ibpsaNEWS

August 1991

International Building Performance Simulation Association, Inc.
Post Office Box 282, Orleans, Ontario, CANADA K1C 1S7

Volume 4, Number 2

NEXT IBPSA MEETING: NICE
IBPSA'S INTERNATIONAL DIMENSION

The next meeting of IBPSA will be held on **Thursday, August 22, 1991,** in conjunction with Building Simulation '91, in Nice, France. The general membership will meet at 6:30 p.m.; the Board of Directors will meet earlier in the week. The meeting location will be announced at Building Simulation '91.

This meeting is open to anyone interested in building simulation; only paid IBPSA members may vote. (For membership information, see the end of this newsletter.)

The primary agenda item for this meeting is a discussion of the international dimension of IBPSA. As stated by IBPSA President Ed Sowell in the May 1991 issue of *ibpsaNEWS*, we must decide "how IBPSA can be structured to meet its responsibilities as an international association to an ever more widely dispersed membership."

At the IBPSA meeting in Indianapolis, a motion was passed requesting that Rik Van de Perre and Ed Sowell jointly author a discussion paper which would contain a proposed organizational structure to coordinate the activities of IBPSA and similar organizations in Europe and other parts of the world.

As this newsletter goes to press, this discussion paper is being distributed to the IBPSA board members for their review and comments. A final paper incorporating the feedback from the IBPSA board will be distributed during Building Simulation '91. It is hoped that a consensus will be reached in Nice that will help launch IBPSA in a more responsive international direction.

NEW IBPSA SECRETARY

Congratulations to Edward C. Knipe who is the new IBPSA Secretary. Ed was nominated at the Indianapolis meeting and has accepted the position as of August 1991. Ed is Chief of Energy and Utilities Programs for the California State University.

Many thanks to our former Secretary, Dwight Beranek of the U.S. Army Corps of Engineers. Dwight has served faithfully as IBPSA's first secretary, and he was instrumental in the initial formation of IBPSA. Thanks, Dwight, for all of your efforts on behalf of IBPSA!

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A SURVEY OF ENGINEERING TOOLS AND INTEGRATED BUILDING SOFTWARE ACTIVITIES

by Henry Amistadi

This article was prepared as part of IBPSA research project RP-90-1. The Appendices have been omitted here. The article will be published, complete with Appendices, as a separate publication in the Fall of 1991.

Abstract

This paper is addressed to research engineers within the HVAC/Energy discipline. In particular it is intended for building research engineers and scientists, developers of HVAC/Energy design software environments, and HVAC/Energy product engineers.

This paper begins with an historical perspective on how building research was conducted prior to the "software and communication revolution."

The first part of the paper describes mathematical and HVAC/Energy programming tools, and higher level mathematical and engineering languages. The use of these tools and higher level languages can greatly improve a researcher's productivity in developing building models.

The second part of the paper provides a survey of software and database developments related to building HVAC/Energy analysis. Integrated building software development approaches include advanced modeling techniques and trends in HVAC/Energy engineering system development. This part of the paper is meant to assist researchers in connecting their models with other models or databases, finding out about other researchers who are doing similar research, or developing new models with consideration of emerging techniques or standards.

1. INTRODUCTION

This paper is addressed to research engineers within the HVAC/Energy discipline. In particular it it is intended for building research engineers and scientists, developers of HVAC/Energy design software environments, and HVAC/Energy product engineers.

Researchers have been developing models since before digital computers were available. Many researchers today began by using computers when card decks were the method used to input a program. The measurements were taken by hand and results were written in log books. Papers and reports were the primary result of their research. Since a building researcher's purpose is to investigate physical science and writing programs was so cumbersome and laborious, computers were used as an auxiliary tool. Researchers conducted their work independently and commonly were unaware of similar research being conducted elsewhere.

As computers became more readily available and easier to use, they were used to perform repetitive calculations and "what if" analyses. Building component models were created to answer simple questions about unsophisticated equipment and building designs. As new technologies developed and an understanding of "whole building" [building envelope and lighting/mechanical interactions] evolved, these additions were added to existing programs. This resulted in the massive, historically based programs that exist today.

The "communication revolution" and changes toward an international climate of cooperation have strengthened the sense of an international research community. The International Building Performance Simulation Association was created to coordinate the international research efforts in building simulation. IBPSA's goals are to establish a joint research agenda, facilitate the exchange of published research and establish methods for the exchange of algorithms.

