



Tube Layout Feature in IST 2.0

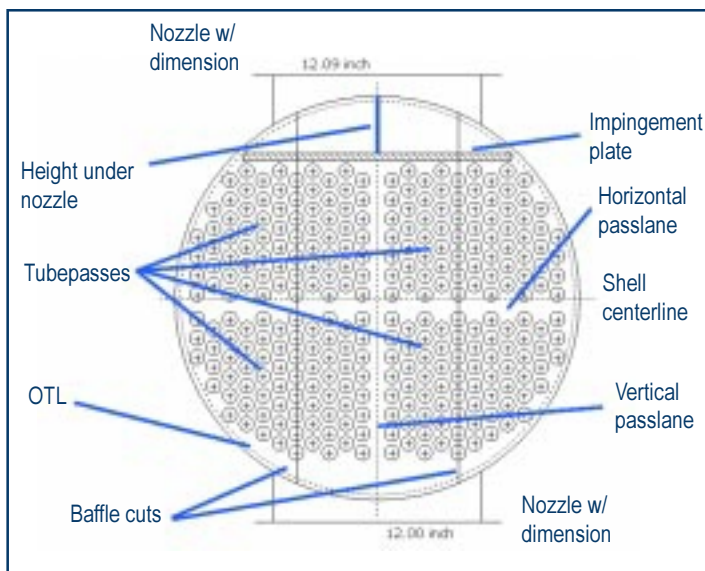
The tube layout capabilities in IST 2.0 will include features to simplify the display and manipulation of the tube bundle in a shell-and-tube heat exchanger.

Minimal input is required to generate the tube layout, yet the interface provides sufficient control to allow specific input. Each input field supports built-in unit conversion so that entries can be made in unit systems other than the globally selected unit set.

In addition to generating the tube layout, IST automatically calculates the recommended number of seal strips and tierods. The calculation algorithm also sets the height under the inlet nozzle based on the flow rate on the shell side.

Tube layout graphical interface

The tube layout graphical user interface provides viewing and editing capabilities on the tube bundle model. The figure below illustrates a typical tube layout with annotations to the drawing features.



Tube Layout

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CC Established in Houston

Congratulations to the seventh HTRI Communication Committee (CC), established in Houston on September 14, 1999! Ken Jones organized the meeting, which was hosted by Kellogg Brown & Root. Fernando J. Aguirre, Vice President, represented HTRI at the first meeting.

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CC News

CC-Houston, TX (USA)

The second meeting of the newly established CC-Houston is scheduled for January 11, 2000 at S & B Engineers & Constructors, Ltd. The technical topic planned for this meeting is a discussion of the recently published TEMA 8th Edition. For additional information, contact K. A. Jones at +1-713-753-3878 (phone), +1-713-753-2535 (fax), or ken.jones@halliburton.com (e-mail).

CC-Japan

Hitoshi Miyamoto, Ishikawajima-Harima Heavy Industries Co., Ltd. was elected chair of CC-Japan at their October 1999 meeting, replacing Hirohisa Uozu who recently retired from Toyo Engineering Corporation. A vice chair of the committee will be elected at the next meeting.

CC-Singapore

This committee, chaired by Robert Lee, held a meeting during the 1999 HTRI Asian Meeting in Singapore. This allowed participation by visiting member company representatives from Australia and China plus HTRI staff.

CC Established in Houston

(Continued from page 1)

The meeting was attended by eleven representatives from the following member companies:



ABB Lummus Global, Inc.
BP Amoco Chemicals
Brown & Root Energy Services
E.I. du Pont de Nemours &
Co., Inc.
Engineers and Fabricators, Co.
Jacobs Engineering Group Inc.

Kellogg Brown & Root
S & B Engineers and
Constructors, Ltd.
Smithco Engineering Inc.
Sterling Chemicals, Inc.
Stone & Webster Engineering
Corporation

Kenneth A. Jones, Kellogg Brown & Root, was elected chair, and Allen C. Miller, ABB Lummus Global, Inc., vice chair of the committee.

Meeting Evaluations Provide Useful Comments

Evaluations are a common component of workshops and meetings; HTRI, too, has requested participant completion of evaluation forms for many years. As of the July 1999 Annual Meeting of Stockholders, our forms were revised and a renewed effort was made to encourage participants to complete them. As a result, we received a number of very useful comments and suggestions. We want to share some of the actions we are taking as a result of your comments.

