



Shaping Tomorrow's
Built Environment Today

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TO: Patrick Noonan, Chair TC 1.8, pat.noonan@us.knaufinsulation.com
Andre Desjarlais, Research Subcommittee Chair TC 1.8, desjarlais@ornl.gov

CC: Arthur Giesler, 2014-15 Research Liaison Section 1.0, art.giesler@att.net
Shinsuke Kato, 2015-16 Research Liaison, 1.0, kato@iis.u-tokyo.ac.jp

FROM: Michael Vaughn, MORTS, mvaughn@ashrae.org

DATE: July 29, 2015

SUBJECT: Research Topic Acceptance Request (1761-RTAR), "Modeling Heat and Moisture Transport in Mechanical Insulation Systems on Below Ambient Insulated Pipes"

During their recent Annual meeting, the Research Administration Committee (RAC) reviewed the subject Research Topic Acceptance Request (RTAR) and voted 5-0-0 to reject it. The following are the consensus reasons for rejecting this RTAR:

1. Needs detailed review of literature describing the current state-of-the-research in this field.
2. Secure co-funding for this research from manufacturers, and others that will benefit from this research.
3. Detailed technical approach is required. Long-term validation of combined heat and moisture simulation models very challenging. The RTAR mentioned one specific software program and suggests that it is good enough to conduct the research. No evidence was provided, however, for such confidence.

By rejecting this RTAR, RAC is strongly suggesting to the TC that this particular topic be dropped from the TC research plan based on the information that has been provided.

An RTAR evaluation sheet is attached as additional information and it provides a breakdown of comments and questions from individual RAC members based upon specific review criteria. This should give you an idea of how your RTAR is being interpreted and understood by others.

If the TC wishes to pursue this topic further, please address the above issues noted by RAC in a revised version of the RTAR with the help of your new Research Liaison, Shinsuke Kato, RL1@ashrae.net, prior to submitting it to the Manager of Research and Technical Services for further consideration by RAC. In addition, a separate document providing a point by point response to each of these comments and questions must be submitted with the RTAR. The response to each item should explain how the RTAR has been revised to address the comment, or a justification for why the Technical Committee feels a revision is unnecessary or inappropriate. The RTAR and response to these comments and questions must be approved by the Research Liaison prior to submitting it to RAC.

The next submission deadline for RTARs and WSs is **August 15, 2015** for consideration at the RAC 2015 fall meeting. The submission deadline after that is December 15, 2015.