Today, many building research projects include the development and use of software as part of the investigation. In some cases the software is the primary deliverable. This change from paper to electronic deliverables raises many questions related to information transfer:

How is the software being developed? Are programming tools or higher level mathematical languages being used? Can it be used by other researchers? Is it modular enough to be incorporated into software that is used for HVAC/Energy design? Has it been properly documented and tested?

This paper provides some groundwork towards answering these questions by informing building researchers of software development related to building HVAC/Energy simulation.

The first part of the paper describes mathematical and HVAC/Energy programming tools, and higher level mathematical and engineering languages. The use of these tools and higher level languages can greatly improve a researcher's productivity in developing building models.

The second part of the paper provides a survey of software and database developments related to building HVAC/Energy analysis. Integrated building software development approaches include advanced modeling techniques and trends in HVAC/Energy engineering system development. This part of the paper is meant to assist researchers in connecting their models with other models or databases, finding out about other researchers who are doing similar research, or developing new models with consideration of emerging techniques or standards.

There are two major approaches towards developing software environments for the design of buildings. In the first case, the designer makes the decisions and the software is the tool he uses to build the system. This designer's requirements are that the tool kit is complete and that the tools will work together. In the second case, the designer uses design advisors — commonly knowledge-based systems — to assist him in making decisions. This paper focuses on activities related to the first case.

There are efforts underway to create data structures that can be used across the building industries. For example, data must be communicated between architects, engineers and builders. For any industry specific standard to be fully adopted, this global perspective must be considered. However, this paper will not address the global approach directly, but will focus on efforts related to developing data models and establishing interchange formats in the HVAC/Energy engineering disciplines.

2. PROGRAMMING TOOLS AND HIGHER LEVEL LANGUAGES

In this section programming tools and higher level languages are discussed which can greatly assist research, product, and software engineers in improving their productivity and the flexibility of their software implementation.

A programming tool is a collection of source code functions that are accessed while programming in your preferred programming language such as Fortran, Pascal, C, etc.

Higher level languages allow the user to describe a problem in a manner that they would "by hand". For example, higher level mathematical languages are based on mathematical notation as it is portrayed in mathematics text books.

Higher level graphical, mathematical, engineering and simulation languages exist which can be applied to building modeling. Section 3 will address generic and HVAC/Energy specific tools for engineers/programmers and higher level mathematical and engineering languages for engineers/modelers.

2.1 PROGRAMMING TOOLS

With the revolution in computer software, many tools and advanced programming languages are available for software development. Extensions to some existing programming languages (C++ and Advanced Pascal) offer object oriented programming capabilities. Tool kits are available that supply functions, procedures, and objects for different programming languages. Libraries are available that assist programmers in developing a user interface, plotting data, and performing mathematical operations. Product names for mathematical libraries include IMSL, ULI, ACSL, NAG, Numerical Recipes, and Fortran Scientific Subroutine Library.

A collection of HVAC/Energy functions which model the components of a building system are called HVAC/Energy tool kits. ASHRAE has sponsored research projects to develop tool kits for use in writing HVAC/Energy programs. Primary and secondary system tool kits are currently being developed, and weather and building load tool kits are planned. Other ASHRAE sponsored research projects will develop databases of duct fittings and room transfer function coefficients.

An increasing number of ASHRAE sponsored research projects require documented software as deliverables. Due to this trend, ASHRAE is developing a policy for algorithms and software development related to ASHRAE sponsored research. This policy will probably include documentation, user interface and format requirements.

2.2 HIGHER LEVEL MATHEMATICAL LANGUAGES

Spreadsheets were quickly taken up by engineers for automating calculations. Lotus 123 became an industry standard, and other spreadsheet companies developed compatibility. Today, we have "the next generation" of calculational tools which are software implementations of mathematical, statistical and simulation languages. Program names include Mathematica, Mathcad, Derive, Maple, Gauss, MACSYMA and Mercury which go beyond the limits of spreadsheets.

Some of these packages are in themselves the documentation since they are written in mathematical notation. They eliminate the need to copy rows since they use matrixes and vectors. Some of these packages have integrated text, equations and 3-dimensional graphics. Some packages have macro languages for generating models. All packages

have interpreters that process the calculations and have the ability to present graphical results. Some have the ability to compile the calculation. This limits the functionality to the choice of inputs you make, but minimizes the overhead required to support the math language. Some packages allow these "compiled calculations" to be included in Fortran or C programs.