- 1) Meeting book sections and presentations will have tabbed sections to make it easier to follow along with the sessions.
- 2) Round table luncheon sessions will be continued; these received high ratings.
- 3) A list of commonly used acronyms will be provided in the meeting books.
- 4) SI units will be included in all presentations.
- 5) New presentation guidelines will be developed to improve graphic clarity and readability.
- 6) Short, informative sessions will be held, when possible, to offer members assistance with specific program features, to allow in-depth discussion on topics, etc. This is a result of the very positive reaction to the on-line help sessions offered at the Annual Meeting of Stockholders.
- 7) A “first-time attendee” session will be held when there are a number of persons attending their first meeting. This will help these persons become familiar with the meeting format, allow them to ask questions in a small and comfortable setting, and provide an opportunity for them to meet HTRI staff and active volunteers.
- 8) Sessions to allow member presentations and/or poster sessions are being considered. Space and time requirements are the challenges to these activities.

We appreciate the time you devoted to making thoughtful and candid comments. As you can see, you have spoken and we have listened. Please continue to give us your feedback; we want meetings and workshops to be productive use of your time, valuable personally and professionally, and enjoyable.

New Area Code

Our area code “409”
will change to

“979”

effective
February 1, 2000.

The new numbers will be:

Phone: +1-979-260-6200
Fax: +1-979-260-6249
Support: +1-979-260-4874

HTRI International Meetings

Como, Italy (September 20-24, 1999)

The events offered at this year's European meeting, held at the Grand Hotel in Como, Italy, September 20-24, 1999, attracted fifty-six registrants. Corporate and technical presentations summarizing reports from the 1999 Annual Meeting of Stockholders were made by C. D. Beyer, F. J. Aguirre, D. L. Johnson, and R. S. Kistler. The popular IST and ACE workshops were conducted by R. S. Kistler and D. L. Johnson, and attended by 31 and 26 persons respectively. John R. Thome was the instructor of the EHT workshop.

Chiba, Japan (October 25-29, 1999)

The 1999 Asian meetings and workshops were held in Chiba, Japan, and Singapore. Twenty-six persons registered for the events hosted by Toyo Engineering Corporation in Chiba, Japan. Corporate presentations were made by C. D. Beyer and F. J. Aguirre. D. L. Johnson and R. S. Kistler made technical presentations and conducted the well attended IST and ACE workshops.

Special thanks and appreciation for the successful organization and hosting of the meeting by Toyo Engineering Corporation are due to Teruhiro Kojima and his colleagues.

The CC-Japan, chaired by Hitoshi Miyamoto, met after the HTRI meeting in order to take advantage of the presence of HTRI staff.

Singapore (November 1-5, 1999)

For the third time this decade, HTRI staff met with its customers in Singapore. The meeting and workshops were held at the Royal Crowne Plaza Singapore and attended by a total of 25 member representatives. C. D. Beyer, F. J. Aguirre, R. S. Kistler, and D. L. Johnson presented the identical schedule as in Japan. The staff were especially pleased with the good response and high interest expressed by the attendees of the IST workshop.

As in Japan, the CC-Singapore, chaired by Robert Lee, met after the HTRI meeting in order to take advantage of the presence of HTRI staff.

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the Web!**

www.HTRI-Net.com

HTRI-NET™

Staff News

We are very pleased to welcome three new staff members to the HTRI team. The new staff, who joined us during 1999, are:

- **Fred Hendrix, Software Engineer**
Bachelor of Science in Mechanical Engineering from The University of Texas. Previously employed by the Paulin Research Group, The Woodlands, Texas.
- **Shawn McGee, Associate Software Engineer**
Graduate of Texas A&M University with a Bachelor of Science in Chemical Engineering.
- **Spelile Rivas, Administrative Assistant**
Graduate of Texas A&M University with a Bachelor of Arts degree in English.



Left to right:
S. McGee, S. Rivas, F. Hendrix



Holiday Schedule

HTRI will be closed from December 24, 1999 through January 2, 2000. During this time, the technical support e-mail, telephone, and fax will be monitored for urgent messages.

We will resume our normal business hours on Monday, January 3, 2000.

