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Engineering & Scientific Consulting

Michael Acton, Ph.D.

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Professional Profile

Michael Acton's expertise is in computational fluid dynamics (CFD), heat transfer, and fluid flow. Applications of his experience include evaluating steam generator designs, predicting skin temperatures in enclosed environments, calculation of heat loss in buried pipeline systems, studying carbon monoxide (CO) exposures, and evaluating radiative heat transfer exposure to human skin. He also has experience in statistics, data analysis and visualization, and numerical modeling.

Prior to joining Exponent, Michael worked as a PhD candidate in the Nuclear Science and Engineering Department at the Massachusetts Institute of Technology. There he developed a novel CFD uncertainty quantification technique for usage in nuclear reactor safety analysis and licensing. During this process he utilized statistical data analysis, numerical techniques, and physical fluid dynamics modeling to determine the accuracy of CFD for a wide variety of flow conditions. He also studied the usage of advanced CFD turbulence models for the prediction of thermal stresses and complex fluid mixing in sodium cooled nuclear reactor designs and developed an analysis technique for use by the nuclear industry. Michael's experience also includes flow modeling of helical coil steam generators, pressurized water reactor flow channels, and natural convection conditions.

Academic Credentials & Professional Honors

Ph.D., Nuclear Science and Engineering, Massachusetts Institute of Technology (MIT), 2020

M.S., Nuclear Science and Engineering, Massachusetts Institute of Technology (MIT), 2016

B.S., Nuclear Engineering, Missouri University of Science and Technology, 2014

Professional Affiliations

American Nuclear Society (ANS)

Alpha Nu Sigma National Honor Society

Phi Kappa Phi National Honor Society

Publications

Martinez J, Merzari E, Acton M, Baglietto E. Direct numerical simulation of turbulent flow inside a differentially heated composite cavity. Nuclear Technology. 2019

Presentations

Acton M, Baglietto E. Addressing the usage of CFD within the CSAU framework for nuclear reactor safety analysis simulations. 18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Portland, OR, August 18 - 23, 2019.

Feng J, Acton M, Baglietto E, Kraus A, Merzari E. Evaluation of turbulence modeling approaches for the prediction of cross-flow in a helical tube bundle. 18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Portland, OR, August 18 - 23, 2019.

Acton M. Predictive turbulence model uncertainty quantification for industrial CFD simulation. Siemens Energy & Process Simulation Symposium, Houston, TX May 21 - 22, 2019.

Acton M, Lenci G, Baglietto E. Structure-Based resolution of turbulence for sodium thermal striping applications. 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Chicago, IL, August 30 - September 4, 2015.