2.3 COMPUTER-AIDED ENGINEERING

Computer-Aided Engineering [CAE] software originally developed for structural analysis of aircraft with mainframe computers are now available for the PC. There are many companies offering integrated Computer-Aided Design and Drafting [CADD] and Finite Element Analysis [FEA] programs for structural engineers.

Some of these companies offer heat transfer packages which include both steady state and transient analyses. Models of heat transfer analysis include convection, radiation, conduction, phase change, etc. Some software uses 3-dimensional finite difference capacitance-conductance network structures for modeling heat transfer. Solution of the Navier-Stokes equation for natural convection is within the capabilities of some of these software.

All the products present the results of the thermal analysis as 3-dimensional models with color isotherms of heat flux or temperature. CAE packages that include the capabilities described above include ALGOR, NISA II,*m*TAB, FESDEC, SAP90, ANSYS, INERTIA, FIDAP and SCADA.

Modeling a building using CAE directly links the geometric definition of a building to the numerical heat transfer methods. For most of these packages, the numerical methods are defined and not modifiable. This can limit the building applications that can be modeled using CAE.

3. ADVANCED MODELING TECHNIQUES FOR BUILDING SIMULATION

This section will summarize "simulation environment" research efforts and describe the advantages of this approach to building modeling. In addition, the Neutral Model Format and its capabilities will be described.

In 1985 a number of European and North American research organizations considered the future of building energy modeling. IBPSA was formed as an outgrowth of this meeting.

To overcome these historical difficulties described in Section 1, model developers have been investigating new methods of structuring simulation programs. Out of this has emerged the idea of object-oriented simulation environments in which models of arbitrary complexity can be built by linking together calculation objects.

"Simulation environments are under development in the following countries:

- The USA at LBL Simulation Research Group with the US Energy Kernel System (US EKS)
- Sweden at Swedish Institute of Applied Mathematics with IDA
- UK at Energy Simulation Research Unit, University of Strathclyde with the UK Energy Kernel System (UK EKS)
- France at ALMETH with ZOOM and at Electricité de France with CLIM2000
- An NMF-based component library for fire systems at SINTEF Applied Thermodynamics Norway

Although the structures of these systems are quite different, they share a number of common features:

- A processor links calculation objects together to form simulation models.
- According to the standard object-oriented programming paradigm, the methods and data associated with a calculation object are encapsulated; i.e, they are internal to the object and cannot, in general, be altered by other objects.
- Classes of objects can be defined, then instantiated to create particular instances of an object for use in a simulation model.
- Small objects can be assembled in a hierarchical fashion into larger objects (macro-objects or submodels).
- Objects and macro-objects can be stored in a library.

Such simulation environments provide several important advantages relative to traditional methods of program development.

- Depending on the objects selected and how they are linked together, a broad spectrum of models can be assembled, ranging from simplified methods appropriate to early design, to detailed methods appropriate to final design.
- Objects can be easily added to a model, and the internal calculations of an object can be modified without "knock-on" effects in the rest of the model. These features make models easy to upgrade and extend.
- Objects can be reused at a later time for building other models.
- Objects can be shared among different simulation environments if they are expressed in a standard form, then translated for use in a particular environment. To accomplish this a "Neutral Model Format" for calculation objects is being investigated." [1]

"The US Energy Kernel System [EKS] is a modular software environment that will allow the user to generate customized simulation programs to suit their particular analysis needs. EKS is intended to be an efficient way of creating models that can be used in a "stand-alone" fashion or integrated into multi-purpose environments such as CAD systems, expert systems or energy management systems. Alternately, the simulation environment itself could be embedded in computer-aided building design systems." [2]

"Neutral model format [NMF] is an implementation-independent, machine-readable format for the exact description of models of general, modular simulation programs for dynamical processes. The format has been developed by ITM, the Swedish Institute of Applied Mathematics, as a tool for the implementation of models in IDA, a dynamic simulation program. NMF is also used in connection with the US EKS, at LBL. The format is intended for the definition of both continuous and partly-continuous systems and has properties that make it flexible and useful in many circumstances. Two examples are worth mentioning. First, the model interfaces [links] make it easy to connect models. A model interface can consist of several variables, for instance, a set of variables in a fluid flow. Second, is the use of arrays, which enable both the number of discretization elements and the number of interfaces in a model to be varied.

