

**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 Meetings
of the
Executive Committee
of the
International Association for the Properties of
Water and Steam**

**Gaithersburg, USA
September 9 - 14, 2001**

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Minutes of the Meetings
of the
Executive Committee
of the
International Association for the Properties of Water and Steam
held in
Gaithersburg, USA
9-14 September 2001

Plenary Session. Monday, 10 September 2001

The new President of IAPWS, Dr. Bert Rukes, welcomed the EC and other IAPWS members to Gaithersburg for the EC and WG Meetings of IAPWS. He then asked the Chairman of the US National Committee, Dr. Alan Harvey, to welcome IAPWS to Gaithersburg and NIST. Dr. Harvey introduced the US National Committee Delegate to IAPWS, Dr. Anneke Levelt Sengers. Dr. Levelt Sengers gave information on the location and the weeks activities. Dr. Harvey then recognized the sponsoring organizations for the meetings: the US National Committee (sponsored by ASME and EPRI), NIST Chemical Science and Technology Laboratory, Siemens Westinghouse, and GE. He also mentioned that this was the Centennial of NIST. Next he asked Dr. Hratch Semerjian, Director, Chemical Science and Technology Laboratory to welcome the IAPWS delegates.

The President then officially opened the 2001 EC Meetings by introducing the National Delegates. Each of the member countries of IAPWS was in attendance with the exception of Russia.

1. Adoption of Agenda

A provisional agenda had been circulated to all IAPWS members by the Executive Secretary in May 2001. The President indicated three additions to this agenda, and then requested any other additions and changes to the agenda. There were no further suggestions for additional items. The agenda was then approved by the heads of all National Delegations and forms Attachment 1 of these minutes.

2. IAPWS Business and Appointment of Committees

2.1 Press Release.

The President asked Dr. Bellows, Dr. Bignold and Mr. Cooper to serve on this Committee. The Press Release is discussed in Minute 18.3 and Attachment 14.

2.2 Evaluation Committee on International Collaboration.

The President indicated that no proposals had been received prior to the meeting. The President reminded the EC that the Committee to review any proposals received by the end of the day would consist of the WG Chairmen, with the President and Executive Secretary as ex. officio members. He requested that Dr. Friend be the Chairman of the Committee. The discussion of this Committee is reported in Minute 14.1 and Attachment 12.

2.3 Helmholtz Award Committee

The President introduced the second Helmholtz Awardee, Dr. Nobuyuki Matubayasi. He then reminded the EC that the Helmholtz Committee for the 2002 award would consist of the Delegates from Denmark, France, Germany, Italy, and Japan. The President asked Mr. Daucik to be the Chairman and to report back to the EC on Friday with the members of his committee (Minute 15). The procedures to be followed are delineated in the 1999 EC Canada Minutes.

2.4 IAPWS Atlas

The President indicated that at last year's EC Meetings (Attachment 11 to 2000 Minutes), the Atlas committee had suggested that up to \$50,000 may be required from IAPWS to develop the Atlas and that the EC had agreed in principle. He also noted that drafts of all chapters should have been received by the Editors before the 2001 EC Meeting. He then requested that Dr. Palmer provide an update.

Dr. Palmer indicated that:

- the Editors had only received two draft chapters to date
- the lead author of the Nuclear Chapter had been ill, but that he was hopeful that the chapter would still be prepared
- the authors should assemble with the Editors during the week, and
- the latest estimate for preparing the chapters into a uniform approach was nearer to about \$25,000.

Following a couple of questions by the Japanese and French delegates, the President requested that Dr. Palmer provide an update of the activities to the EC on Friday. This is reported in Minute 16.

2.5 IAPWS on the Internet (IAPWS Website www.IAPWS.org)

The President indicated that there were two items on this subject.

First the President invited Dr. Harvey to provide the EC with a status report on the website. Dr. Harvey reported that the following items had been installed on the IAPWS web site since the last EC Meeting:

- The text of all the IAPWS Releases and Guidelines
- Information on IAPWS meetings
- Prague Minutes
- Three new frequently asked questions (FAQ).

He then indicated that about 8000 pages are served each month, which is probably equivalent to about 1,500 people/month. The most frequently requested documents are the new property formulations, member country reports included in the minutes, and the Releases and Guidelines. In the future there are plans to expand the FAQ, to develop versions of the Releases and Guidelines with increased quality and content accessibility, and to provide a search capability.

Dr. Friend asked if the Statutes and By-Laws could be put on the web site. The President requested that discussion should take place during the week and be reported to the EC (Minute 18.4).

