Attachment 10

The Argentine National Committee

The International Association for the Properties of Water and Steam

To: Executive Committee IAPWS
Subject: Argentine-Brazil Binational Committee

Mercosur is a regional common market that was created as a media to enhance the commercial and technical links among Argentina, Brazil, Paraguay and Uruguay. The treatise was formalized a few years ago, but grounds for technical and scientific cooperation are being set just now; in that sense, Brazil and Argentina, the main partners of Mercosur, have recently signed treatises for mutual scientific and technological collaborations. This encouraged the ANC to contact some colleagues from Brazil to explore their interest in the activities of IAPWS, and to sound their commitment in taking part of a future IAPWS Argentine-Brazilian Binational Committee.

On May 21, 2001 a meeting took place at the Energy and Nuclear Research Institute (IPEN) in San Pablo, Brazil, to discuss with the colleagues of IPEN and other institutions of Brazil the formation of an Argentine-Brazilian Binational Committee of IAPWS.

The attendants were:

- Dr. Benedito Dias Baptista Filho, Dr. Jorge Baliño, MSc Miriam Cegala and MSc. Waageh Bassel (Instituto de Pesquisas Energeticas e Nucleares - IPEN - San Pablo, Brazil)
- MSc. Marcelo Veloso (Centro de Desenvolvimento de Tecnología Nuclear - CDTN, Belo Horizonte, Brazil)
- Dr.Lamartine Guimaraes and Dr. Mauricio Pinheiro Rosa (Instituto de Estudios Avanzados- Centro Técnico Aeroespacial, CTA, San Jose dos Campos, Brazil)
- Dr. Horacio Corti (Comisión Nacional de Energía Atómica, Buenos Aires, Argentina)

During the event the participation of the Argentine National Committee in the activities of IAPWS was summarized to the local researchers, as well as the expectations and difficulties the members of the ANC visualize in the near future. All the attendants to this meeting considered important the formation of the Binational Committee and expressed their intention to participate in it. A number of future joint tasks were discussed, such as the edition of a bilingual (portuguese/spanish) version of the Steam Tables and the creation of a Web-

site.

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Dr. Benedito Dias Baptista Filho was proposed as coordinator of the Brazilian group and his first action was to prepare a proposal for asking funds to attend the 2001 EC IAPWS meeting and getting institutional permission to participate in a future Binational Committee. These tasks were successfully completed and now Argentina and Brazil are in condition to joint their efforts for a close collaboration in the framework of IAPWS.

Consequently we propose to the EC of IAPWS the formation of a new Argentine-Brazilian Binational Committee (ABBC), which should replace the former ANC. The organization of the 2002 annual meeting of the EC of IAPWS to be held in Argentina will be the first priority of the new Committee.

The ANC visualizes the cooperation with Brazil not only as a way to expand the activities of IAPWS, but also to overcome the negative impact that the increasingly severe economical crisis affecting Argentina has on the scientific and technological community. As a consequence of this crisis, the interaction between the energy industry, which has been privatized, and the public sector (universities and national laboratories) has decreased substantially, local R&D activities have been reduced, and the chances of any sustained overseas international cooperation are uncertain.

The ANC believes that the formation of the Argentine-Brazilian Binational Committee will render our participation in IAPWS as fruitful as it has been in the past.

Dr. Horacio R. Corti
Argentine National Committee - IAPWS

Attachment 11

The Argentine National Committee
International Association for the Properties of Water and Steam.

A proposal for the IAPWS 2002 at Buenos Aires

Submitted to the Executive Committee Meeting, IAPWS
Gaithersburg, September 2001

The Argentine National Committee is pleased to invite members of the Executive Committee and Working Groups of IAPWS to Buenos Aires for their Annual Meeting, July 22 – 26, 2002.

It is the second meeting of the Executive Committee of IAPWS and experts on the properties of water, steam and aqueous solutions to be held in Argentina. The first one took place in 1990, also in Buenos Aires, and represented an important event to consolidate the Argentine National Committee, which became full member of IAPWS in 1994. The IAPWS 2002 meeting will be the first organized by the new Argentine-Brazilian Binational Committee (ABBC).

Time and Venue: The IAPWS Annual Meeting will be held from July 22 – 26, 2002 in Buenos Aires. We consider two possible places for the various meetings:

- The Atomic Energy National Commission, CNEA, (Constituyentes Atomic Center)
- The National Institute of Technology (INTI)

Both institutions have their facilities, including cafeteria and cantina, in the same campus, located 12 km from downtown. INTI also has a conference facility downtown that is being considered as the venue for the One-day Symposium.
Meeting rooms with capacity for 20-50 people will be available and access to Internet and electronic mail will be provided.