In IDA and the US EKS, the equations are described in an arbitrary form without consideration of the variables' role as input or output. Since the simulation program decides how to solve the equations, the models can be connected in arbitrary order without attending to the role of each variable." [3]

Central to most of these simulation environments, computational support is provided by a generalized solver class which encapsulates a spectrum of analytical, numerical or statistical solution methods to be used in the process of model building. Some methods use a time-nesting method similar to ordinary nesting, enabling one to design simulations where various time steps are used at the various levels of the cluster tree.

The modeling research differs from the projects underway in the Architectural, Engineering and Construction industry [AEC]. It concentrates on the internal aspects of building simulation, the structure of the submodels, and the building of a model. The AEC efforts have concentrated on standardization of input and output, to and from existing models. The AEC efforts are discussed in the next section.

4. TRENDS IN HVAC/ENERGY ENGINEERING SYSTEMS DEVELOPMENT

This section describes software development for the HVAC/Energy design of buildings. This section will summarize research and/or development efforts in the following areas: integrating HVAC/Energy design with Computer-Aided Design Drafting [CADD], developing object oriented data structures for HVAC/Energy engineering, existing product databases and developing standards for building products.

4.1 HVAC/ENERGY ENGINEERING INTERFACE WITH CADD

The motivation to link CADD and engineering comes from two directions. CADD-oriented companies are developing engineering applications, and engineering software companies want links to and from CADD.

For the larger CADD companies, the AEC industry is one of many industries they are trying to accommodate. HVAC/Energy is a

small part of the AEC market. These CADD companies are likely to consider HVAC in the context of the entire AEC market. These software developers include the IBM and Skidmore Owings Merrill Project, ARRIS and Schoonie Engineering, AUTOCAD and its third party developers most notably ASG, and Intergraph.

From the other direction, companies that develop HVAC/Energy design software such as Trane, Carrier, APEC (ASG and SuperDuct) and Elite have established links to CADD companies like AUTOCAD. For the most part, the links are developed through 3rd party developers like ASG and DCA. The 3rd party developers hard-wire the input/output file format of the duct and piping design software programs to/from the CADD software.

The following commercial, CADD-Energy products are known to be available or in development at this time. Carrier's open format will enable ARRIS and Autocad software to link to the Carrier HAP software. Intergraph is developing a CADD link to BLAST. DCA and Elite are developing a CAD link to EasyDOE. Berkeley Solar Group has been developing their own CADD front end for CALPAS. Public Works Canada has a CADD interface for BESA.

Research projects are underway to extend the CADD-Energy engineering link particularly for the purpose of schematic design. In general this work is being conducted at the architecture departments of major universities including Carnegie Mellon University, New Jersey Institute of Technology, Texas A&M, University of Oregon, MIT, Delft University of Technology - The Netherlands, and Lawrence Berkeley Laboratories.

4.2 HVAC/ENERGY ENGINEERING DATABASE DEVELOPMENTS

The development of object oriented data structures for HVAC/Energy engineering will have a longer term, broader range impact on the future of engineering software than the CADD-engineering links. By establishing the data requirements and standardizing the input and output to the major models, software from many sources could be used in an individual's design support environment. Data requirements and database development efforts are underway at APEC with their CABDS project, and the Commission of European Communities with the COMBINE project. Both projects will use existing calculation procedures, at least in their initial phases.

A discussion of the redesign of calculation routines and approaches was considered above in the section entitled "Advanced Modeling Techniques For Building Simulation".

4.3 EXISTING BUILDING PRODUCT DATABASES

To have a building model that is representative of an actual building, the performance of the actual products that will be installed should be considered. This section will compare current approaches to accessing product data.

Product data and HVAC/Energy design are interdependent. Information about product data is required to complete an HVAC/Energy design and, conversely, design information is required in order to select a product.

What follows is a description of three approaches to accessing product information.

First, the manufacturer's selection program is an approach that allows the manufacturer to control the distribution and updating of his information, and control the way the information is presented. Selection programs are available for CADD software in the form of CADD libraries, and engineering analysis in the form of selection programs.