Secondly, the President invited Dr. Friend to provide a report on the committee, which had been formed in Prague to address putting IAPWS software onto the IAPWS Website. Dr. Friend provided a detailed discussion of the results of this “Electronic Download Committee” (Dr. Friend, Mr. Cooper and Mr. Miyagawa). This is provided as Attachment 2. The bulleted numbers on this attachment refer to items in the 2000 Prague minutes.

The President thanked the Committee for an excellent job. He then requested first, that copies of this Attachment be provided to all National Committees, WGs, and the IAPWS Executive, and secondly that further detailed discussion should follow at the Friday EC Meeting after review during the week. This discussion is provided in Minute 17.

2.6 Other Business Considered to Require Special/Extensive Discussions

The President asked the EC if there were any other items that needed to be raised. None were suggested.

3. EC Mandate to Working Groups and Membership

3.1 Releases, Guidelines and Certified Research Needs.

The President reported that in January 2001 the Executive Secretary had sent one Guideline (IAPWS Formulation for the Thermodynamic Properties of Ammonia-Water Mixtures) out for postal ballot to National

Committees. Comments had been received from the Czech Republic and Japanese National Committees. The President charged Dr. Friend with dealing with these comments during the week and ensuring that all National Committee delegates were appraised of the resolutions prior to the EC Meeting on Friday so that the Guideline could be approved by the EC.

The President next indicated that another Supplementary Release (Backward 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) had been sent by Mr. Miyagawa to all National Committees for review. This Release also needed to be addressed during the week and again the National Committees had to be appraised of the results of any changes, so that the EC could vote at the EC Meeting on Friday

The President asked the Executive Secretary to review the needed actions required by the WGs during the week for the ICRNs. PCC should address ICRNs 1, 2, 5 and 13. PCAS should address ICRNs 9, 10, 11, and 12. TPWS needs to address ICRN 6. The results of these discussions are included in the WG Reports to the EC (Minutes 7, 9, and 10).

3.2 IAPWS Electronic Minutes

The President asked the EC if anybody had had any problems in downloading the 2000 IAPWS Minutes from the IAPWS Website. He then confirmed that in 2001 copies of the minutes would not be mailed to members and that they would be available on the Website. Hard copies of the Minutes can be requested from the Executive Secretary.

3.3 Membership List

The President requested that the WGs verify their membership and carefully review the IAPWS membership list. He also indicated that IAPWS has an exact procedure for adding new members, and requested that the WGs discuss whether a policy is required for “non-active” members.

3.4 IAPWS Structure

The President reminded the EC briefly of the current structure that was developed in 1990 in Argentina. He then requested the WGs to review whether it was now time to address another restructuring.

4. Preview by WG Chairmen of Weeks Activities

President Rukes requested each WG chairman to provide an overview of their respective planned meetings and activities throughout the week. The details of these WG meetings are covered in detail in Minutes 7, 8, 9, and 10

Activities During the Week

Following this Plenary EC Session, the second IAPWS Helmholtz Award Lecture was provided by Dr. N. Matubayasi from Kyoto University. The President presented the Award.

The first day activities of the WGs and Executive Committee were followed by WG meetings from Monday–Thursday. All IAPWS activities were disrupted on Tuesday, September 11, 2001 by the terrorist attack on the United States. The meetings were continued on Wednesday, September 12, 2001. The IAPWS Symposium “Electric Power of the Future” planned for Wednesday, September 12, 2001 was cancelled except for one presentation because the speakers were not able to reach Gaithersburg on time. The planned Symposium program is given in Attachment 3 and the only presentation was by Mr. Ikemoto.

The IAPWS participants were invited to tour some of the NIST facilities on Thursday. This program is provided as Attachment 4.

The full IAPWS program for the week is shown in Attachment 5.

Executive Committee Meeting. Friday 14 September 2001

President Rukes opened the continuation of the EC Meeting at 9:00am. All members of IAPWS were present except Russia. He first asked if there were any additional items that should be added to the Agenda. None were suggested.

5. Acceptance of Minutes of Previous Meeting

President Rukes asked for comments and changes to the minutes of the EC meeting held in Prague, September 2000. None were provided, thus the 2000 Minutes were accepted.

6. President’s Report

President Rukes provided the following comments:

- this had been a normal year for IAPWS with work progressing on the Atlas and on Guidelines and Releases

- the “electronic download committee” had worked hard since the EC in 2000 to develop a framework for installing IAPWS software products on the IAPWS Website. Much further discussion will be needed on this item.
- these activities should not limit the use of the website
- there was good news about membership with one new proposed Associate member, one new joint committee, and the prospect of another new Associate Committee
- Professor Watanabe had been nominated by the Japanese National Committee to be the IAPWS Vice-President for 2001 and 2002.