Project ID	1761	
Project Title	Modeling Heat and Moisture Transport in Mechanical Insulation Systems on Below Ambient Insulated Pipes	
Sponsoring TC	TC 1.8 (Mechanical Systems Insulation) Co-sponsored by: TC 1.12 (Moisture Management in Buildings), TC 4.4 (Building Materials and Building Envelope Performance) and TC 10.3 (Refrigerant Piping, Controls, and Accessories)	
Cost / Duration	\$75k / 18M	
Submission History	1st Submission	
Classification: Research or Technology Transfer	Basic/Applied Research	
RAC 2015 Annual Meeting Review		
Essential Criteria	Voted NO	Comments & Suggestions
Background: The RTAR should describe current state of the art with some level of literature review that documents the importance/magnitude of a problem. References should be provided. If not, then note it in your comments.		#1 - No references provided #2 - Believe that TC 1.8 topic 1703 needs to be completed before this RTAR is moved forward. #9 - RTAR does not describe the current state-of-the-art or reference any literature review. #7 - There is no literature review and description of currently available mathematical models to address the simultaneous heat and moisture transfer due to both vapor pressure and thermal gradients. WUFI is not capable of solving the simultaneous heat and moisture transfer in hygroscopic materials. The hygroscopicity in terms of sorption isotherms or water activity is not considered in WUFI models. #8 - Very limited literature background was given, and only referred to one specific software tool.
Research Need: Based on the background provided is the need for additional research clearly identified? If not, then the RTAR should be rejected.		#9 - Very concerned that the Research Need states "It is expected that the results will provide a mathematical method for quantification and prediction of the rate of water vapor permeation into mechanical insulation on below ambient systems, such as chilled water, and provide confidence in that model." Why expected? Shouldn't that be the goal of the project? #7 - Not well established. #15 - It appears that the success of this project is contingent upon the completion of 1646-RP, so I am concerned that it may be premature to move this forward at the moment. #4 - I don't understand how this interacts with RTAR 1703, and ongoing RP-1646 work by the same TCs. #8 - Long-term validation of combined heat and moisture simulation models very challenging. The RTAR mentioned one specific software program and suggests that it is good enough to conduct the research. No evidence was provided, however, for such confidence. Even if this were true, then this project lacks innovation by falling into simulation exercises.
Relevance and Benefits to ASHRAE: Evaluate whether relevance and benefits are clearly explained in terms of: a. Leading to innovations in the field of HVAC & Refrigeration b. Valuable addition to the missing information which will lead to new design guidelines and valuable modifications to standards. Is this research topic appropriate for ASHRAE funding? If not, Reject.		#10 - I FEEL LIKE THIS ONE IS BETTER FUNDED BY THE INSULATION INDUSTRY, OR MAJORITY CO-FUNDED. #9 - RTAR states that the research will produce new and useful methodology...need more detail. #7 - Weak justification about value to ASHRAE. #4 - Category B, valuable information needed for better designs - and better products.
IF ABOVE THREE CRITERIA ARE NOT ALL SATISFIED - MARK "REJECT" BELOW & CONTINUE REVIEW BELOW		
Other Criteria	Voted NO	Comments & Suggestions
Project Objectives: Based on the background and need, evaluate whether the project objectives are: 1. Aligned with the need 2. Specific 3. Clear without ambiguity 4. Achievable If not, then appropriate feedback should be provided.		#15 - well written
Expected Approach and Budget: Is there an adequate description of the approach in order for RAC to be able to evaluate the appropriateness of the budget? If not, then the RTAR should be returned for revision. Anticipated funding level and duration:		#1 - The modelling is to be based on results from RP-1646; however, there is an ongoing debate about the validity of data taken during RP-1646. #15 - The proposed work seems like it may be a small effort to codify and run simulations using the results of RP-1646. This may be a project that could be done as a follow project for a much smaller budget and shorter timeline. #4 - not certain
References: Are the references provided?		#2 - Need references.
Decision Options	Initial Decision?	Final Approval Conditions
ACCEPT AS-IS		#2 - Delay until 1703 is complete. #9 - Why do the research if the results are "expected" to achieve a goal. Also the benefits of the project need to be more clearly defined. #7 - It is not just the missing values of thermal conductivities, which would be obtained from RP 1646, would be enough to conduct this research. Appropriate mathematical models and associated software is not available to perform these analyses. It needs more fundamental development of numerical methods.
ACCEPT W/COMMENTS		
REJECT		

ACCEPT Vote - Topic is ready for development into a work statement (WS).

ACCEPT W/COMMENTS Vote - Minor Revision Required - RL can approve RTAR for development into WS without going back to RAC once TC satisfies RAC's approval condition(s)

REJECT Vote - Topic is not acceptable for the ASHRAE Research Program

DRAFT RTAR Template

Title: _____

Summary

Describe in summary form the proposed research topic, including what is proposed, why this research is important, how it will be conducted, and why ASHRAE should fund it (50 words maximum)

Background

Provide the state of the art with key references (at the end of this document) substantiating it (300 words maximum)

Research Need

Use the state of the art described above as a basis to specify the need for the proposed effort (250 words maximum)

Project Objectives

Based on the identified research need(s), specify the objectives of the solicited effort that will address all or part of these needs (150 words maximum)

Expected Approach

Describe in a manner that may be used for assessment of project viability, cost, and duration, the approach that is expected to achieve the proposed objectives (200 words maximum).

Check all that apply: Lab testing (), Computations (), Surveys (), Field tests (), Analyses and modeling (), Validation efforts (), Other (specify) ()

Relevance and Benefits to ASHRAE

Describe why this effort is of specific interest to ASHRAE, its impact, and how it will benefit ASHRAE and the society. How does it align with ASHRAE Strategic Plans and Initiatives? How does it advance the state of the art in this area in general? Are there other stakeholders that should be approached to obtain relevant information or co-funding? (350 words maximum)

Anticipated Funding Level and Duration

Funding Amount Range: \$ _____

Duration in Months: _____

References

List the key references cited in this RTAR