Companies such as Architectural Synthesis and Vertex develop CADD libraries for manufacturers. There are many manufacturer specific selection programs available including those that select pumps, ventilators, windows, coils, heat pumps, packaged systems, electric generators, roofing, plumbing, air handlers, fans, drives, filters, heat transfer fluids, interior finishes, etc. These programs are either developed by the manufacturer in-house or by electronic catalog companies such as Cornerstones-Wright.

Second, the electronic directory approach represents all the products of a given UCI or CSI category. There are two formats for this presentation. One is a fixed format; the same type of information is stored for all products of a category and searches can be performed across all products in a category. The "yellow pages" format is a free form presentation where the manufacturer decides what to present. Thus far, I have presented these as two distinct formats. In actuality, the available software

products have different mixes of the two formats. Companies that currently market software product directories include Electronic Sweet, ECLAT and AMVI-Lund, Sweden.

Finally, certification organizations like ARI and GAMA have product test results available in magnetic form. In the case of ARI, they collect and store more data than is available to the public. DOE test methods involve establishing intermediate results that are combined with calculation procedures to arrive at "average" results which are then reported. If the intermediate test data were reported, HVAC/Energy software could establish the "actual" performance at arbitrary conditions. Eventually, test procedures will need to be changed or expanded to represent performance over a range of conditions instead of only at a single rated condition.

4.4 DEVELOPING STANDARDS FOR BUILDING PRODUCTS

Without a standard that will apply to all the industries involved in a building project, the ability to receive and transmit data related to the HVAC/Energy design of a building will be limited. A comprehensive standard should include manufacturers during production, architects and engineers during design, and fabricators and builders during construction.

The STEP standard has a broad based scope but lacks the definition of data models required for HVAC/Energy design. This product data sharing standard deals with the semantics (meaning or model of product data), as well as the syntax (structure or format).

Application protocols establish the conceptual model in a specific context or application. Through the efforts of the STEP standard groups including NIST, and the database efforts of the organizations in sections 3, 4.2 and 4.3, building product application protocols will be developed. The first of these is the 3D piping IGES application protocol. It supports the exchange of piping product data between the detailed design stage and the fabrication stage of construction.

5. CONCLUSION

The sharing of information between building researchers, simulation researchers, engineering design software developers and product manufacturers is important for building software development to make its next evolutionary jump. IBPSA is helping to promote this information sharing with their newsletter and conferences.

6. REFERENCES

1. Frederick Winkelmann and Godfried Augenbroe. "Integration of Simulation Into The Building Design Process", Building Simulation '91, IBPSA conference, Nice, France, August, 1991.
2. Lawrence Berkeley Laboratory, "Building Energy Systems Program 1989 Annual Report", Simulation Research Group Program Summary.
3. Kjell Kolsaker at SINTEF Applied Thermodynamics, Norway. "An NMF-Based Component Library For Dynamic Simulation Of Fire Water Distribution Systems In Buildings".

INDIANAPOLIS MEETING MINUTES

IBPSA Board of Directors Meeting
Saturday, June 22, 1991
Indianapolis, Indiana, USA

MINUTES

1. **Call to Order**
The meeting was called to order by Seth at 6:50 p.m.

2. **Roll Call**
A quorum was determined by count. An attendance sheet was passed around for signatures.

3. **Approval of Agenda**
The Agenda mailed by M. Witte in the May 1991 Newsletter was approved as presented.

4. **Approval of Minutes**
The Minutes of the New York meeting were approved on a motion by Yuill and seconded by Alereza.

5. **Announcements**
There will be a Board Meeting in Nice as well as a General Meeting to discuss the "International Dimension" during the BS '91 Conference. It was suggested that the

Board Meeting take place during Lunch on Wednesday the 21st August 1991. The General Meeting could take place on Thursday afternoon. The announcements for these meetings should be made on the opening day of the Conference.

6. Old Business

6.1. Elect a new IBPSA Secretary
Three names were proposed to fill the position of the Secretary vacated by Dwight Beranek. Alereza moved that Seth contact (1) Ed Knipe, (2) Fred Winkelmann, and (3) Jeff Haberl in that order to discuss their willingness to accept the position, and report back results to the Board in Nice.