7. Report and Recommendations of Thermophysical Properties of Water and Steam Working Group (TPWS)

Chairman Friend highlighted the following activities from the TPWS working sessions during the week, some of which had been joint meetings with IC and other with PCAS. Full minutes can be found in Attachment 6.

- 7.1 The two WGs TPWS and IC recommend approval of the Supplementary Release on Backward Equations for $p(h,s)$.

The EC approved this new Supplementary Release unanimously.

The proposer’s code for $p(h,s)$ should be given to each National Committee as a supplement to the IAPWS-IF97 code.

- 7.2 The Task Group on backward equations for region 3 will proceed with the development of $T(p,h)$ and $T(p,s)$ equations; the specifications for this task have been accepted in principle by the two WGs. The chair of IC will conduct an informal survey to determine the need for such a formulation. Upon receipt of results, the TG will attempt to complete the equations at next year’s IAPWS meeting.
- 7.3 The Task Group on transport properties will continue to work on the development of formulations for viscosity and thermal conductivity of water.
- 7.4 Mr. Cooper and Professor Wagner have been added to the Task Group on thermodynamic properties of D₂O with an initial task of looking at the results of the change in temperature scale for verifying the status of the current release. Professor Svishchev will consult with the Canadian National Committee to determine the importance of a new D₂O formulation for the Canadian nuclear power industry. Pending the results of these activities, further work on development of new formulations for both thermodynamic and transport properties are suspended. However, Professor Sengers and his group have recently published two relevant papers: on the D₂O critical point and on the D₂O -H₂O critical line, and

Dr. Harvey and colleague have worked on the vapor pressure curve for D₂O as part of their effort on the IAPWS monograph.

- 7.5 The WG recommends approval of the Guideline on Fundamental Constants, after very minor revision (to change the name of a relevant standards organization from BIPM to CCM and CIPM); the WG recommends that this Guideline be forwarded to all WG chairs and used where possible within all IAPWS activities and products.

The EC approved this new Guideline unanimously.

- 7.6 Mr. Cooper will continue as liaison with the IEC.
- 7.7 A member of the WG will coordinate with the Britain and Ireland National Committee for an informal contact with Professor Franks regarding the possibility of accurately reflecting IAPWS work in any future versions of his monograph on water.
- 7.8 A Task Group consisting of Professor Wagner, chair, Dr. Harvey, and Mr. Weber was formed to draft an “IAPWS *Informatory Note* on the Uncertainties of Steam Properties Calculated in IAPWS-IF97.” A draft of the document will be circulated among members of IC WG by about 30 April 2002, with expected circulation to the National Committees and the Executive Secretary for possible approval at the 2002 IAPWS meeting. The document will contain charts depicting uncertainty regions for several key properties.

At this stage the President indicated that New Products would be discussed later (see Minute 18.4).

- 7.9 A Workshop on Molecular Simulation of Water and Aqueous Systems was organized by Professor Svishchev and held in joint session with TPWS and PCAS.
- 7.10 Dr. Anderko gave a presentation on mixtures of CO₂ + H₂O + NH₃; as this system may be of interest to PCC, there is consideration of a future guideline in this area; additionally, there may be an ICRN concerning solution properties of the carbamate ion (NH₂O₂⁻) which is the biggest unknown in the study of this system.
- 7.11 A presentation by Dr. Bellows gave an overview of industrial interest in combustion gas properties; this topic will be continued next year with a presentation concerning calculation of certain properties, with the possibility of future IAPWS work in this area.
- 7.12 The issues raised by several National Committees concerning the draft Guideline on the IAPWS Formulation 2000 for the Thermodynamic Properties of Ammonia-Water Mixtures were reviewed; the WG

recommends approval of the draft dated September 2001, which was circulated during the week and which contains only very minor revisions of the version sent out for postal ballot. The WG recommends that the current ICRN on ammonia-water mixtures be terminated as scheduled; there may be a future ICRN next year that focuses on outstanding issues for this mixture.

The EC approved this new Guideline unanimously.

The EC approved unanimously the closing of ICRN #6.

Action: Mr. Parry needs to provide a closing statement for ICRN #6.