Preliminary Program: the organization of the meeting activities will be arranged following the traditional scheme of the IAPWS meetings:

- Meeting of chairmen to finalize agenda will take place at Sunday (July 21)
- EC meeting will take place on Monday morning (July 22) and Friday (July 26)
- WGs separate or joint meetings and Workshop will be scheduled on Monday afternoon, Tuesday and Thursday.
- The International Symposium is scheduled for Wednesday, July 24.

The Symposium organizers are María Laura Japas and Roberto Fernández Prini.
The Symposium title will be defined according with the titles of offered and invited contributions. We expect around 4 contributions of local scientists and engineers (Argentine and Brazil). An extended abstract will be requested to the authors by the end of June 2002; they will be distributed to participants.

Lodging: The meeting hotels will be located in downtown, with easy access to CNEA and INTI. The prices will be between u$s 50 (economy 3 stars) and u$s 100 (4 stars) for a single room and between u$s 60-120 for a double room. Best Western Embassy Hotel (4 stars) offers single rooms with kitchenette (for 1 or 2 persons) at u$s 70-84, and double rooms with kitchenette (for 1 or 2 persons) at u$s 108.

Transportation: the Organizers will provide a bus for participants to reach CNEA-INTI (at 8:30 am) from the hotels and to come back to downtown (5:30 pm). A taxi or limo service will be available at CNEA-INTI at any time during the meeting hours.

Social: an informal Get-together is planned on Sunday July 21, from 18:00 to 20:00 pm in one of the hotels (the meeting of chairmen to finalize agenda will take place there earlier).
The IAPWS dinner will most likely be held on Thursday evening July 25.
A spouses program will be organized, including cultural programs, sight-seeing tours in Buenos Aires and excursions out of Buenos Aires. Information will be available in the first circular (February 2002).

Registration fee: There will be a registration fee which will entitle participants to attend all scientific events, coffee breaks, informal reception, IAPWS dinner, and to receive the extended abstracts of the Symposium.

Information: The ABBC will have information available on the IAPWS WEB site (http://www.iapws.org/mtg2002) and also in the local web site to be created soon. The first circular will be mailed to IAPWS members in February 2002.

On behalf of the Argentine-Brazilian Binational Committee,

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Attachment 12

IAPWS Collaborative Grant Proposal

Investigation of Lithium and Boric Acid Hideout in Pressure Water Reactors under Axial Offset Anomalous Conditions

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Attachment 12

Executive Summary

Yulia Zhgenti is a junior research scientist at MPEI and received her diploma in power plant engineering on water and fuel technology at fossil and nuclear plants in February 2000. She has experience in measuring the behavior of sulfates in water/steam cycles and has taken an active part in research performed within the EPRI-sponsored project, "Turbine Steam Chemistry and Corrosion". The requested collaborative grant will allow Ms. Zhgenti to travel to Oak Ridge to assist in laboratory-scale measurements on the hideout mechanisms of lithium and boric acid is PWRs operating under conditions where AOA occurs leading to reduced efficiency. The idea of this proposal is to provide this young engineer with "hands on" laboratory experience involving a research project that is highly relevant to her chosen field.

Background and Outline of the Project.

For several years, chemists at ORNL in the Aqueous Chemistry and Geochemistry groups have been heavily involved in conducting research on the behavior of metal oxide surfaces in contact with aqueous solutions. New potentiometric techniques were developed to study surface charge build up, the pH of zero surface charge and the specific adsorption of cations and anions to temperatures of 290°C, whereas previously experimental studies were restricted to 90°C. The common findings were that the pHzpc decreases with increasing temperature, perhaps reach a minimum above 250°C and that the capacity of these surface for charge build-up, and hence cation and anion adsorption, also increases dramatically with temperature.

The phenomenon of AOA is generally associated with PWR operation at conditions were localized boiling occurs at the top of the fuel bundle and deposition of crud is observed. Although, not all plants that experience boiling also suffer from the effects of AOA, which is manifested in lithium and boric acid hideout, as well as the appearance of bands of zirconium oxide and nickel oxide in the crud layers. Noting that when the PWR is returned to normal operation, both the lithium and boric acid concentrations initially increase as these species are returned to solution. Controversy exists as to whether the underlying mechanism involves precipitation of lithium borate or adsorption of lithium ions (in conjunction with hydroxide anions and neutral boric acid molecules.

We plan to conduct batch experiments in gold bags containing zirconium oxide and solutions of lithium hydroxide, boric acid, and finally a solution with both solutes present. A preliminary scoping experiment was conducted indicating that the adsorption mechanism appears to be operative. This experiment was conducted at 300 to 360°C over a range of pressure equal to or in excess of the saturation pressure of water. At each temperature the pressure effect will be reversed in order to access the reversibility of the hideout reaction and the kinetics of this process.

