

**To:** Professor Lefteri H. Tsoukalas, Head of the School of Nuclear Engineering

**From:** The Fact-finding Committee with the Members,

Profs. Chan K. Choi, Franklyn M. Clikeman, and Karl O. Ott

**Date:** Thursday, 23 February 2006

**Subject:** Fact-finding Committee Report

*Franklyn M. Clikeman*  
*Chan K. Choi*  
*Karl O. Ott*

The three-member Fact-finding Committee submits the following report in response to your request dated on February 7, 2006 (see the attached memo from the Head to the Committee) to follow up on the complaints received from within and outside Purdue.

The Committee was charged to inquire about the circumstances surrounding a publication entitled "Bubble Dynamics and Tritium Emission During Bubble Fusion Experiments," by Y. Xu, A. Butt, and S. T. Revankar, which appeared in the conference proceedings of the 11<sup>th</sup> International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-11) in Avignon, France during October 2-6, 2005 (Publication 548) (see attached paper). The Committee was specifically requested to address the issues surrounding the data reported, the method of analysis, the actual authorship and the conclusions stated.

The Committee met five times including two sessions with two out of three authors. Meetings were held on February 9<sup>th</sup>, 15<sup>th</sup> (both with the committee members only), February 17<sup>th</sup> (with the committee members and Mr. A. Butt), February 20<sup>th</sup> (with the committee members and Mr. A. Butt and Dr. Y. Xu), and February 22<sup>nd</sup> (with the committee members only). There were no minutes kept for the ongoing nature of the committee activity. The third author, Prof. S. T. Revankar, did not wish to participate.

The Committee focused on two main issues; i.e., 1) issues related to the experiment, and 2) the issues related with the actual authorship of the said paper and its companion paper entitled "Confirmatory experiments for nuclear emissions during acoustic cavitation," by Yiban Xu and Adam Butt, which appeared in the *Nuclear Engineering and Design (NED)*, 235 (2005) 1317-1324 (see attached paper). The NED publication preceded that of NURETH-11.

The Committee finds the following facts and observations:

- 1) The said experiments were claimed to have been done mostly during February 2004 in the Purdue Pharmacy Building by Dr. Yiban Xu. The Committee finds that the claim is consistent with the Laboratory log book time of the experiments – Feb. to April, 2004 (see attachment). There are speculations about the method of the data analysis and the conclusions stated in NURETH-11 paper but the Committee did not dwell on those issues as they are characteristic to the experimentalists. The Committee noted, however, that both the NED and the NURETH-11 papers described the same experiments and the same results.

- 2) About the actual authorship, the Committee finds that i) Mr. Adam Butt did not make contributions to neither NED paper nor the NURETH-11 paper. Adam was asked by Professor Teleyarkhan to be a co-author with Dr. Xu on the NED paper (see the attached statement from Adam Butt dated 2/23/2006). The NED paper was already written by the time Adam saw it and Adam's name was added to the publication the day before submitting it to the NED editor for review. Adam's input was to grammatically review the paper as well as double check the data being used. Adam also learned his authorship on the NURETH-11 paper a week before the conference when he was first given a copy of the NURETH-11 paper by Professor Teleyarkhan. Professor Teleyarkhan asked Adam to go to France give a presentation on the NURETH-11 paper. Adam was not able to travel to France and Professor Revankar instead presented the NURETH-11 paper. ii) Dr. Yiban Xu stated first that he wrote the NED paper and later he re-stated that he only wrote the first draft copy of the paper. Dr. Xu completed his Ph. D. degree in May, 2004 from the School of Nuclear Engineering from Purdue West Lafayette campus and his Ph. D. thesis is readily available. The Committee noted the drastic departure in the command of English language and the writing style in the NED paper from those in the Ph. D. thesis. Dr. Xu stated that he wrote only a draft version of the manuscript. The Committee followed up with an inquiry as to the actual person(s) who provided the writing assistance. Dr. Xu deferred his answer to be given next day (i.e., by Tuesday, February 21, 2006) but as of this report writing the Committee did not receive any response from Dr. Xu even after having reminded him on this question (see the attached email on February 21, 2006). iii) The Committee attempted to reach Professor Revankar (see attached email sent to his attention on February 21, 2006) but he refused to have a meeting as indicated in his email response (see attached email on February 22, 2006). Professor Revankar is a co-author in the NURETH-11 paper, but not a co-author in the NED paper. The Committee had difficulties in understanding why Professor Revankar did not appear as co-authors in both papers since both papers describe the same experiments and the same results. iv) In reference to the actual authorship and the writing styles of both said manuscripts, the Committee finds surprising similarities in other publications, e.g., "Nuclear Emission During Self-Nucleated Acoustic Cavitation," by R. Teleyarkhan, et al., in *Physical Review Letters*, **96**, 034301 (27 Jan 2006) and "Evidence for Nuclear Emissions During Acoustic Cavitation," by R. Teleyarkhan, et al., in *Science*, **295**, 1868-1873 (8 March 2002) (see attached papers). The Committee has only information on the draft of the NED paper but true authorship could not be determined at this point because Dr. Xu refused to provide the information. Dr. Xu was clearly concerned about disclosing the name of the person who wrote the paper as it could jeopardize, in his own words, the "confirmatory nature" of the experiments.

The Committee concludes its findings and observations with a note that the task was a very delicate matter which involved the colleagues in the School and that maintaining the utmost objectivity was the paramount priority.

Attachments as stated