- 7.13 The report on the international collaborative project (USA and Russia) entitled *An Experimental Study of the $C_V T_x$ Properties and Phase Boundary for an Aqueous Methanol Mixture ($0.5 \text{ H}_2\text{O} + 0.5 \text{ CH}_3\text{OH}$) in Wide Ranges of Temperature and Pressure including the Critical Region* was circulated and discussed. This project was considered successfully completed, with publication of the final experimental results expected in about 1 year.
- 7.14 The WGs TPWS and IC agreed with the suggested new IAPWS product, “IAPWS Documentation and Software for the Tabulated Taylor Series Method ... ;” the WGs agreed that when software is an integral part of an IAPWS product it should be included on the IAPWS web site; the WGs recommend against establishing a “software review” committee; the WGs recommend that the core code for IAPWS-IF97 be included on the IAPWS web site; the WGs recommend that providing code for other IAPWS products should be considered on a case-by-case basis; the WGs recommend formation of an EC task group to examine issues and work toward getting tables of coefficients, etc. more easily accessible from the IAPWS web site; the WGs recommend against developing new IAPWS tables and charts to be available on the IAPWS web site; the WGs recommend that a copyright and liability notice be provided on the web page before downloading and within any IAPWS source code; a recommended copyright notice is “Copyright 200x by the International Association for the Properties of Water and Steam. Use of these subroutines is allowed in all countries, provided that attribution is given to the International Association for the Properties of Water and Steam;” however the WGs recommend that the EC seek legal advice on the wording (especially of the liability statement) so as to avoid liabilities; the WGs recommend that because these are significant policy issues, the statutes and bylaws be reviewed so that any appropriate modifications can be considered. [Note that the concept of “informatory note,” Minute 7.8, may also be considered in such a review.]

At this stage in the discussion, the President indicated that full discussion of these items would be included later (see Minutes 17 and 18.4).

- 7.15 The Task Group on computer simulation (joint between TPWS and PCAS) includes I. Svishchev, chair, A. Chialvo, R. Mountain, B. Guillot, S. Okazaki, K. Yasuoka and will concentrate on a PVT database for the simple point charge potential model for water as well as on provisional formulations for properties for a model water system.
- 7.16 The joint WGs TPWS and IC recommend that there be no strict attendance requirements for continued membership in a working group, but recommend that the National Committees should review rosters and report to the WGs for possible removal of names from the WG roster.
- 7.17 The WG nominates Dr. Jacobsen for membership in TPWS; the WG notes that J. Yata wishes to resign from the TPWS, and the chair will write to express thanks for his years of service to IAPWS and the WG.

The EC approved these WG Membership changes unanimously.

- 7.18 The WGs TPWS and IC currently recommend that no changes be made to the basic structure of IAPWS.

At this stage in the discussion, the President indicated that full discussion of this item would be included later (see Minutes 18.2).

8. Report and Recommendations of Industrial Calculations Working Group (IC)

Chairman Miyagawa provided the IC Report to the EC. Full minutes can be found in Attachment 7. Chairman Miyagawa mentioned that there were numerous Joint Sessions with TPWS and that he would only report on those items not covered by Chairman Friend.

- 8.1 A progress report on the evaluation of the TTSE method was given by Mr. Weber at a joint session with TPWS. After much discussion, members of the joint session recommended that the guideline for the TTSE method proposed for next year should have a working title of “Documentation and Software of TTSE Method applied to IAPWS-95 as an Example.” In addition to the practical testing which has already taken place, the consensus of the Joint Session was to include additional theoretical testing. To aid in this additional testing, two members for the Evaluation Task Group were added, Professor Kretzschmar and Ms. Knobloch. The proposer will provide draft documentation and software within four months to the chair of the evaluation Task Group, Ingo Weber.
- 8.2 At a separate meeting, the members of the IC working group discussed changing the name of the working group. After reviewing the mission of

the group, it was decided to recommend the name, “Industrial Requirements and Resolutions”, (IRR).

This item generated much discussion from the EC. Finally a motion was developed to rename the WG “Industrial Requirements and Solutions”, (IRS).

The EC approved this new name for the WG by majority vote with one abstention by the delegate from France

- 8.3 Work on a possible ICRN concerning the Metastable Properties of Steam will be initiated. Dr. Rukes will prepare a draft ICRN for next year’s meeting in Argentina.
- 8.4 The working group recommends Dr. Feller of Siemens-Westinghouse Power Corporation for membership. Mr. Spencer had informed IAPWS that he would like to be removed from the working group roster. Chairman Miyagawa will write a letter to Mr. Spencer thanking him for his long years of dedicated service.

The EC approved these WG Membership changes unanimously.