From the HTRI staff,

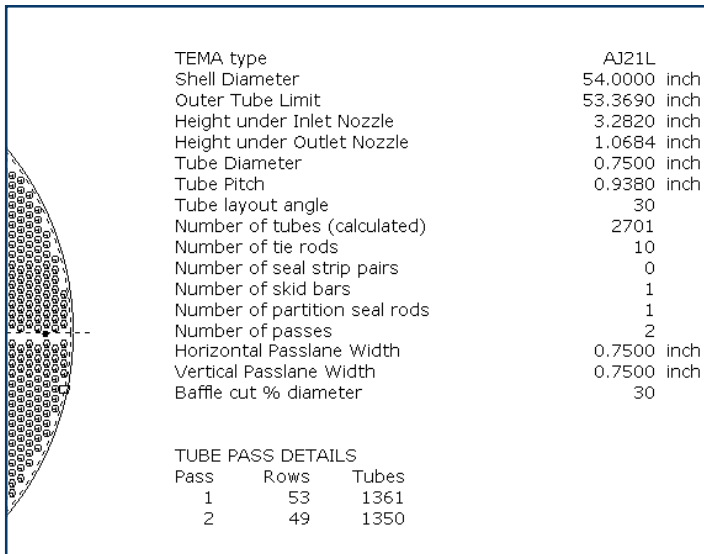
Happy Holidays!

Tube Layout Feature in IST 2.0

(Continued from page 1)

The tube bundle can be edited to add or remove tierods, impingement rods, and dummy tubes. Tierods, partition seal rods, skid bars and seal strips can be added or removed outside the tube bundle. Seal strips can be oriented vertically, horizontally or radially.

Several key parameters are displayed in the tubesheet legend that summarize the layout. The figure below illustrates a typical example of the tubesheet legend.



Typical Tube Layout Legend

The tube legend tracks information interactively as the items are added and removed from the tube bundle model.

Connectivity to other software

HTRI recognizes the need to interface with other software to facilitate the workflow process. The tube layout program provides interface mechanisms to facilitate connectivity with non-HTRI programs. One of the primary interfaces for data transfer is the enhanced metafile. Enhanced metafiles are the natural interface standard supported on the Microsoft 32-bit Windows platforms. The tube layout drawing can be exported to the clipboard or to a file and then pasted or inserted into an external program such as Microsoft Word®. Note that each drawing entity is an independent construct in the metafile so that it can be modified after the transfer. For example, individual tubes can be deleted or modified after the transfer. Similarly, the tube layout program supports transfers through Autocad® DXF format files.

In summary, the tube layout module in IST 2.0 provides many new features to assist in laying out the bundle. The module is integrated into the IST program architecture while remaining an independent component that can easily be upgraded. HTRI has also provided connectivity to other software through enhanced metafiles and Autocad® DXF files.

Pass it on!

If you've finished reading this copy of *The Exchanger*, please pass it on to a friend or a co-worker. If you would like to be added to *The Exchanger* mailing list, contact Jo Anne Smith at +1-409-260-6206 (telephone), +1-409-260-6249 (fax), or Newsletter@HTRI.net (e-mail).

2000 TRAINING SCHEDULE

FEBRUARY

Introduction to Process
Heat Exchangers
IST 2.0
ACE 3.1
Houston, Texas, USA

MARCH

Design of Falling Film Evaporators
Atlanta, Georgia, USA

APRIL

IST 2.0
United Kingdom

JULY/AUGUST

Vibration Analysis
ACE 4.0 Preview
FH 2.0 Preview
IST 2.0 Overview
Pasadena, California, USA

OCTOBER

ACE 4.0 Overview
FH 2.0 Overview
IST 2.0
Heidelberg, Germany

NOVEMBER

ACE 4.0 Overview
FH 2.0 Overview
IST 2.0
Kobe, Japan

Look for details in the coming months.



Heat Transfer Research, Inc.

Training Week

Courses Offered:

- ◆ Introduction to Process Heat Exchangers
Instructor: Cecil C. Gentry
- ◆ IST 2.0
Instructor: Joseph W. Holmes
- ◆ ACE 3.1
Instructor: R. Stanley Kistler

February 28 - March 3, 2000

Hyatt Regency Houston Airport
Houston, Texas
USA

Registration Deadline

February 7, 2000

HOUSTON

Watch your mail for details arriving soon!

Training for ENPPI

HTRI's first workshop in Egypt was held in Cairo on September 26-30 at the offices of engineering contractor ENPPI. Previously associated with the C. F. Braun Company, ENPPI became an independent company in 1987, and has been an HTRI member for about a year and a half. Joseph W. Palen conducted the training.

A recent emphasis in Egypt on industrialization has prompted companies such as ENPPI to upgrade their calculation tools in preparation for increased activity. HTRI provided detailed instructions in use of the IST and ACE software, as well as more limited assistance with CST, RKH, RTF, ST and FH.



ENPPI Training Attendees

AIChE Short Course

Design of Falling Film Evaporators

Instructors: Joseph W. Palen and David L. Johnson

Vertical falling film evaporators have been used for many years to concentrate aqueous solutions, as required for example in the pulp and paper industry. More recently they are finding many applications in the hydrocarbon processing industries for vacuum distillation and vaporization of heat sensitive fluids.

