Release: "Surface Tension of Heavy Water Substances ". (September 1994). (This is a revision of the 1985 Release).
- Release: "Surface Tension of Ordinary Water Substance". (September 1994). (This is a revision of the 1976 Release).
- "Release on the Pressure along the Melting and Sublimation Curves of Ordinary Water Substance". (September 1993). (This is a revision of the 1989 Release).
- IAPS Supplementary Release: "Saturation Properties of Ordinary Water Substance". (September 1992). (This is a revision of the 1986 Release).
- Release: "Values of Temperature, Pressure and Density of Ordinary and Heavy Water Substances at their Respective Critical Points". (September 1992) (This is a revision of the 1983 Release).

### **Attachment 3**

- Release: "IAPS Formulation 1984 for the Thermodynamic Properties of Heavy Water Substance". (September 1984).
- Release: "Viscosity and Thermal Conductivity of Heavy Water Substance". (September 1982. Revised February 1984).
- Release: "Ion Product of Water Substance". (May 1980).

**CURRENT IAPWS GUIDELINES (August 2004)**

- Guideline: "Tabular Taylor Series Expansion (TTSE) Method for Calculation of Thermodynamic Properties of Water and Steam Applied to IAPWS-95 as an Example". (August 2003).
- Guideline: "The Use of Fundamental Physical Constants and Basic Constants of Water". (September 2001).
- Guideline: "IAPWS Formulation 2001 for the Thermodynamic Properties of Ammonia-Water Mixtures". (September 2001).
- Guideline: "The Critical Locus of Aqueous Solutions of Sodium Chloride". (September 2000).
- Guideline: "Equilibrium Constant for the Distribution of Gaseous Solutes between Steam and Water". (September 1998).
- Guideline: "Solubility of Sodium Sulfate in Aqueous Mixtures of Sodium Chloride and Sulfuric Acid from Water to Concentrated Solutions, from 250°C to 350°C". (September 1994). (This is a revision of the 1990 Guideline).
- Guideline: Solubility of Simple Apolar Gases in Light and Heavy Water at High Temperature. (September 1993).
- Guideline: "Electrolytic Conductivity (Specific Conductance) of Liquid and Dense Supercritical Water from 0°C to 800°C and Pressures up to 1000 MPa". (May 1990).

**CURRENT IAPWS ADVISORY NOTES (August 2004)**

- Advisory Note No. 1: “Uncertainties in Enthalpy for the IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use (IAPWS-95) and the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam (IAPWS-IF97)”. (August 2003).

**IAPWS CERTIFIED RESEARCH NEEDS (ICRNS) (AUGUST 2004)**

1. Evaluation of Binary Nucleation Models. Issued September 1993. Needs Revision to extend to September 2004. IAPWS Contact: F. Sigon.
2. Solubility of Sodium Sulphate in Superheated Steam. Issued September 1993. Expired September 2001. IAPWS Contact: K. Daucik. Closing Statement, October 2001.
3. Solubility of Spinels in the Chemical Conditions of Nuclear Reactors. September 1993. Issued September 1993. Expired September 1996. Closing statement prepared. IAPWS Contacts: D. You.
4. Interaction Between Sodium Salts (Phosphates, Sulfates, Silicates, Borates) and Transition Metal Oxides. Issued September 1993. Closed September 1996. IAPWS Contact: J. Stodola.
5. Origin, Behaviour, and Fate of Organics in the Power Cycle. Issued September 1993. Needs Revision to extend to September 2004. IAPWS Contact: R. Gilbert.
6. Thermophysical Properties of Ammonia-Water Mixtures. Issued June 1994. Closed September 2002. IAPWS Contact: W. Parry. Closing Statement, July 2002.
7. Carryover Coefficients of Salts and Metal Contaminants in Boiler Water. Issued June 1994. Expired June 1997. Closed September 1999. IAPWS Contact: P. Tremaine.
8. Development of an Accurate External Reference Electrode for Use in High Temperature and High Pressure Aqueous Solutions. Issued August 1994. Expired August 1997. Closed September 1998. IAPWS Contact: S. Lvov.
9. Thermodynamic Models for Transition-Metal/Water Systems under Steam Generator Conditions. Issued September 1994. Closed September 2000. IAPWS Contact: P. Tremaine
10. pH Measurements and Potentiometric Studies of Supercritical Aqueous Solutions. Issued May 1996. Extended to September 2002. IAPWS Contact: S. Lvov.
11. Properties of Salts in Steam. Issued May 1996. Closed September 2001. IAPWS Contacts: D. Palmer and R. Fernandez-Prini. Needs Closing Statement.
12. Kinetics of the Oxygen and Hydrogen Electrode Reactions in Subcritical and Supercritical Aqueous Systems. Issued September 1998. Closed September 2001. IAPWS Contacts: S. Lvov and D. Macdonald. Needs Closing Statement.
13. Surface Tension of Aqueous Solutions. Issued September 1998. Needs Revision to extend to September 2004. IAPWS Contacts: F. Sigon and F. Gabrielli.

## **Attachment 6**

14. Thermophysical Properties of Humid Air and Combustion-Gas Mixtures. Issued July 2002. Expires September 2005. IAPWS Contacts R. Span and F.L. Blangetti.
15. Thermodynamic Properties of Metastable Steam. Issued July 2002.Expires September 2005. IAPWS Contact: B. Rukes.