6.2. BS '91 Steering Committee Report
It was reported that funds have been received from EPRI, GRI, BPA and CERL. DOE is in the process of approvals and funds should be forthcoming soon. Gardner will follow the situation closely. A Financial Report prepared by Van de Perre and faxed to Seth was discussed. It was noted that some 128 potential conference attendees have already registered. With the contributions already received both from North America and Europe the Conference is projecting a healthy profit. Thus participants pay mainly for direct cost related to the conference attendance than to contribute towards the conference profit.

6.3. RP-90/1 - Amistadi Contract
A review committee consisting of Lawrie and Yuill was appointed to assess Amistadi work against the terms of reference of the contract, and to recommend to the Board on the final payment. It was suggested that the paper be published in the Newsletter, and a copy of the report sent to all paid members. Also, that a copy of the report be handed out to all BS '91 participants. A motion to release $500.00 of the $1,000.00 outstanding to Amistadi was unanimously supported.

6.4. Awards Guidelines
A motion to adopt awards guidelines as published in New York Minutes was approved (Yuill/Ayres).

6.5. Financial Report
Alereza distributed a Summary of Financial Status (attached). On a motion by Ayres and seconded by Yuill the report was accepted. It was decided that $6,800.00 be transferred to BS '91, as previously committed.

6.6. Membership Drive
Was deferred to General Meeting.

6.7. Executive Secretary Matters
This item was also deferred to the General Meeting.

7. New Business

7.1. Nominations for Board of Directors
A nominating committee consisting of Yuill, Gardner, and Mitchell was appointed. The committee will put forward a list of candidates for Board of Directors positions before the next meeting of IBPSA.

8. Adjournment
The BOD meeting adjourned at 8:30 p.m.

IBPSA General Meeting
Saturday, June 22, 1991
Indianapolis, Indiana, USA

MINUTES

1. Call to Order
The meeting was called to order by Seth at 8:30 p.m.

2. Roll Call
A quorum was determined by count. An attendance sheet was passed around for signatures by Witte, substituting as secretary.

3. Approval of Agenda
The Agenda with the addition of two items 6.6 and 6.7 carried over from the BOD meeting was accepted.

4. Approval of New York Minutes
On a motion by Ayres and seconded by Gardner the minutes were approved.

5. Announcements
There will be a Board Meeting in Nice as well as a General Meeting to discuss the "International Dimension" during the BS '91 Conference. It was suggested that the Board Meeting take place during Lunch

on Wednesday the 21st August 1991. The General Meeting could take place on Thursday afternoon. Announcements for these meetings should be made on the opening day of the Conference.

6. Committee Reports

6.1. Membership

Alereza informed the membership that there were 40 paid members for 1991 out of a potential 100 renewals. Of the 40, 24 were paid up in 1990 and 16 new have paid through BS '91. A discussion on how to increase membership resulted in the following suggestions:

- run application continually in *ibpsaNEWS*.
- make available list of members to potential members for networking possibilities.
- distribute and exchange newsletters between North America and Europe.
- organize an electronic bulletin board for upcoming events, job openings, etc.
- assemble and distribute a catalogue of research activities of interest to general membership.
- put together an IBPSA products proposal for sponsorship by external organizations.

6.2. Finance

Summary of Financial Status attached.

6.3. Program (BS '91)

Mitchell gave a brief status report as follows:

- 68 authors have been selected from over 200 authors and co-authors from more than 100 different institutions.
- Final conference program will be announced shortly with the titles of sessions, chairpersons, and authors.
- Some 128 potential conference attendees have already registered. Conference organizers are expecting approximately 150-175 registrants at the conference.

6.4. Newsletter and Publications

Newsletter proposal from Amistadi represents a good outline, but for a proposed budget of $60-100K the Association should seek other interested parties to compete. In the meantime arrangements currently in place with Alereza and (to be rotated to Barnaby) should continue at a modest level of involvement.

Seth commended Witte for sharing a lion share of the burden in putting together the Newsletter and ensuring its distribution to members.

6.5. Research

Lawrie distributed a copy of the research survey results document to members. Analysis of the results show that the survey tallies do not present a clear picture for each topic area. Nonetheless, the survey helped gain some insight into the research priorities. It was decided to publish results of the survey in the Newsletter and to make copies of the report available to IBPSA membership.

RP-90/1 - BOD's disposition on Amistadi contract agreed to at an earlier BOD Meeting was repeated.

7. Old Business

7.1. Executive Secretary Matters

It was proposed that a small group of members led by Seth meet on Sunday at Lunch to prepare a terms of reference (i.e., duties and work packages) for the Executive Secretary, for consideration by the General Membership. In the meantime, arrangements discussed in item 6.4 above shall prevail.