This course discusses recent advances in design methods and shows how these approaches may be applied to practical design of industrial equipment.

Topics covered will be

- basic geometries
- flow distribution
- critical heat flux
- minimum wetting rates
- pressure drop
- multicomponent diffusion effects

Examples of industrial design using state-of-the-art computer technology also will be discussed.

*AIChE Spring National Meeting
Atlanta, Georgia, USA*

Saturday, March 4, 2000 (1:00 – 5:00 PM)

Technical Support Available

E-mail: Support@HTRI.net

Use e-mail, if possible, for complex cases

Fax: +1-409-260-6249

Use "Fine" resolution to ensure clarity

Telephone: +1-409-260-HTRI (4874)

Monday - Thursday (8:30 am - 4:30 pm CST)

Friday (8:30 am - 12:30 pm CST)

Enhanced Heat Transfer: Boiling, Condensation, and Two-Phase Flows

**Short Course
February 3-5, 2000
Dallas, Texas, USA**

The 10th edition of this short course will be offered by Prof. John R. Thome. It is a comprehensive course providing detailed lectures on heat transfer augmentation theory and design principles. Users of the EHT software and others will greatly benefit from the indepth lectures on laminar flow augmentation, enhanced boiling, enhanced condensation, etc. and presentation of numerous videos of enhancement and two-phase phenomena.

For more information or to register, contact HTRI. The cost of this two and one-half day course is \$895.

Topics covered include

- enhanced condensation and boiling heat transfer
- two-phase flows, flow patterns and pressure drop
- boiling and condensation of mixtures
- oil effects on evaporator performance
- augmentation of laminar intube flows
- boiling and condensation in plate exchangers
- heat transfer to air coils

For a brochure and more details about the course, contact Fernando J. Aguirre at HTRI.

New Research Reports

HTRI has published four (4) new research reports since the start of fiscal year 2000. We are providing a brief synopsis of these reports that cover tubeside and shellside falling film evaporation, phase change in plate heat exchangers, and flow-induced tube vibration with two-phase flow.

BT-16 Falling Film Evaporation of Ultra-Viscous Fluids

The tubeside falling film evaporation research was completed with the addition of data covering viscosities up to 1200 mPa s (1200 cP). These data were used to improve the design methods for falling film evaporators with Prandtl numbers up to 1.3 (10^4) and Schmidt numbers up to 1.8 (10^7). As a result of this research effort, IST 2.0 will have full capability to design vertical tubeside falling film evaporators.

BX-9 Falling Film Evaporation on Horizontal Tubes and Tube Bundles

Falling film evaporation on the outside of horizontal single tubes and tube bundles is reviewed. State-of-the-art heat transfer design methods are reviewed showing the relative benefits of horizontal falling film evaporators compared with vertical intube units and flooded evaporators. Recent research on plain and enhanced tubes is emphasized, and recommendations for future research are presented.

PHE-6 A Review of Present Methods for Predicting Phase-Change Heat Transfer and Pressure Drop in Plate Heat Exchangers

Published studies on two-phase flow, boiling, and condensation in plate heat exchangers are reviewed. Available predictive methods for two-phase heat transfer and pressure drop are summarized. Recommendations for further research to improve rating and design methods are presented.

STV-9 Review of Two-Phase Flow-Induced Vibration in Heat Exchangers

This report presents a review of flow-induced vibration in tube bundles under two-phase flow conditions. Vibration mechanisms and dynamic forces acting on vibrating tubes are examined, and the state of the art is summarized. Recommendations for future research are presented for more accurate characterization of two-phase flow-induced vibration in shell-and-tube heat exchangers.

