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**2.      Establish Quorum Requirement**

Voting members M. Chyu, N. Gupte, J. Huber, M. Ohadi, S. Oza, P. Payvar, M. Spatz, P. Thors, J Larson and K. Oza were. Z. Ayub, J. Seyed-Yagoobi and N. Hanna were absent.

**3.      Review/Approve Seattle Meeting Minutes**

After a motion by J. Huber (seconded by P. Thors) the TC voted unanimously to accept the minutes from the previous meeting

**4.      Chairman's Comments**

M. Spatz reported Section 8 as a whole is behind in implementing web site; TC 8.5 does have a website.

While there are still problems, the roster inaccuracies are being corrected. A new database is being implemented.

A CD has replaced the manual for TC chairmen.

The deadline for the Atlanta program is 8/1/00.

The number of work statements approved since the Winter meeting has increased, nearing the budget limit. The approval of additional work statements will be prioritized.

Information is available on Clima 2000.

**5.      Section Head's Comments**

The Section Head, Stan Westhoff presented M. Spatz with a Certificate of Recognition for his service as committee chairman.

**6.      Comments from Liaisons (Handbook, Standards, Journal, Research, Program, TEGA, Technical Services, Refrigeration)**

No liaisons were present.

**7. Handbook Subcommittee Report**

The new Systems and Equipment Handbook has recently been distributed. TC 8.5 had provided input to the revised Condenser and Liquid Cooler Chapters.

**8. Program Subcommittee Report**

M. Ohadi reported the flow visualization seminar planned for this conference was not approved, and is now planned for the winter meeting in Atlanta, along with another Symposium in the "Advances in Thermal and Fluid Flow Characteristics" series and a Seminar on "The use of MEMs in HVAC Systems."

**9. Membership Sub-Committee Report**

S. Oza reported that D. Geary, S. Kondepudi, R. Laks, and F. Scheidemann no longer attend and their names will not be on the next roster published.

**10. Standards Sub-Committee Report**

Standard 22 and Standard 24 are now published.

**11. Journal/Insight Article Subcommittee**

J. Huber reported that the TC 8.5 website is now accessible through the ASHRAE website. He is continuing to add information and requested electronic copies of previous committee meeting minutes, work statements, and research project reports where available. The Research Subcommittee should have a scope statement.

**12. Research Sub-Committee Report**

S. Moeykens reported that the Work Statement on Fouling was approved by the RAC. It will be amended to require 75 sites for the database. R. Webb's recent work included 26 sites which, if the information is compatible could be added to the 75.

The RTAR for the EHD project was disapproved. It may be resubmitted if the TC wishes. P. Payvar has drafted RTAR's for Evaluation of Immiscible/Insoluble Lubricant/Refrigerant Pairs and Evaluation of the Impact of Tube Pitch in Highly Enhanced Surface Tube Bundles.

A discussion of the Research Plan followed. The Research Plan is due August 1. During the discussion J. Judge suggested that a project to investigate Vibration of Tubes in Single Phase Crossflow be considered. The TC selected 3 projects for the research plan as follows:

1. Experimental evaluation of the heat transfer impacts of tube pitch in a highly enhanced surface tube bundle. The TC selected this project by a vote of 10-0-0 on a motion by J. Larson (second by J. Huber).
2. Experimental evaluation of tube vibration in bundles with single-phase crossflow. The TC selected this project by a vote of 6-2-2 on a motion by J. Larson (second by P. Payvar). J. Judge will write the RTAR prior to August 1.
3. Experimental evaluation of the heat transfer impacts of the use of an immiscible and insoluble lubricant/refrigerant pair. The TC selected this project by a vote of 9-0-1 on a motion by M. Spatz (second by J. Huber).

It was noted that the scope of work statements needs to be consistent with that of the RTAR or they will not be approved.