9. Report and Recommendations of Physical Chemistry of Aqueous Solutions Working Group (PCAS)

Chairman Majer provided the PCAS Report to the EC. Full minutes can be found in Attachment 8. Chairman Majer mentioned that there were numerous Joint Sessions with other WGs during the week.

- 9.1 The Chairman indicated that the activities of the working group over the next few years would consist of the following items. The WG Members in parenthesis will be responsible. It is anticipated that these will not be an IAPWS Guideline or Release, but rather a “product” supported by IAPWS and maybe by a published article:
- pH of water (2002, Lvov)
 - Prediction of standard properties of aqueous non-electrolytes, (2003, Wood)
 - Ion pairing in 1-1 electrolytes (2004, Palmer)
 - “Atlas”
 - Task Group “simulation”
- 9.2 The WG feels that better co-ordination with PCC is needed. The WG has suggested to hold “round table” meetings, where PCC could raise important questions, and PCAS might provide or develop answers. One possibility is that PCAS WG could produce state of the art documents

- 9.3 The Chairman discussed possible coordination of the IAPWS projects with the IUPAC projects, mentioned specifically were standardization, and data evaluation. Some discussion ensued indicating that care was needed to address any overlap.
- 9.4 The WG recommends three new members of PCAS
Dr. Chialvo (Oak Ridge National Laboratory), Dr. A. Plyasunov (Washington University, USA), Dr. M. Ueno (Doshisha University, Japan).

The EC approved these new WG Members unanimously.

The Chairman next reported that there would be no action on removing members from the WG. He indicated that the WG proposes to contact members that have not been active for five years or more.

- 9.5 The WG Chairman indicated that the WG supported the proposal for the International Collaboration Project between ORNL and the Moscow Power Institute.

At this stage in the discussion, the President indicated that full discussion of this item would be included later (see Minute 14.1).

- 9.6 The Chairman proposed the following actions on ICRNs:
- ICRNs # 11 and 12 should be closed
 - ICRN # 10 should continue until September 2002

The EC approved unanimously the closing of ICRNs #11 and 12, and the continuation of ICRN #10 for another three years.

Action 1: Drs. Palmer and Fernandez-Prini need to provide a closing statement for ICRN #11.

Action 2: Drs. Lvov and Macdonald need to provide a closing statement for ICRN #12.

- 9.7 The PCAS Chairman discussed three areas of concern about the future and functioning of IAPWS, which had been raised by the WG during the week:
- National memberships. The Chairman mentioned that in some member countries of IAPWS there were few people and some relied on the enthusiasm of one person
 - Character of meetings (technical versus scientific). Here the Chairman indicated that the WG would like to see a change in the ratio of scientific (ICPWS type conferences) meetings to technical meetings (annual IAPWS type meetings). The WG realizes that ICPWS

Conferences take much work to organize, but would like to see IAPWS trying to combine meetings with other associated meetings and conferences

- More flexible functioning desired. The Chairman indicates that the WG feels that IAPWS should also look at the IAPWS image, because to other groups IAPWS looks like a bureaucratic organization .

The IAPWS President thanked Chairman Majer for his report and ideas, and indicated that the EC would return to these later in the agenda (Minute 18.2).

10. Report and Recommendations of Plant Cycle Chemistry Working Group (PCC)

Chairman Daucik highlighted the key items from the WG meetings and those activities that needed action/approval by the EC. A full written report forms Attachment 9.

10.1. Chairman Daucik first provided the EC with the latest priority list and indicated that during the year explanatory statements had been developed for each.

- Release and transport of copper compounds in the water/steam cycle
- Origin, behaviour and significance of organic compounds in the power cycle
- Solubility of impurities in steam
- Nucleation and condensation in steam turbines
- Physical and chemical processes of concentration and deposition in the power cycle
- Interpretation of potential measurements in plant

10.2. The Chairman next discussed the ICRNs.

- ICRN #1. Evaluation of Binary Nucleation Models. Expires in September 2001. Will require a second revision in 2001 and be prolonged for another three years.
- ICRN #2. Solubility of Sodium Sulphate in Superheated Steam. Expires in September 2001. A closing statement will be prepared.
- ICRN #5. Origin, Behaviour, and Fate of Organics in the Power Cycle. Expires in September 2001. Will require a second revision in 2001 and be prolonged for another three years.
- ICRN #13. Surface Tension of Aqueous Solution. Expires September 2001. Will be revised in 2001 and be prolonged for another three years.

To finalize this item, the Chairman recommended that the Closing Statements for ICRNs should contain an updated reference list.

The EC approved this change unanimously to the ICRN checklist developed and approved in Germany in 1997 (Attachment 9 to German Minutes).