Justification

As alluded to in the above summary, the main goal of this collaborative project is to provide this young engineer with international experience and to gain first hand knowledge of applied experimental chemistry as conducted at a fundamental level in a national laboratory. The young engineer will also become familiar with a number of chemical analytical techniques as well as with running the rocking-autoclave, "gold bag" apparatus. She will also get an opportunity to collaborate with other staff chemists and geochemists who are committed to this project. The nature of the problem is directly relevant to nuclear power generation and the problems associated with trying to increase the output of existing PWRs. The problem of AOA is an international one and the underlying cause is poorly understood, even though the onset of manifestation of AOA is readily observable. Therefore, this project falls well within the spirit of the IAPWS international collaborative program. Moreover, engineers and chemists at the Moscow Power Institute have had a long-standing interest in boric acid chemistry as demonstrated by the following references,

1. Samoilov Y. F., Petrova T.I., Lavrova O.I., Lukichev A.M. "Composition of products produced during decomposition of $Na_2B_5O_7$", Proceedings of the MEI "Teplotechnika", 1974, vol. 177.
2. Martynova O.I., Samoilov Y.F., Petrova T.I. "Behaviour of $Na_2B_5O_7$ in water steam system at high parameters", IVUZ Energetika, 1975, N° 7.
3. Martynova O.I., Samoilov Y.F., Petrova T.I. "Determination of dissociation constant and hydrolysis constant of $Na_2B_5O_7$ for aqueous solution at increased and high temperature", Proceedings of the MEI "Water treatment and water chemistry", vol. 238
4. Samoilov Y.F., Petrova T.I., Isaeva E.G. "Conductivity of boric acid solutions at high temperature and pressure", Proceedings of the MEI "Water treatment and water chemistry", vol. 238

Schedule and Budget.

The exact date for the commencement of this project has not been set, although February 2002 is suggested as a possible starting date. We believe that four months would be required for Ms Zhgenti to learn the basic skills required in the manipulation of the experimental apparatus and in conducting the chemical analyses of the samples collected in these experiments.

Return airfare, Moscow to Knoxville,	$2200 (US)
Living expenses in Oak Ridge for four months	$7200 (US)
Total amount requested	$9400 (US)

Attachment 13

Report to the EC of IAPWS on the Status of the "Atlas"

Friday, 14 September 2001

- Budget request of $25,000US for the cost of combining 18 chapters, foreword and appendix into a consistent format for submission to Academic Press on November 31, 2002. The actual amount needed could be significantly less if we are able to iterate between the editors and the authors regarding text format, tables, equations and figures.
- The royalties that will be paid to IAPWS by AP according to the contract is 12% of the net profits. Complimentary copies of the book will be given to the editors and lead authors. The editors will provide their additional copies to IAPWS.
- At this time, drafts of the Foreword (Professor E. U. Franck) and four chapters have been received. Chapter 18 entitled provisionally as "Aqueous Chemistry in Nuclear Power Plants" is in question owing to the poor health of the present lead author. However, as this is likely to be one of the key chapters, particularly in the USA, in the future, we will strive to make sure that this chapter will be included, and if necessary alternative authors will be sought.
- The future ability of Professor Peter Tremaine to serve as an editor of the "Atlas" is in question. He has expressed his willingness to step aside. Therefore, the remaining two editors (Professor Roberto Fernandez-Prini and Dr. Donald A. Palmer) suggest that Dr. David Wesolowski (ONRL, USA) be approached to take over this role. If Dr. Wesolowski is unable to accept this role, we will request that Peter Tremaine access his situation again and either firmly commit to his participation, or allow the two existing editors to continue without a third editor.
- PCAS contends that the title be shortened to read "The Physical and Chemical Properties of Aqueous Solutions at Elevated Temperatures and Pressures", but it was also decided that the term "Atlas", as suggested by Professor Franck, could not be inserted into the title as it has little meaning to the potential readership.
- The deadline for receipt of the remaining manuscripts has been set as October 30, 2001.
- The Britain-Ireland IAPWS committee has kindly offered funds to review (proofread and ensure a consistent style) some or all of the chapters prior to sending the entire package to the company that will carry out the overall formatting of the chapters. Five chosen chapters

will also be reviewed by PCC members for their readability and technical relevance.

- The publisher (AP) will be contacted to obtain more detailed information on the formatting of figures so that authors can adopt a more consistent style that should reduce the necessity of redrawing figures and hence reduce expenses.
- The lead authors will be contacted shortly after this meeting to appraise them of the current situation and changes in deadlines.