**13. 752-RP: Heat Transfer - Brazed Plate HX's**

A. Fovargue reported that the project had been terminated. The PI will complete a summary report by the end of summer.

**14. 984-TRP: Effects of Inundation and Oil on Condensing R-134a**

J. Huber reported that pure refrigerant data for the 3D tube was complete and smooth tube data was nearly complete. There had been some delays due to multiple problems with the diaphragm pump. A compressor will be used to generate an oil fog for the oil data. Data from the 3D surface tests was presented. The data showed that varying superheat had minimal effect on the heat transfer coefficient. 3 °F superheat will be maintained for the balance of the testing because the system is most stable. The data also showed a definite row affect, however there were some inconsistencies that the investigators will review. The row affect is much less visible in the smooth tube data. A motion by J. Huber (P. Payvar second) to grant an extension through the next TC meeting passed unanimously.

**15. 1089- RP: Flooded Evaporator: Using R-410A and R-507**

S. Moeykens reported that the test facility is nearly complete. Bundle test work will begin in the next few months. A large portion of the shell side refrigerant data will be available for the next meeting of the TC.

**16. New Business**

No new business was presented.

**17. Schedule Next Meeting and Adjourn**

The next meeting will be 4:15 to 6:30 PM, Monday, January 29, 2001, in Atlanta. The meeting was adjourned at 5:56 PM.

ASHRAE TC/TG/TRG ACTIVITIES SHEET

DATE: January 2, 2001

TC/TG/TRG NO.: TC 8.5 TC/TG/TRG TITLE: Liquid-to-Refrigerant Heat Exchangers

CHAIRMAN: J. Huber VICE CHAIRMAN: \_\_\_\_\_ SECRETARY: J. Larson

TC/TG/TRG MEETING SCHEDULE				
Location-Past 12 Months	Date	Location-Planned Next 12 Months	Date	
Seattle	June 1999	Atlanta	Jan 2001	
Dallas	Feb 2000	Cincinnati	June 2001	
Minneapolis	June 2000	Atlantic City	Jan 2002	
TC/TG/TRG SUBCOMMITTEES				
Function	Chairman			
Program	M. Ohadi			
Membership	S. Oza			
Research Monitoring	J. Huber, S. Moeykens			
Research Initiation	S. Moeykens			
Handbook	N. Gupte			
Standards	N. Hanna			
Journal	J. Huber			
RESEARCH PROJECTS-CURRENT				
Project Title	Contractor	Monitoring Comm. Chpt.	Report Made At Meeting	
See Attached				
LONG RANGE RESEARCH PLAN				
Rank	Title	W/S Written	Apprv.	To R&T
1.	See Attached			
2.				
3.				
4.				

(OVER PLEASE)

## RESEARCH PROJECTS - CURRENT

<u>Project Title</u>	<u>Contractor</u>	<u>Monitoring Committee Chairman</u>	<u>Report Made at Meeting</u>
RP-984: Effects of Inundation & Oil on Condensing R134a	Kansas State	J. Huber	Yes
RP-1089: Effect of Oil on Heat Transfer with HFC 410a & HFC 507	Swiss Federal Institute of Tech.	S. Moeykens	Yes

## LONG RANGE RESEARCH PLAN

<u>Rank</u>	<u>Title</u>	<u>W/S Written</u>	<u>Approved</u>	<u>To R &amp; T</u>
	Waterside Fouling Inside Smooth and Augmented Condenser Tubes in Cooling Tower Water Applications	Yes	Yes	Approved
1.	Experimental Evaluation of the Heat Transfer Impacts of Tube Pitch in a Highly Enhanced Surface Tube Bundle	No		
2.	Experimental evaluation of tube vibration in bundles with single-phase crossflow	No		
3.	Experimental Evaluation of the Heat Transfer Impacts of the Use of an Immiscible and Insoluble Lubricant/Refrigerant Pair	No		