10.3. Chairman Daucik provided four WG comments on the IAPWS Website:

- It should be possible to copy all coefficients
- The text of the ICRNs should be included
- The IAPWS Minutes should be included
- But private information (such as the IAPWS Membership list) should be protected

10.4 The Chairman next discussed Guidelines that are released by other organizations. He reminded the EC that last year IAPWS had sent a letter to the IEC about their impending steam guidelines. During this year's WG meeting, discussion focussed on the pending Guidelines on Boiler Water Chemistry to be issued by the European Boilermaker Association. He suggested to the EC that a similar letter should be formulated suggesting the avoidance of any obligatory limits. The Chairman would prepare a letter to be sent by the Executive Secretary.

The EC approved this suggestion unanimously

10.5 The Chairman recommended to the EC the following WG Membership changes:

- New members: Anthony Banweg (USA), Hiroshi Takaku (Japan), Barry Hughes (Britain and Ireland), and Peter Sajdl (Czech Republic)
- Retiring members: T. Mizuno (Japan), L. Lépine (Canada), R. Riess (Germany), and B. Stellwag (Germany).

The EC approved these WG Membership changes unanimously.

10.6 The Chairman indicated to the EC that he was stepping down as the chairman of PCC, and that the WG recommended the following new officers for PCC:

Chairman: Andre Zeijseink (The Netherlands)
Vice-chairman: Michael Rziha (Germany)
Vice-chairman: Robert Svoboda (Switzerland)

The President first thanked Mr. Daucik for leading the PCC WG for the last five years, and then asked the EC for approval of the new officers.

The EC approved the new officers unanimously.

11. Editorial Committee Report

Chairman Cooper reported that the Editorial Committee had reviewed four IAPWS documents during the period from the EC Meeting in Prague. These were: a) the Guideline on Thermodynamic Properties of Ammonia-Water Mixtures, b) the Supplementary Release on Additional Backward Equations for IAPWS IF 97, c) the Guideline on Fundamental Constants, and d) a cover page explaining deficiencies in the ion product guideline.

Next the Chairman indicated that it was time for him to step down as the chairman after about 14 years in the position. He recommended to the EC that Dr. Harvey becomes the new Chairman and that he remains as a member of the committee.

The EC approved the new Chairman unanimously.

The Japanese delegate wished to thank Mr. Cooper for his remarkable service to IAPWS.

12. Membership and Associates

12.1 The Executive Secretary reported that there were three activities with respect to membership of IAPWS.

- Greece. On behalf of Greece, Professor Marc J. Assael from Aristotle University had forwarded to the Executive Secretary an application to become an Associate Member of IAPWS. The Application was submitted on behalf of the Greek Association of Chemical Engineers and signed by its President, Mr. A. Mpinis. Professor Assael is proposed as the Official Delegate to IAPWS.

The EC approved Greece as an Associate Member of IAPWS unanimously

- Argentina and Brazil. The Executive Secretary next invited Dr. Corti to present to the EC a proposal for a joint country membership. Dr. Corti provided a written proposal, which forms Attachment 10 to these minutes. During a meeting in May 2001, Dr. Corti had met with personnel from Institutes in Brazil and discussed their participation in forming a joint committee. Dr. Benedito Dias Baptista Filho, who is the coordinator of the Brazilian group, indicated that the Brazilians were very supportive and will try to find other partners. Dr. Corti then proposed to the EC that a new joint IAPWS member is formed to replace Argentina. The joint member will be called Argentina and

Brazil, and their joint committee will be the Argentine-Brazilian Binational Committee (ABBC).

The EC approved this new joint Member of IAPWS unanimously

- The Executive Secretary indicated that contact with China had continued through the year through Dr. Hong-Wei Xiang at the Institute of Chemistry of the Chinese Academy of Sciences in Beijing. This followed previous contact with Mr. Guang-Yao Wei in China, which had been based on the contact of Professor Watanabe with Professor Zhu of Tsinghua University.

12.2 Members Defaulting on Dues.

The Executive Secretary indicated that according to the latest Swiss bank account statement (31 August 2001), the following countries had not paid the 2001 IAPWS dues: Argentina, Canada, France, and Russia. In 2000 Argentina and Russia had not paid their dues. Russia had recently paid their back dues for 1997, 1998, and 1999. The Delegate from Argentina had recently indicated to the Executive Secretary that both 2000 and 2001 dues had been paid. The delegate from France indicated that the French dues had been paid very recently.