7.2. International Dimension

Seth presented highlights of Sowell's article in the May 1991 Newsletter to start the discussion. Several views were expressed as to the possible structure of an emerging IBPSA organization taking into consideration the international dimension. The U.K. representative pointed out that BEPAC is not limited to Building Performance Simulation activities, that its mandate includes environmental considerations as well. Thus BEPAC mirrors more closely to ASHRAE than to IBPSA. Judging from SCS' mandate, it was observed that SCS' mandate is too broad and lacks a clear focus. That its strength lies in organizing conferences, therefore, IBPSA should

forge a strategic alliance with SCS as opposed to being subsumed under its charter. It was generally agreed that IBPSA is a highly focussed society and it has a great deal to offer in the area of building performance.

A motion suggested in Van de Perre's letter of June 21, 1991 was discussed and a final resolution passed as follows:

"That Rick Van de Perre together with Ed Sowell prepare a Discussion Paper outlining possible restructuring of the current IBPSA organization taking into consideration the international dimension and its future survival as a viable organization".

8. New Business

8.1. Meeting

The next IBPSA General Meeting will be held in Nice on August 22nd, 1991. Time and Place of the meeting will be announced at the BS '91 Conference.

9. Adjournment

There being no further business the meeting was adjourned at 9:45 p.m.

IBPSA FINANCIAL REPORT

As of May 17, 1991

Starting Balance

As of January 19, 1990 ..... US$36,105.63

Revenue

Membership Dues	2,325.00
BS '91 Sponsorship	28,000.00
Sale of Proceedings	90.00
Interest (5/17/91)	283.79
Interest (CD Accounts)	342.95
Total Income	US$31,041.74

Expenses

Membership Brochure (printing)	336.34
Brochure Design/Dues Mailings	500.00
Pat Voveris (Brochure mailing)	126.00
BS '91	31,131.00
Wire Transfer Fee	18.00
Total Expenses	US$32,111.34

Final Balance

As of December 19, 1990 ..... US$35,036.03

Available Funds

Money Market	US$13,182.59
Bank CD	10,917.56
Merrill Lynch CD	10,935.88
Total Funds	US$35,036.03

Received from BS '91 Sponsorships

Gas Research Institute	US$10,000.00
Bonneville Power Administration	3,000.00
Electric Power Research Institute	20,000.00
CERL	5,000.00
IBPSA Contribution	10,000.00
Total	US$48,000.00

PUBLICATIONS AVAILABLE

Building Simulation '89 Proceedings

Proceedings from Building Simulation '89 are available from IBPSA at US$75.00 per copy.

Shipping charges are as follows:

First class, U.S. & Canada	US$3.00 each
Air mail, Canada & Mexico	5.00 each
Overseas, surface mail	3.00 each
Overseas, air mail	15.00 each

Send orders to:

IBPSA
c/o Edward F. Sowell
Department of Computer Science
California State University, Fullerton
Fullerton, CA 92634

MEMBER NEWS

Please submit information regarding promotions, moves, or other personal news of interest to the IBPSA membership. Please send to the address listed at the end of this newsletter; indicate clearly if any information should not be published.

New Address

Carol Gardner
TRA
215 Columbia
Seattle, Washington 98103
U.S.A

Phone: 206-224-4719
FAX: 206-621-8782

UPCOMING CONFERENCES AND MEETINGS

Building Simulation '91
August 20-22, 1991
Nice/Sophia-Antipolis, France

Sponsored by IBPSA

For more information, contact:
IBPSA-BS '91 Conference Secretariat
SCSI
c/o Philippe GERIL
Coupure Links 653
B-9000 Ghent
BELGIUM
Telephone and fax: 32 91 23.49.41
E-mail: SCSI@BGERUG51.BITNET

IBPSA General Meeting
August 22, 1991
6:30 p.m.
Nice/Sophia-Antipolis, France

ASHRAE Winter Meeting
January 25-29, 1992
Anaheim, California, USA

For more information, contact:
ASHRAE
1791 Tullie Circle, NE
Atlanta, GA 30329-2305
USA
Phone: 404-636-8499
FAX: 404-321-5478

IBPSA General Meeting
January 25, 1992
Evening, Specific time to be announced
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