HANDBOOK RESPONSIBILITIES					
Year & Volume	Chapter	Title	No.	Deadline	Handbook Subcom Liaison
2004 Systems	Chapter 37:	Liquid Coolers			
2004 Systems	Chapter 35:	Condensers			
STANDARDS ACTIVITIES-List and Describe Subjects					
Standard 22: No current activity					
Standard 24: No current activity					
TECHNICAL PAPERS from Sponsored Research-Title, when presented (past 3 yrs. present & planned)					
TC/TG Sponsored Symposia-Title, when presented (past 3 yrs. present & planned)					
See Attached					
TC/TG Sponsored Seminars-Title when present (past 3 yrs. present & planned)					
Flow Maldistribution in Heat Exchangers, Problems & Opportunities - San Francisco, 1998					
Emerging Technologies-Heat Exchanger Miniaturization - Toronto, 1998					
Flow Visualization of HVAC and Refrigeration Processes - Atlanta, 2001					
MEMs for HVAC/Refrigeration Heat Exchanger and System Miniaturization - Atlanta, 2001					
Flow Maldistribution Issues in Heat Exchangers - Cincinnati, 2001					
TC/TG Sponsored Forums-Title, when presented (past 3 yrs. present & planned)					
JOURNAL PUBLICATIONS, when published (past 3 yrs. present & planned)					

Submitted By: J. W. Larson

**TC/TG SPONSORED SYMPOSIA - TITLE**

**Thermal and Fluid Characteristics in HVAC and Refrigeration Heat Exchanger Processes  
San Francisco, 1998**

**Thermal and Fluid Characteristics in HVAC and Refrigeration Heat Exchanger Processes  
Toronto, 1998**

**Advances in Thermal and Fluid Characteristics in HVAC and Refrigeration Processes  
Chicago, 1999**

**Advances in Thermal and Fluid Characteristics in HVAC and Refrigeration Processes  
Seattle, 1999**

**Advances in Thermal and Fluid Flow Characteristics of HVAC, Refrigeration and AC Process  
Dallas, 2000**

**Heat Exchanger Miniaturization  
Dallas, 2000**

**Advances in Thermal and Fluid Flow Characteristics of HVAC, Refrigeration, and AC Process  
Minneapolis, 2000**

**Use of Computational Fluid Dynamics in Heat Exchanger Design  
Minneapolis, 2000**

**Advances in Thermal and Fluid Flow Characteristics of HVAC, Refrigeration and A/C Process  
Atlanta, 2001**

**Use of Computational Fluid Dynamics in HVAC/Refrigeration Design  
Atlanta, 2001**

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.  
1791 Tullie Circle, N.E./Atlanta, GA 30329  
404-636-8400**

**TC/TG/TRG MINUTES COVER SHEET**

(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG NO.: T.C 8.5 DATE: January 2, 2001

TC/TG/TRG TITLE: Liquid-to-Refrigerant Heat Exchangers

DATE OF MEETING: Monday, June 26, 2000 LOCATION: Minneapolis

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
M. Spatz	'99	R. Laks (CM)	'99	J. Thome
J. Larson	'99	Z. Ayub (M)	'96	J. Bryan
N. Gupte	'96	N. Hanna (M)	'99	K. Brand
M. Ohadi	'98	J. Seyed-Yagoobi (M)	'99	B. McQuade
S. Oza	'98			L. Chamra
J. Huber	'98			J. Meyer
M. Chyu	'96			M. Neshan
K. Oza	'99			S. Westhoff
P. Payvar	'98			M. Wilson
P. Thors	'96			S. Eckels
J. Judge	'99			B. Dingel
Corresponding Members:				J, Hartfield
A. Kriegsmann	'98			M. Nadurath
S. Moeykens	'99			
S. Sherif	'98			
A. Fovargue	'99			
K. Starner	'99			

**DISTRIBUTION:**

ALL MEMBERS OF TC/TG/TRG

RESEARCH & TECHNICAL COMMITTEE CHAIRMEN: Edward B. Gut

TAC SECTION HEAD: Stanley Westhoff

LIAISONS:

Program: Michael Beda Journal: Kimball E. Ferguson

Handbook: \_\_\_\_\_

MANAGER OF TECHNICAL SERVICES: Martin Weiland

MANAGER OF RESEARCH: William W. Seaton

ADDITIONAL DISTRIBUTION: Standards: Claire Ramspeck - Manager

Standards: J. Pietsch, Liaison

Research: G. Yuill, Liaison

Refrigeration: A. Guerra, Liaison

TEGA: William E. Tinsley, Liaison

Special Publications: Joseph A. Driscoll, Liaison