13. Executive Secretary's Report

13.1 Financial, Auditors and Dues

The Executive Secretary reported that IAPWS was on a sound financial footing with currently over SFrs 159,000 in the Swiss bank account and over \$5,900 in the US account for a total of \$100,617 combined. The status as at 31 August 2001 in the bank accounts had been provided to each National Delegate present at the EC meeting.

The Executive Secretary next reported that the 2000 financial statements had been forwarded to the Auditors in January 2001. Both VDI in Germany and Mr. Miyagawa in Japan had reviewed and approved them. The financial statements for 2000 and the Auditors reports had also been provided to all the National Delegates present.

The Executive Secretary proposed that these organizations continue to act as auditors.

The EC approved this unanimously.

The Executive Secretary proposed to the EC that the dues structure for member countries remain unchanged for 2002.

The EC unanimously agreed to this proposal.

The Executive Secretary also provided a rough estimate of the future expenditures for 2001.

13.2 Time and Place of the 2002 Meetings

The Executive Secretary asked the delegate from Argentina and Brazil to provide a few details of plans for the 2002 meetings.

Dr. Corti provided some initial details of the meeting to be held in Buenos Aires. The initial program forms Attachment 11. The first circular will be provided around February 2002. Dr. Corti's presentation suggested a date straddling the last week in July and the first week in August 2002. This resulted in much discussion and voting for particular weeks by the EC, because of overlaps with an IUPAC conference. An alternate suggestion for the first week of September also caused some problems with some delegates due to overlap with a Thermophysical Properties Conference. Finally the Japanese delegate proposed a motion to allow the Argentina and Brazil Committee to decide on the dates which would maximize attendance from the host countries.

The EC agreed to this motion by majority, with Denmark, Germany and France abstaining.

Dr. Corti then indicated that the joint Argentine Brazilian Binational Committee would choose July 22-26, 2002

14. Guidelines, Releases, Certified Research Needs, International Collaborations

President Rukes indicated that discussion on Guidelines, Releases and ICRNs had been dealt with during the WG presentations.

14.1 International Collaborative Projects.

The President asked Dr. Friend as Chair of the Committee to report on the discussions during the week. Dr. Friend indicated that only one proposal had been received. The details of this proposal are provided in Attachment 12. He indicated that the proposal met all the requirements and technical criteria, and was a high priority for the PCAS and PCC WGs. He then proposed to the EC that this project should be funded

The EC approved this unanimously.

15. IAPWS Honorary Fellowships and Helmholtz Award

The President reported that Professor Nagashima and Dr. Sifner had been elected Honorary IAPWS Fellows, following the established procedure and after unanimous approval through the postal ballot conducted by the Executive Secretary. The Fellowship Award had been presented to Dr. Sifner at the IAPWS Dinner on Thursday evening.

The President read the Citation for Professor Nagashima's award and then requested the head of the Japanese delegation to accept the award and present it to Professor Nagashima at a suitable opportunity in Japan.

The President next discussed the Awards Committee. Dr. Levelt Sengers indicated that she had been a member of the Committee for three years and it was time to step down. The President requested that Mr. Cooper should join Professor Wagner as the members of the Awards Committee, and that the same procedures should be followed for any IAPWS Honorary Fellowships in 2002.

The President then asked Mr. Daucik to name the members of the Helmholtz Award Committee for the 2002 award. The Committee will consist of: Denmark (Mr. Daucik as Chair), France (Dr. Majer), Germany (Dr. Kretzschmar), Italy (Dr. Perboni), and Japan (Dr. Watanabe). Nominations will be due to the Executive Secretary by December 31, 2001, which is one month earlier in this cycle because of the early EC Meetings in 2002.

16. Atlas

The President asked Dr. Palmer for an update on this important IAPWS topic following the initial discussion at the Plenary EC Session on Monday (Minute 2.4). Dr. Palmer provided the latest information on the budget, royalties, editors, title, deadlines, and the review process. The full description is provided in Attachment 13. The budget now proposed was a maximum of \$25,000 but anticipated to be much lower. The immediate deadline is for the editors to receive the first chapter drafts by October 31, 2001 to be able to meet the Publishers manuscript date of November 30, 2002.

17. IAPWS on the Internet

The President requested Dr. Friend to provide an update on the Electronic Download Committee, which he had introduced at the Plenary EC Session on Monday (Minute 2.5). All participants in the IAPWS meetings had received a copy of Attachment 2.

Dr. Friend first wished to remind the EC of the discussion in the TPWS Report to the EC (Minute 7.14) because this discussion updated the recommendations in

Attachment 2. He then proceeded to present each of the bullets and recommendations from the Attachment 2.