HTC Software

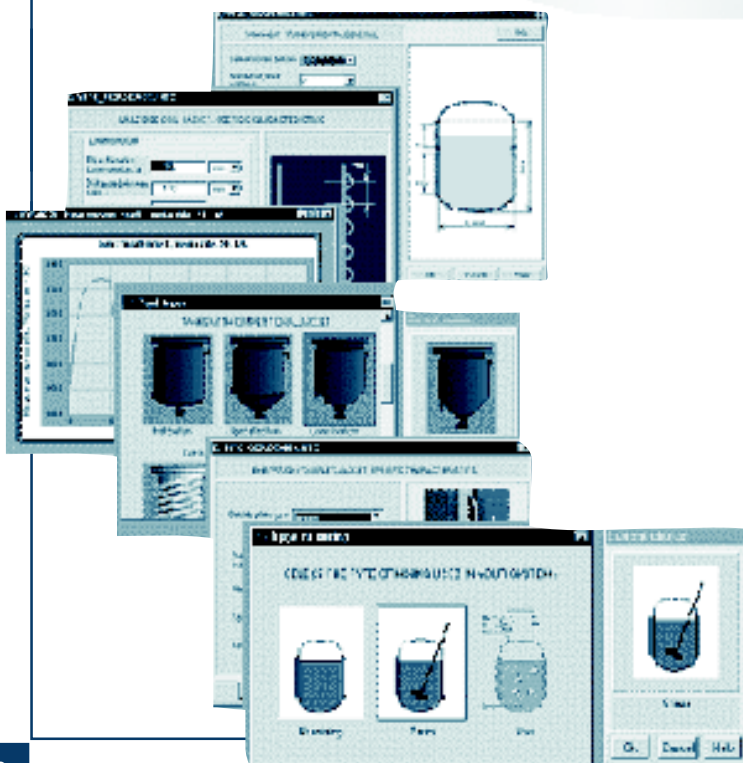
Developed by HTC Ltd.

brings smart models within everyone's reach!

HTRI has an alliance with HTC Ltd. (Jerusalem, Israel) and Performance Systems (Houston, Texas, USA) to market and license HTC software, providing a discount for HTRI members. This software models heat transfer in jacketed vessels.

Any:

- Jacket
- Vessel
- Insulation Type
- Heating Agent
- Cooling Agent
- Mixing
- Process



For information, contact:

Heat Transfer Research, Inc.

Phone: +1-409-260-6206

Fax: +1-409-260-6249

E-mail: HTCsoftware@HTRI.net



Membership Update

Information current as of November 30, 1999

New Members

Cembell Industries, Inc.
Chalmette, Louisiana, USA

Dynatherm
Bromsgrove, Worcestershire, United Kingdom

Kvaerner Process (India) Ltd.
Bangalore, India

Melter, S.A. de C.V.
Apodaca, Nuevo Leon, Mexico

Techint - Compagnia Tecnica Internazionale S.p.A.
Milan, Italy

New Participating Affiliates

ABB Alstom Power
Milan, Italy

Subscription/Address Change

To start your free subscription to *The Exchanger*, or change the address on your current subscription, please fill out this form and mail or fax it to HTRI.

Name _____

Company _____

Address _____

Phone _____

Fax _____

E-mail _____

Member Renewals

Ambassador Heat Transfer Company
Cincinnati, Ohio, USA

APEMA - Aparelhos, Peças e Máquinas Industriais Ltda.
São Paulo, Brazil

Compañía Española de Compensadores S.A. – SACOME
Cartagena, Spain

Dunn Heat Exchangers, Inc.
Texas City, Texas, USA

E.N. BAZAN de C.N.M.S.A.
Cartagena, Spain

Energy Exchanger Company
Tulsa, Oklahoma, USA

EQUITHERM
Versailles, France

GEA Energy System (India) Ltd.
Chennai, India

Krueger Engineering and Manufacturing Co., Inc.
Houston, Texas, USA

L&T-Chiyoda Limited
Baroda, Gujarat, India

LG Engineering & Construction Corp.
Seoul, Korea

Sanko Engineering Corporation
Yokohama, Japan

SNAICO Engineering S.p.A.
Cerro Maggiore (MI), Italy

Worley Limited (Brisbane)
Brisbane, Queensland, Australia

Zellweger Luwa AG
Uster, Switzerland

Current Software

ACE	3.1
CST	3.3
FH	1.01
IST	1.2
PHE	1.1
RKH	3.2a
RTF-2	7.21-1.30
ST	5.3
ST Educational	1.0
VIB-0	

Software distributed by HTRI

EHT	1.1
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To order an update for any HTRI computer program,
contact Product Distribution.

Upcoming Events

Training Week - Houston

February 28-March 3, 2000
Hyatt Regency Houston Airport
Houston, Texas, USA

2000 European Meeting

October 23-27, 2000
Der Europäische Hof/Hotel Europa
Heidelberg, Germany

AICHE Short Course

March 4, 2000
Atlanta, Georgia, USA

2000 Asian Meeting

November 2000
Kobe, Japan

ACHEMA 2000

May 22-27, 2000
Thermal Processes
Exhibition Group
Hall 4.1, Stand G17-G18
Frankfurt am Main, Germany

2001 Annual Meeting of Stockholders

July 30-August 3, 2001
The Ritz-Carlton® Pentagon City
Arlington, Virginia, USA

2000 Annual Meeting of Stockholders

July 31-August 4, 2000
The Ritz-Carlton® Huntington
Pasadena, California, USA

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