The proposed General Policy is outlined in Recommendation 2 of Attachment 2. However, the stronger language (within Minute 7.14) where “IAPWS should make the code available through its website” should be applied.

With regards to Recommendation 3 to form a Task Group “to ensure that all tables of coefficients, verification tables, etc. are easily accessible from the IAPWS website”, Dr. Friend suggested a committee of two consisting of Dr. Harvey (Chair) and Mr. Cooper (Task Group for Accessibility of IAPWS Information on the Website).

The EC approved this Task Group unanimously.

With regards to Recommendation 4 of Attachment 2 regarding copyright, Dr. Friend indicated that TPWS had suggested a modification (Minute 7.14), and had made a strong recommendation that a liability statement be added to the copyright notice. He indicated that an initial version was provided in Attachment 2. The President then suggested that IAPWS needed legal assistance to develop such a statement. This item lead to much discussion by the EC. Finally a motion was proposed that “Each National Committee of IAPWS should determine, if possible, the legal situation in their own country, and send a statement to the President and Executive Secretary by March 31, 2002”.

The EC approved this motion unanimously.

The President indicated that further discussion would take place on this item at the 2002 EC Meetings in Argentina.

18. New Business

18.1 14th ICPWS

Professor Watanabe reported on the progress for organizing the 14th ICPWS in Japan. He indicated that the dates would be August 29 – September 3, 2004. The venue would be the Kyoto International Conference Hall. A local preliminary organizing committee had been formed. The formation of a Program Committee was discussed and will consist of the IAPWS WG Chairmen, the Executive Secretary, and members of the local organizing committee. Professor Watanabe also mentioned a number of other items, which will need discussion: paper presentations and poster sessions, conference theme, proceedings, possible number of guests, and the financial support.

With regard to the last item, Professor Watanabe indicated that the local organizing committee had reviewed the financial support provided by

IAPWS for the last two ICPWS Conferences. Because of the poor financial situation in Japan, he proposed that the support is increased for the next ICPWS. Such an indication from the IAPWS EC will enable the Japanese Organizing Committee to approach the Government of Japan for a commitment of support. After much discussion concerning whether the support would be a grant or a donation, the following motion was developed: “ IAPWS will provide up to \$25K to support the 14th ICPWS”.

The EC approved this motion unanimously.

The French delegate requested information on the number of Proceedings sold from the last two ICPWS Conferences. The President formulated the following action.

Action: The US and Canadian National Committees will provide to the Executive Secretary the information on how many copies of the proceedings have been distributed or bought following the 12th and 13th ICPWS.

18.2. IAPWS Structure

The President summarized the suggestions included in the WG reports in response to his request at the Plenary meeting on Monday (Minute 3.4). PCC and PCAS had provided a few suggestions. He then indicated that he would like to form a small committee consisting of the WG Chairmen, with Dr. Majer as Chair, and the President and Executive Secretary as ex officio members. This committee should prepare a short document, which can be used as the basis for further discussion in Argentina in 2002.

18.3 Press Release

The President requested Dr Bellows to present the News Release to the EC. This is contained in Attachment 14.

18.4 New Products

The President briefly reviewed the two types of new IAPWS products that had been suggested in the WG’s presentations to the EC: “Informatory Note” and “Documentation and Software”. He then formulated an action:

Action: The editorial committee will review the Statutes and By-laws to determine if any changes are desirable to change the products that IAPWS will issue in the future.

The President indicated that he would form a committee at the start of the Argentina EC Meeting to review this area.

18.5 Review of Progress of Research in Member Countries

As approved at the EC Meeting in Milan, September 1993, the written reports on progress in member countries were not reported to the EC but were distributed to other members and the Executive Secretary during the IAPWS week. They are attached to these minutes as follows:

Argentina	Attachment 15
Britain and Ireland	Attachment 16
Czech Republic	Attachment 17
Denmark	Attachment 18
France	Attachment 19
Germany	Attachment 20
Japan	Attachment 21
Russia	Attachment 22
USA	Attachment 23

19.5 Technical Papers and Participants

There were no papers provided to the Executive Secretary prior to, and during the EC and WG meetings, which were not included in these minutes and attachments.

Attachment 24 provides a list of participants at the EC and WG Meetings in Gaithersburg in 2001.

19.6 List of Members

An up-dated list of members of the Executive Committee, Working Groups, and Honorary Fellows will be developed by the Executive Secretary. This will be forwarded to the Head of each National Committee.

20. Closing Remarks and Adjournment

The President formally closed the 2001 EC meetings at 3:50pm.